

2.3 BIOLOGICAL ENVIRONMENT

2.3.1 NATURAL COMMUNITIES

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in **Section 2.3.5, Threatened and Endangered Species**. Wetlands and other waters are also discussed below in **Section 2.3.2, Wetlands and Other Waters**.

AFFECTED ENVIRONMENT

The following analysis is based on the Natural Environment Study (NES) prepared for the project (Caltrans, 2014k).

The biological study area (BSA) for the project includes the physical footprint of the Build Alternative, including all areas where ground disturbance would occur from the construction of the proposed improvements (e.g., construction staging areas, demolition, earthmoving activities, etc.), areas of right-of-way to be obtained for the project, and temporary access areas. The BSA was defined to also include the areas of indirect potential effects that may occur outside of the direct physical footprint of the Build Alternative. **Appendix H** illustrates the limits of the BSA for the Build Alternative.

The BSA does not extend far beyond the project limits, thus the majority of the land within the BSA is disturbed or developed. The BSA totals 778.13 acres, of which the majority is disturbed or developed. In general, the BSA runs within approximately 20 miles of Caltrans state right-of-way associated with the I-80 corridor, from just west of Red Top Road to east of the intersection of I-80 and I-505 (post mile 10.2 to 30.4). Formal studies of biological resources within the BSA were conducted on the following listed survey dates:

- Botanical surveys conducted between September 2011, March 2012, May 2012, March 2013, May 2013, and August 2013, served as reconnaissance to map vegetation and identify suitable habitat for special-status plant species in the BSA. The results were used to inform the specific timing and locations for subsequent botanical surveys.
- Multiple field investigations were conducted from April to June and August to September in 2011 to delineate potential waters of the U.S., including wetlands and water features.
- Large branchiopod surveys were conducted from March 2012 to April 2013.

- Bat assessments were conducted in August 2011 at each bridge and crossing within the BSA.
- A habitat assessment for anadromous fish was conducted in 2012.
- A protocol-level site assessment for the California tiger salamander (*Ambystoma californiense*) was conducted in August 2013.
- Protocol-level California red-legged frog (*Rana draytonii*) surveys were conducted in August 2013.
- Reconnaissance level surveys for the Swainson's hawk (*Buteo swainsoni*) were conducted in April 2012.
- Multiple tree surveys were conducted in September 2011 and between October and December 2011.

Subsequent to the completion of biological field surveys conducted in 2011 and 2012, the project limits were extended 1 mile in each direction to accommodate changes to entrance and exit signage, and to facilitate utility connections. Each survey was reviewed upon changes to the project limits, and additional surveys were performed in 2013, if necessary. All acreages (e.g., impact areas and land cover types) discussed in this section reflect the current project limits.

There are 14 habitat types in the BSA. Of the various habitats present within the BSA, oak woodlands, riparian woodlands, mixed oak woodlands, and wetlands are considered sensitive habitat types. Impacts to four types of aquatic and wetland habitats are discussed in **Section 2.3.2, Wetlands and Other Waters**, which discusses jurisdictional wetlands and other waters within the BSA.

Table 2.3-1 lists the remaining ten land use communities present within the BSA. **Appendix H** illustrates the distribution of the natural communities within the BSA. Principal characteristics and general locations of these communities as they exist within the BSA are described below. The vegetation types identified within the BSA support a variety of wildlife species, including mammals, birds, amphibians, reptiles, and fishes. Marsh habitats can provide habitat for fish nurseries, amphibians, aquatic reptiles, wading birds, waterfowl, and songbirds. Riparian woodland can provide foraging, roosting, and nesting habitat for a variety of birds and provide cover and refuge sites for small mammals, amphibians, and reptiles. Detailed descriptions of each habitat and vegetation mapping are described in greater detail in the NES.

Table 2.3-1 Land Cover Types within the BSA

Land Cover Type	Total Area within BSA (acres)
West Segment	
Non-Native Annual Grassland	39.72
Landscaped	25.18
Ruderal	22.47
Barren	14.79
Mixed Oak Woodland	0.89
Riparian Woodland	0.26
Eucalyptus Grove	4.44
Row Crops	0.58
Coyote Brush Scrub	0.22
Developed	238.45
West Segment Total	347.00
East Segment	
Non-Native Annual Grassland	68.33
Landscaped	39.05
Ruderal	39.64
Barren	2.32
Mixed Oak Woodland	14.90
Riparian Woodland	3.31
Eucalyptus Grove	5.02
Row Crops	3.13
Coyote Brush Scrub	2.84
Developed	239.75
East Segment Total	418.29
Build Alternative	
Non-Native Annual Grassland	108.05
Landscaped	64.23
Ruderal	62.11
Barren	17.11
Mixed Oak Woodland	15.79
Riparian Woodland	3.57
Eucalyptus Grove	9.46
Row Crops	3.71
Coyote Brush Scrub	3.06
Developed	478.20
Total Build Alternative	765.29

Source: Caltrans, 2014k

Non-Native Annual Grassland

Vegetation

Non-native grassland occurs in small patches throughout the BSA and is the dominant vegetation type within the BSA abundant habitat types. Non-native grassland is generally dominated by exotic annual grasses and forbs including wild oats (*Avena fatua*), soft chess (*Bromus hordeaceus*), ripgut brome (*Bromus diandrus*), Italian ryegrass (*Festuca perennis*), yellow star-thistle (*Centaurea solstitialis*), hare barley (*Hordeum murinum* ssp. *leporinum*), medusa-head grass (*Elymus caput-medusae*), mustards (*Brassica* spp.), and filarees (*Erodium* spp.). Occasional native species are also present, but less dominant than non-native species. These include the blue wildrye (*Elymus glaucus*) and California poppy (*Eschscholzia californica*).

Wildlife in Grassland Habitat

Grasslands lack the structural diversity necessary to support a high diversity of wildlife species, but are used as foraging, burrowing, and nesting locations by moderate numbers of wildlife species. Annual grassland habitat in the BSA is used by reptiles and amphibians such as the western fence lizard (*Sceloporus occidentalis*), western skink (*Eumeces skiltonianus*), and western toad (*Anaxyrus boreas*) that feed on invertebrates found within and beneath debris in the vegetation. Insect and seed eating birds, including the western scrub-jay (*Aphelocoma californica*), barn swallow (*Hirundo rustica*), northern mockingbird (*Mimus polyglottos*), mourning dove (*Zenaida macroura*), golden-crowned sparrow (*Zonotrichia atricapilla*), and white-crowned sparrow (*Zonotrichia leucophrys*), also use this habitat for foraging, and the scattered trees provide nesting habitat. A number of mammal species, including the deer mouse (*Peromyscus maniculatus*), Botta's pocket gopher (*Thomomys bottae*), and black-tailed hare (*Lepus californicus*), forage and nest within these grasslands. These mammals also attract predatory wildlife including the gopher snake (*Pituophis catenifer*), American kestrel (*Falco sparverius*), red-tailed hawk (*Buteo jamaicensis*), and gray fox (*Urocyon cinereoargenteus*).

Landscaped

Vegetation

Landscaped areas occur throughout the BSA in close association with existing development. These areas have been impacted by grading, mowing, filling, and urban uses. Landscaped areas include irrigated lawns as well as ornamental trees and shrubs. In some cases, landscaping includes planted native trees such as the California sycamore (*Platanus racemosa*), Fremont's cottonwood (*Populus fremontii*), bishop pine (*Pinus muricata*), and Monterey cypress (*Hesperocyparis macrocarpa*).

Wildlife in Landscaped Habitat

The landscaped areas within the BSA are frequently disturbed, and are used only by the most disturbance-tolerant wildlife species. The species that are found here are often introduced, non-natives such as rock pigeons (*Columba livia*), European starlings (*Sturnus vulgaris*), and house sparrows (*Passer domesticus*). Other species occurring within landscaped habitat include mourning doves, Brewer's blackbirds (*Euphagus cyanocephalus*), killdeer (*Charadrius vociferus*), and northern mockingbirds.

Ruderal*Vegetation*

Ruderal habitat is generally dominated by non-native species that are able to rapidly colonize and establish on recently disturbed soil. Ruderal habitat occurs in numerous small patches along the roadside in the BSA. Typical dominant vegetation in these areas includes winter vetch (*Vicia villosa*), Italian thistle (*Carduus pycnocephalus*), milk thistle (*Silybum maritimum*), filarees, prickly sow-thistle (*Sonchus asper*), riggut brome, wild radish (*Raphanus sativus*), mustards (*Brassica* spp.), bur-clover (*Medicago polymorpha*), and horseweed (*Conyza canadensis*).

Wildlife in Ruderal Habitat

Wildlife species found in ruderal areas are typically those species found in developed habitats and that use adjacent ruderal areas for foraging and moving. Common wildlife species found in ruderal habitats include western fence lizards, killdeer, house finches (*Haemorhous mexicanus*), western meadowlarks (*Sturnella neglecta*), red-winged blackbirds (*Agelaius phoeniceus*), American goldfinches (*Carduelis tristis*), mourning doves, house mice (*Mus musculus*), black-tailed hares, and California ground squirrels (*Spermophilus beecheyi*).

Barren*Vegetation*

In the BSA, barren habitat typically occurs along roadsides and in other areas that experience frequent, heavy disturbance. Although these areas are not covered in hardscape (i.e. asphalt or concrete), the soil is either heavily compacted or covered in gravel which prohibits the growth of most plant species. Total plant cover in these areas is less than five percent.

Wildlife in Barren Habitat

Barren habitat provides few resources to wildlife species. Although some species associated with adjacent habitats likely forage on the soil of the barren habitat to some extent, use of this habitat by wildlife is expected to be limited.

Mixed Oak Woodland

Vegetation

Mixed oak woodland often occurs along riparian corridors within the BSA, but can also occur in upland settings away from stream and creek channels. This habitat is generally co-dominated by valley oak (*Quercus lobata*), coast live oak (*Quercus agrifolia*), and interior live oak (*Quercus wislizenii* var. *wislizenii*). Other common native species include elderberry (*Sambucus nigra*), California buckeye, and poison oak (*Toxicodendron diversilobum*). The understory of the mixed oak woodland habitat is generally composed of non-native annual grassland.

Wildlife in Mixed Oak Woodland Habitat

Mixed oak woodland habitat can support diverse animal communities in California. Both valley and coast live oaks in this habitat provide shelter for wildlife in the form of cavities, bark crevices, and complex branching growth, as well as abundant food resources, including nuts and invertebrates. Leaf litter and fallen logs in the mixed oak woodland may provide cover and foraging habitat for California slender salamanders (*Batrachoseps attenuatus*), western fence lizards, and other common reptiles. Common bird species in the mixed oak woodland includes the Anna's hummingbird (*Calypte anna*), Nuttall's woodpecker (*Picoides nuttallii*), western scrub-jay, violet-green swallow (*Tachycineta thalassina*), chestnut-backed chickadee (*Poecile rufescens*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), dark-eyed junco (*Junco hyemalis*), house finch, and lesser goldfinch (*Spinus psaltria*). Medium-sized urban-associated mammals such as raccoons (*Procyon lotor*) and striped skunks (*Mephitis mephitis*) are also expected to frequent this habitat type. Several species of bats, including the California myotis (*Myotis californicus*) and western red bat (*Lasiurus blossevillii*), may roost in small numbers in the larger trees within the BSA.

Riparian Woodland

Vegetation

Riparian woodland occurs along stream and creek channels within the BSA. The riparian woodlands support a relatively diverse assemblage of native trees and shrubs including valley oak, coast live oak, willows (*Salix* spp.), California bay (*Umbellularia californica*), Fremont's cottonwood, Oregon ash (*Fraxinus latifolia*), California buckeye, and elderberry. The understory is composed of a mix of native and non-native grasses, forbs, and woody vines. Common native species include mugwort (*Artemisia douglasiana*), California wild rose (*Rosa californica*), poison oak, and California wild grape (*Vitis californica*). Common non-native species include Himalayan blackberry (*Rubus armeniacus*), as well as a variety of exotic grasses and forbs similar to those observed in non-native grassland.

Wildlife in Riparian Woodland Habitat

Riparian habitats in California generally support exceptionally rich animal communities and contribute a disproportionately high amount to landscape-level species diversity. The oaks, willows, and cottonwoods in the riparian woodlands attract a number of avian species to this habitat. Some of these species are resident year-round, breeding in the riparian habitat in spring and summer and using it for cover and foraging during the non-breeding season. Common bird species nesting and foraging in this habitat include the chestnut-backed chickadee, bushtit, oak titmouse (*Baeolophus inornatus*), downy woodpecker (*Picoides pubescens*), Bewick's wren, spotted towhee (*Pipilo maculatus*), and song sparrow (*Melospiza melodia*). Raptors, such as red-shouldered hawks (*Buteo lineatus*) and Cooper's hawks (*Accipiter cooperii*), may nest within the riparian woodland in the BSA and forage in adjacent habitats year round.

A number of species of reptiles and amphibians occur in the leaf litter, downed tree branches, and fallen logs of this habitat. These include the arboreal salamander (*Aneides lugubris*), western toad, and Sierran chorus frog (*Pseudacris sierra*), western fence lizard, western skink, and southern alligator lizard (*Elgaria multicarinata*). Small mammals such as ornate shrews (*Sorex ornatus*), California voles (*Microtus californicus*), and western grey squirrels (*Sciurus griseus*) and medium-sized mammals such as raccoons, striped skunks, and non-native opossums (*Didelphis virginianus*) are common, urban-adapted species present in the riparian woodland habitat.

Eucalyptus Grove

Vegetation

Eucalyptus grove habitat occurs in many small patches in the BSA. Eucalyptus trees are non-native and have been planted for a variety of purposes, most commonly as windbreaks. The eucalyptus groves in the BSA are dominated by one or more eucalyptus tree species including blue gum (*Eucalyptus globulus*) and red gum (*Eucalyptus camaldulensis*). The understory is sparsely vegetated and dominated by leaf and bark litter in dense groves, and non-native grassland species where there are larger canopy gaps.

Wildlife in Eucalyptus Grove Habitat

The eucalyptus grove habitats in the BSA support many common species of amphibians, reptiles, birds, and mammals. Although most of these species are expected to be less common, a few, such as the Anna's hummingbird and the yellow-rumped warbler (*Setophaga coronata*), may be seasonally common in this habitat. In addition, these trees may be used as nesting sites by raptors such as the white-tailed kite (*Elanus leucurus*) and red-shouldered hawk. Bird and mammal species associated with low, dense vegetation are expected to be rare in, or absent from, the eucalyptus grove habitat.

Row Crops

Vegetation

The BSA encroaches upon the edges of agricultural fields located on the westbound side of I-80, near the Cherry Glen Road intersection. Areas mapped as row crops are routinely plowed/disked and support agricultural crops on a seasonal basis. When fallow, these areas support a plant community similar to that described for ruderal habitats above.

Wildlife in Row Crops

The row crop habitat in the BSA provides wildlife habitat similar to that found in the non-native grassland discussed above. The major difference is that the periodic disking¹ associated with the agricultural areas in the BSA disrupts burrows and other refugia for reptiles, rodents, and other small animals. Efficient burrowers such as California ground squirrels are capable of recolonizing these habitats after the disturbance has passed. These colonizations are usually limited to the peripheries of the fields.

Coyote Brush Scrub

Vegetation

Coyote brush scrub habitat typically occurs within non-native grassland and is generally transitional between woodland and grassland habitat types in the BSA. Coyote brush can grow approximately 10 feet tall and has evergreen leaves. This habitat is dominated by coyote brush (*Baccharis pilularis*) with a non-native grasslands understory and scattered poison oak shrubs.

Wildlife in Coyote Brush Scrub Habitat

Coyote brush scrub habitats are typically dry and provide relatively low and homogeneous vegetative structure resulting in low wildlife species diversity. In the BSA, coyote scrub habitat is restricted and surrounded by grassland and developed habitats resulting in the occasional use of this habitat type by wildlife species that occur in the adjacent habitats. Amphibians are usually absent or scarce in coyote brush scrub habitat due to the very dry conditions. Mammals that use the northern coyote brush scrub habitats for foraging and cover include the coyote (*Canis latrans*), bobcat (*Lynx rufus*), and brush rabbit (*Sylvilagus bachmani*), among others. Bird species that nest in coyote brush scrub habitats include the western scrub-jay, California thrasher (*Toxostoma redivivum*), California towhee (*Melospiza crissalis*), spotted towhee, California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), and Anna's hummingbird. Reptiles that occur in these habitats include the gopher snake, southern alligator lizard, and western fence lizard.

¹ Agricultural technique to laterally displace and invert soil through the use of concave steel disk blades.

Developed

Vegetation

Developed areas are the predominant land use type within the BSA and include all paved surfaces including roadways, parking lots, and structures.

Wildlife in Developed Areas

Paved roadways in developed areas do not provide high-quality wildlife habitat. However, snakes and lizards may bask on road surfaces, and a wide variety of wildlife cross or move along the road en route to other habitats. Bridges can function as sheltering habitat for an assortment of wildlife species. Crevices found within bridges provide protection from inclement weather as well as from potential predators, and can encourage their use as nesting habitat. Eight of the seventeen bridges/culverts within the BSA were determined to provide suitable day roosting and/or night roosting habitat for bats, including the Yuma myotis (*Myotis yumanensis*) and nesting birds such as cliff swallows (*Petrochelidon pyrrhonota*) and black phoebes (*Sayornis nigricans*).

Wildlife Corridors

The existing traffic lanes of the I-80 corridor currently present a substantial passage impediment to smaller, less mobile animals and partial passage impediment to larger, more, mobile animals within the BSA. Less mobile animals include reptiles such as the western pond turtle, amphibians such as the California red-legged frog, and rodents. Larger and more mobile animals include birds such as the burrowing owl and Swainson's hawk and mammals such as the American badger. However, there are several creek crossings and underpass structures, in both the West and East Segments, which provide potential pathways for animal passage across I-80. The current condition of existing wildlife corridors (including fish passage for federally listed species) within the BSA is discussed in greater detail under **Section 2.3.4, Animal Species**, and **Section 2.3.5, Threatened and Endangered Species**, as it pertains to specific sensitive and/or special-status animal species.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The temporary and permanent effects of the Build Alternative to the different habitat types within the BSA are shown in **Table 2.3-2**, which identifies the temporary and permanent impacts of the Build Alternative to each natural community. Project effects that are considered temporary include the use of areas of habitat as staging areas and temporary construction access areas.

The West Segment boundaries overlap the boundaries of two other projects for which Caltrans also led the environmental compliance efforts; the I-80/I-680/SR-12 Interchange Project Phase 1 initiated in the spring of 2014 and the Truck Scales project completed in

2013. To avoid redundant environmental compliance efforts, wherever the project anticipated an overlap with impact areas identified in the I-80/I-680/SR-12 Interchange project Phase 1 or Truck Scales projects, the following methods were applied:

- Permanent Impacts. I-80 Express Lanes Project impact areas that overlap with the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales permanent impact areas are not counted as I-80 Express Lanes Project impacts.
- Temporary Impacts. I-80 Express Lanes Project impacts that would spatially overlap with the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales temporary impact areas are counted as I-80 Express Lanes project impacts.

Thus, it is noted that **Table 2.3-2** and **Table 2.3-3** (see **Section 2.3.2, Wetlands and Other Waters**) summarize the project's temporary and permanent impacts on habitat/land cover types within the BSA, including those impacts already mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 or Truck Scales projects.

Table 2.3-2 includes isolated calculations for the West Segment and East Segment of the Build Alternative. In total, the Build Alternative would result in permanent impacts to approximately 1.35 acres of mixed oak woodlands, all of which would be affected within the East Segment. Permanent impacts to approximately 0.03 acre of riparian woodland would also occur; 0.01 acre in the West Segment and 0.02 acre in the East Segment.

Compensatory mitigation will be required for impacts of mixed oak woodlands as mitigation for state and federally listed species (see **Section 2.3.5**) and for riparian habitat.

Adverse effects related to wetlands and other waters of the U.S., including riparian woodlands and freshwater marsh habitat, are discussed in **Section 2.3.2, Wetlands and Other Waters**. Adverse effects related to special-status plant and animal species associated with the remaining habitat types of the BSA are discussed in **Sections 2.3.3, Plant Species; 2.3.4, Animal Species; and 2.3.5, Threatened and Endangered Species**.

West Segment –Fundable First Phase

Construction of the West Segment of the Build Alternative would result in approximately 0.01 acre of direct impacts to riparian woodlands and no direct impacts to mixed oak woodlands within the BSA.

The effects to the remaining habitat types within the BSA of the construction of the West Segment of the Build Alternative are listed in **Table 2.3-2**, and are discussed in greater detail in the subsequent sections of this analysis.

Table 2.3-2 Impacts to Land Cover Types within the BSA

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
West Segment					
Non-Native Annual Grassland	2.82	0.07	2.89	1.57	0.05
Landscaped	3.39	0.22	3.61	3.39	0.22
Ruderal	2.56	0.12	2.68	2.49	0.10
Barren	2.30	0.07	2.37	1.75	0.02
Mixed Oak Woodland	0.00	0.00	0.00	0.00	0.00
Riparian Woodland	0.00	0.01	0.01	0.00	0.01
Eucalyptus Grove	0.26	0.00	0.26	0.25	0.00
Row Crops	0.00	0.00	0	0.00	0.00
Coyote Brush Scrub	0.03	0.01	0.04	0.03	0.01
Developed	10.90	0.80	11.7	6.21	0.65
West Segment Total	22.58	1.31	23.89	15.69	1.06
East Segment					
Non-Native Annual Grassland	8.46	2.6	11.06	_ ²	_ ²
Landscaped	4.41	9.88	14.29	_ ²	_ ²
Ruderal	7.42	4.68	12.1	_ ²	_ ²
Barren	1.14	0	1.14	_ ²	_ ²
Mixed Oak Woodland	0.00	1.35	1.35	_ ²	_ ²
Riparian Woodland	0.00	0.02	0.02	_ ²	_ ²
Eucalyptus Grove	0.83	0.14	0.97	_ ²	_ ²
Row Crops	0.00	0.00	0.00	_ ²	_ ²
Coyote Brush Scrub	0.03	0.00	0.03	_ ²	_ ²
Developed	4.42	9.16	13.58	_ ²	_ ²
East Segment Total	27.66	27.99	55.65	_ ²	_ ²
Build Alternative					
Non-Native Annual Grassland	11.28	2.67	13.95	10.03	2.65
Landscaped	7.80	10.10	17.9	7.80	10.10
Ruderal	9.98	4.80	14.78	9.92	4.78

Land Cover Type	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
Barren	3.44	0.07	3.51	2.90	0.03
Mixed Oak Woodland	0.00	1.35	1.35	0.00	1.35
Riparian Woodland	0.00	0.03	0.03	0.00	0.03
Eucalyptus Grove	1.09	0.14	1.23	1.09	0.14
Row Crops	0.00	0.00	0	0.00	0.00
Coyote Brush Scrub	0.06	0.01	0.07	0.06	0.01
Developed	15.32	9.96	25.28	10.63	9.81
Total Build Alternative	48.97	29.30	79.54	42.43	28.90

Note¹: Project impact area less overlapping permanent impact areas mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales projects.

Note²: Temporary and permanent impacts not previously mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales project do not overlap with the East Segment.

Source: Caltrans, 2014k

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes would be repurposed or constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to habitat types within the BSA. Adverse effects to riparian woodlands and mixed oak woodlands in areas outside of the BSA would be determined under separate environmental review and environmental permitting from regulatory agencies.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Avoidance, minimization, and/or mitigation measures specific to wetlands and other waters of the U.S., including riparian woodlands and aquatic and wetland habitat, are discussed in **Section 2.3.2, Wetlands and Other Waters**. Measures specific to adverse effects to special-status plant and animal species associated with the natural communities of the BSA are discussed in **Sections 2.3.3, Plant Species; 2.3.4, Animal Species; and 2.3.5, Threatened and Endangered Species**.

Mitigation Measure BIO-A: Compensatory Mitigation for Oak Woodlands – Replacement. Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and

density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.

Mitigation Measure BIO-B: Compensatory Mitigation for Oak Woodlands – Habitat Mitigation and Monitoring Plan. Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items:

- Habitat impacts summary and proposed habitat mitigation actions
- Goals of the restoration to achieve no net loss
- The location of the mitigation sites and existing site conditions
- Mitigation design including:
 - Proposed site construction schedule
 - Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability
 - Site preparation and grading plan
 - Invasive species eradication plan, if applicable
 - Soil amendments and other site preparation
 - Planting plan (plant procurement/propagation/installation)
 - Maintenance plan
 - Monitoring measures, performance and success criteria
 - Monitoring methods, duration, and schedule
 - Contingency measures and remedial actions
 - Reporting measures

This mitigation will be deemed complete and Caltrans released from further responsibilities when the final success criteria have been met as determined by applicable regulatory/resource agencies.

Avoidance measures would also avoid or minimize impacts to oak woodlands within the BSA (**Measure BIO-1**). **Mitigation Measures BIO-A** and **BIO-B** would reduce effects to Oak Woodlands.

2.3.2 WETLANDS AND OTHER WATERS

REGULATORY SETTING

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (CWA) (33 United States Code [USC] 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers (USACE) with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

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

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of USACE's Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (U.S. EPA 40 Code of Federal Regulations [CFR] Part 230), and whether permit approval is in the public interest. The 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally

damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this EO states that a federal agency, such as the Federal Highway Administration (FHWA) and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Boards (RWQCB), and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities that may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. See **Section 2.2.2, Water Quality and Storm Water Runoff**, for additional details.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans 2014k). Field investigations were conducted in 2011 and 2013 to preliminarily delineate jurisdictional wetlands and other waters of the U.S., which are regulated by the USACE, and other federal waters of the State regulated by the RWQCB and CDFW. The delineations were conducted in accordance with USACE guidance. **Table 2.3-3** summarizes the potential jurisdictional waters within the BSA by feature type.

The jurisdictions of individual features as discussed in this section have not yet been officially verified by the USACE. The Preliminary Determination of Jurisdictional Waters was sent by Caltrans to the USACE on October 29, 2014 and is included as **Appendix L**. A wetland

verification site visit will be attended by USACE and Caltrans during the next project phase (PS&E) for official verification. If the delineated wetlands are determined to be USACE-jurisdictional, impacts to these wetlands due to project-related activities are likely to require a Section 404 permit issued by the USACE (a Regional or Nationwide General Permit if possible; an Individual Permit only if a General is not possible). However, wetlands determined to be isolated wetlands, and not USACE-jurisdictional, remain potentially State jurisdictional since isolated waters are considered waters of the State.

The vast majority of wetlands and aquatic habitats providing important ecological functions and values within the BSA are considered jurisdictional waters of the U.S. by the USACE, including all perennial drainages. However, some seasonal drainages and wetlands in the BSA may not be considered waters of the U.S. by the USACE because they have no hydrological connection, although this determination ultimately will be made by the USACE during the PS&E phase of the project. **Table 2.3-4** summarizes impacts to wetlands and waters by feature type as they relate to permitting needs, which are described in more detail in *Permitting*.

Table 2.3-3 Wetlands and Water Features Affected by the Build Alternative

Aquatic Habitat	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
West Segment						
Perennial Wetland	0.51	0.00	0.00	0	0.00	0.00
Seasonal Wetland	1.12	0.00	0.01	0.01	0.00	0.00
Perennial Drainage	0.54	0.00	0.00	0	0.00	0.00
Seasonal Drainage	2.29	0.32	0.00	0.32	0.31	0.00
West Segment Total	4.46	0.32	0.01	0.33	0.31	0.00
East Segment						
Perennial Wetland	1.24	0	0.06	0.06	²	²
Seasonal Wetland	0.58	0	0.01	0.01	²	²
Perennial Drainage	3.44	0.38	0.03	0.41	²	²
Seasonal Drainage	3.12	0.54	0.06	0.6	²	²
East Segment Total	8.38	0.92	0.16	1.08	²	²
Build Alternative						
Perennial Wetland	1.75	0.00	0.06	0.06	0.00	0.06
Seasonal Wetland	1.70	0.00	0.02	0.02	0.00	0.02

Aquatic Habitat	Total Area within BSA (acres)	Temporary Impacts (acres)	Permanent Impacts (acres)	Total Impacts (acres)	Temporary Impacts – Not Previously Mitigated ¹ (acres)	Permanent Impacts – Not Previously Mitigated ¹ (acres)
Perennial Drainage	3.98	0.38	0.03	0.41	0.38	0.03
Seasonal Drainage	5.41	0.86	0.06	0.92	0.85	0.06
Total Build Alternative	12.84	1.24	0.17	1.41	1.23	0.17

Note¹: Project impact area less overlapping permanent impact areas mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales projects.

Note²: Temporary and permanent impacts not previously mitigated by the I-80/I-680/SR-12 Interchange Project Phase 1 and Truck Scales project do not overlap with the East Segment.

Source: Caltrans 2014k

Within the BSA, there are 12.84 acres of aquatic habitats, which includes 1.75 acres of perennial wetlands, 1.70 acres of seasonal wetlands, 3.98 acres of perennial drainages, and 5.41 acres of seasonal drainages. Perennial wetlands occur within the low-flow channel of six drainages as well as two marshes that are outside of these drainages. In addition, 10 perennial drainages occur within the BSA. Seasonal wetlands and seasonal drainages are scattered throughout the BSA. The different types of wetlands and drainages and their locations are described further below.

Table 2.3-4 Impacts to Wetlands and Water Features by Permit Requirement

Aquatic Habitat	Temporary Impacts (acres)			Permanent Impacts (acres)		
	Non-jurisdictional	State & Federal ¹	1602 ²	Non-jurisdictional	State & Federal ¹	1602 ²
Perennial Wetland	0.00	0.00	0.00	0.00	0.00	0.06
Seasonal Wetland	0.00	0.00	0.00	0.00	0.02	0.00
Perennial Drainage	0.00	0.00	0.38	0.00	0.00	0.03
Seasonal Drainage	0.12	0.74	0.00	0.00	0.06	0.00
Total	0.12	0.74	0.38	0.00	0.08	0.09

Note¹: Features that are expected to be considered jurisdictional by both the State and the USACE but would not need a 1602 permit. These may require a Section 404 permit from USACE and Section 401 Water Quality Certification from the State. Refer to *Permitting* section for further description of these requirements.

Note²: Features that are expected to be considered jurisdictional and require a Section 1602 permit.

Source: Caltrans, 2014k

Perennial Wetland

Perennial wetland habitat includes areas mapped as perennial wetland, perennial drainage, or perennial marsh. Perennial marsh occurs within the following drainages in the BSA:

- Green Valley Creek

- Dan Wilson Creek
- an unnamed drainage ditch between Holiday Lane and I-80, just west of the intersection with Alvarado Court
- an unnamed drainage ditch between Hillborn Road and I-80
- an unnamed drainage ditch north of the I-80W off-ramp to Hickory Lane
- drainage ditches in the cloverleaf east of the intersection of I-80 and North Texas Street

These areas support perennial or near perennial surface water and are dominated by emergent perennial hydrophytes including cattails (*Typha* spp.), and hardstem bulrush (*Schoenoplectus acutus*). Other common species include giant horsetail (*Equisetum telmateia* ssp. *braunii*), water plantain (*Alisma plantago-aquatica*), and water pepper (*Persicaria hydropiperoides*). In addition, the following two perennial marsh wetlands occur in the BSA:

- between I-80 and Nelson Road, west of the intersection with Lagoon Valley Road
- in the cloverleaf west of the intersection of I-80 and Leisure Town Road

Wildlife in Perennial Wetlands

Perennial wetlands provide habitat for numerous bird species, including ducks, herons, egrets, and other waterbirds. American coots (*Fulica americana*), pied-billed grebes (*Podilymbus podiceps*), and several species of ducks breed in freshwater wetlands in and around emergent vegetation. Perching bird species that breed in freshwater marshes include the marsh wren (*Cistothorus palustris*), song sparrow, common yellowthroat (*Geothlypis trichas*), and red-winged blackbird (*Agelaius phoeniceus*). Amphibians such as the native Sierran chorus frog and western toad, as well as the non-native American bullfrog (*Lithobates catesbeianus*), are also present in these habitats.

Seasonal Wetland

Vegetation

Seasonal wetlands are scattered throughout the BSA. These features are often located in close proximity to existing development and in some cases may be supported by runoff from developed areas. Due to their proximity to development, these wetlands include a mix of both native and non-native plants. Dominant native plants include common spikerush (*Eleocharis macrostachya*), iris leaf rush (*Juncus xiphioides*), balticus rush (*Juncus balticus*), and tall flatsedge (*Cyperus eragrostis*). Dominant, non-native plants include dallisgrass (*Paspalum dilatatum*), Italian ryegrass (*Festuca perennis*), rabbits-foot grass (*Polypogon monspeliensis*), and Bermuda grass (*Cynodon dactylon*). Other commonly observed species include curly dock (*Rumex crispus*), bristly ox-tongue (*Helminthotheca echioides*), birds-foot trefoil (*Lotus corniculatus*), teasel (*Dipsacus fullonum*), and alkali mallow (*Malvella leprosa*).

Wildlife in Seasonal Wetlands

Wildlife species found in seasonal wetlands include the same bird and amphibian species detailed in the ***Wildlife in Perennial Wetlands*** discussion above.

Perennial Drainage

Vegetation

Perennial drainage habitat in the BSA is generally unvegetated and supports perennial flows in a normal rainfall year. The following areas provide perennial drainage habitat:

- Alamo Creek
- Dan Wilson Creek
- Horse Creek
- Laguna Creek
- Ledge wood Creek
- Pine Tree Creek
- Suisun Creek
- Ulatis Creek
- Unnamed perennial drainage 1
- Unnamed perennial drainage 2

Wildlife in Perennial Drainage

Amphibians such as the western toad, Sierran chorus frog, and bullfrog are present in the perennial drainages in the BSA. The native western pond turtle (*Actinemys marmorata*) may also be present in perennial drainages. Waterbirds, such as the mallard (*Anas platyrhynchos*), green heron (*Butorides virescens*), great egret (*Ardea alba*), and belted kingfisher (*Megaceryle alcyon*), forage in these waters, and bats, including the Yuma myotis and big brown bat (*Eptesicus fuscus*), forage aerially on insects over these channels. A number of fish also use the creek and stream channels in the watershed, including several species of native fishes such as hardhead (*Mylopharodon conocephalus*), Sacramento pikeminnow (*Ptychocheilus grandis*), Sacramento sucker (*Catostomus occidentalis*), California roach (*Lavinia symmetricus*), three spine stickleback (*Gasterosteus aculeatus*), and sculpin (*Cottus* spp.), as well as introduced species such as the mosquitofish (*Gambusia affinis*).

Seasonal Drainage

Vegetation

Seasonal drainage habitat is scattered throughout the BSA and includes both natural and constructed features that carry water on an ephemeral or seasonal basis. Seasonal drainages help to reduce flooding by conveying stormwater during and after storm events. Most natural seasonal drainages in the BSA ultimately drain to Suisun Bay via either Cordelia Slough or Peytonia Slough. Constructed seasonal drainages include features that were artificially constructed in uplands to convey stormwater runoff and do not replace natural features. Both concrete lined and earthen bottom ditches are located alongside roadways, railroads, and agricultural fields throughout the BSA.

Wildlife in Seasonal Drainage Habitat

Wildlife found in seasonal wetlands includes the same bird and amphibian species detailed in the ***Wildlife in Perennial Wetlands*** discussion above. However, the native western pond turtle may also be present in some seasonal drainages when water is present.

ENVIRONMENTAL CONSEQUENCES

The Build Alternative is the only action alternative moving forward for the proposed project. Other alternatives were considered but eliminated as none were deemed viable because of physical constraints and feasibility, or because they did not meet the project's purpose and need. See **Section 1.4.3, Alternatives Considered but Eliminated from Further Discussion**.

Build Alternative

Direct Impacts

The Build Alternative effects to the aquatic and wetland habitat, within the BSA are shown in **Table 2.3-3**, which includes isolated calculations for the West and East Segments. Although the impact area is relatively small, the permanent loss of aquatic habitat could affect existing functions and values along both channels if such values were not replaced. Direct permanent impacts on wetlands would occur because of road widening. Construction of the Build Alternative would involve substantial grading and earth moving activities, stockpiling of soils, and the loading, unloading, and transport of excavated and fill material. Temporary impacts on aquatic habitat may occur from grading or access activities and from dewatering as part of placement of coffer dams in the creeks. This work would be temporary in nature and fill would be removed within one season and pre-construction conditions restored. Aquatic habitat is expected to re-establish rapidly after these activities. Permanent impacts would include direct placement of fill within wetlands and loss of wetland vegetation due to shading effects. Impacts to wetlands and other habitat types are shown in **Appendix H**.

Aquatic and wetland communities are natural communities of special concern that perform many important environmental functions, including recycling nutrients, purifying water, attenuating floods, recharging ground water, and providing habitats for flora, fauna, and aquatic species. Detailed descriptions of this habitat and mapping are included in greater detail within the NES (Caltrans, 2014k).

Indirect Impacts

Rainfall could carry loose soils into adjacent waterways, resulting in increased sedimentation and adverse effects to water quality. Concentrated flow due to grading in some areas will increase the potential for erosion and for increased sediment transport into the adjacent areas. Construction equipment debris and fuel could also further degrade the quality of storm water runoff if fueling activity and maintenance products are not handled properly. This contamination could impact nearby waterways, including the jurisdictional water features within the BSA. Temporary measures and Best Management Practice (BMPs) that will control pollutant discharges during construction activities are described in **Section 2.2.2, Water Quality and Storm Water Runoff**. Indirect impacts on wetlands also include shading effects from the new wider bridges at Ulatis Creek and Horse Creek within the East Segment. The resulting impact on vegetation growth is expected to be permanent.

The Build Alternative would add over 1 acre of new impervious area, through road and structure widening and modifications to the existing roadway and ramps. Additional impervious area prevents runoff from naturally dispersing and infiltrating into the ground, resulting in increased concentrated flow. The additional flow has the potential to transport an increased amount of sediment and pollutants to waterways and water resources, and create increased erosion resulting from changes to waterway hydrographs (flow versus time) pre- and post-construction. This phenomenon is termed hydromodification.

Project-specific, permanent effects on aquatic and wetland habitat would be substantial if not mitigated. Coordination with USACE regarding these effects is discussed above in *Affected Environment*.

West Segment – Fundable First Phase

Construction of the West Segment of the Build Alternative would result in approximately 0.01 acre of permanent impacts to wetland habitat and 0.32 acre of temporary impacts to aquatic habitat within the BSA. The indirect effects of the Build Alternative associated with water quality and the natural functions of the wetlands and waters within the BSA, as described above, apply to the West Segment.

Permitting

A Section 404 permit is necessary when a project will result in fill to waters under USACE jurisdiction. A preliminary jurisdictional delineation of these resources will be completed and submitted to USACE for verification. The Build Alternative would result in permanent and temporary effects to wetland and water features within the Caltrans right-of-way. A Section 404 permit would be required for the Build Alternative.

A Section 401 Water Quality Certification is necessary when a project requires a Section 404 permit from the USACE, and under other special circumstances. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required.

A Section 1602 Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The East Segment would result in work within the channel of Ulatis Creek and Horse Creek. Therefore, a Section 1602 permit would be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative.

Executive Order 11988 directs all federal agencies to avoid the long- and short-term adverse impacts associated with the modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative and to restore and preserve the natural and beneficial values served by floodplains. The project would not result in the substantial or adverse modification of any floodplain. Similarly, the project does not directly or indirectly support further development within a floodplain.

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to I-80 corridor within the BSA. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of jurisdictional waters as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USACE, RWQCB, and CDFW requirements regarding protected Waters of the U.S., should those features be identified within areas that would be directly or indirectly affected. The potential presence of jurisdictional waters in areas outside of the BSA would be determined under separate environmental review.

Least Environmentally Damaging Practicable Alternative

A detailed discussion of the considerations made in the determination of the LEDPA is included in this section under *Only Practicable Finding*. The Build Alternative encompasses the best possible design, based on predicted 2040 traffic conditions and physical features of the area. The Build Alternative is the LEDPA, and includes measures to reduce harm to wetlands, as described below under *Only Practicable Finding*.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Construction activities and operation of the roadway improvements would be regulated under the applicable Caltrans' National Pollutant Discharge Elimination System (NPDES) permit and Storm Water Management Plan (SWMP), which regulate storm water discharge from activities on roadways. The potential for adverse effects to water quality will be avoided by implementing the temporary and permanent BMPs outlined in the Storm Water Pollution Prevention Plan (SWPPP). Caltrans erosion control BMPs will be used to minimize any wind or water-related erosion. The project would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff. See **Section 2.2.1, Hydrology and Floodplain**, and **Section 2.2.2, Water Quality and Storm Water Runoff (Measures HYDR-1 and WQ-1)** for a more detailed analysis of the avoidance measures that would be implemented to protect water quality. These avoidance measures would also protect the natural functions of the affected wetlands and waters and any associated habitat. Additionally, avoidance measures would also avoid or minimize impacts to riparian woodlands within the BSA (**Measure BIO-1**) and Caltrans standard BMPs will be incorporated into the project to protect water quality during construction (**Measure BIO-2**). Implementation of these measures (**Measures HYDR-1, WQ-1, BIO-1, and BIO-2**) would provide the avoidance and minimization measures required to minimize the indirect impacts to wetlands and other water features located within the BSA.

Mitigation Measure BIO-C: Compensatory Mitigation for Aquatic and Wetland Restoration. Compensation for permanent impacts on up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite. These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acres of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.

Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement. Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite. These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.

Mitigation Measures BIO-C and BIO-D, in combination with the avoidance and minimization measures listed above (**Measures HYDR-1, WQ-1, BIO-1, and BIO-2**), would reduce effects to wetlands and waters of the U.S. to a negligible level, and may be used to satisfy the conditions of multiple agencies and jurisdictions. With the implementation of

these avoidance, minimization, and mitigation measures, the project would not have a substantial effect on riparian woodland or aquatic habitat because no net loss of habitat would occur and other project effects would be relatively small and of a temporary nature.

ONLY PRACTICABLE FINDING

Executive Order for the Protection of Wetlands (EO 11990) regulates the activities of federal agencies with regard to wetlands. This executive order states that a federal agency, such as the Federal Highway Administration (FHWA) and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

Within the existing project corridor, no other build alternatives were deemed viable because of the physical constraints and developed land uses surrounding the roadways. Other alternatives were considered but eliminated as none were deemed viable because of the physical constraints and feasibility, or because they did not meet the project's identified purpose and need (see **Section 1.4.5, Alternatives Considered but Eliminated from Further Discussion**). As such, there are no alternatives that would avoid impacting wetland resources.

With implementation of the Build Alternative there would be permanent and temporary effects to wetland and water features within the Caltrans right-of-way. However, the appropriate permitting would be obtained and adhered to. A Section 404 permit would be implemented for the Build Alternative. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative. Therefore, a Section 1602 Lake or Streambed Alteration Agreement with CDFW is not necessary for the West Segment.

In addition to the adherence of the permitting requirements stated above, Mitigation **Measures HYDR-1 and WQ-1, BIO-1, BIO-2, BIO-C, and BIO-D** would also ensure that the least possible impact would occur to jurisdictional wetlands and other waters upon project implementation. Based on the above considerations, it is determined that there is no practicable alternative to the proposed construction in wetlands and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use.

2.3.3 PLANT SPECIES

REGULATORY SETTING

The U.S. Fish and Wildlife Service (USFWS) and CDFW have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a

general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see **Section 2.3.5, Threatened and Endangered Species** in this document for detailed information about these species.

This section of the document discusses all the other special-status plant species, including CDFW species of special concern, USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at Fish and Game Code, Section 1900-1913, and the California Environmental Quality Act, CA Public Resources Code, Sections 2100-21177.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014k).

The identification of special-status plant species with potential to occur in the region was based on a search of the USFWS Species List Database and the CNPS Inventory of Rare and Endangered Plants for the following 7.5-minute quadrangles: Cordelia, Fairfield South, Fairfield North, Elmira and Allendale, California. The California Natural Diversity Database (CNDDB) was queried for all occurrence records within 10 miles of the BSA. As previously discussed, botanical surveys conducted between 2011 and 2013 to locate, map, and record any special-status plant populations within the BSA. Repeat surveys were conducted throughout the growing season in order to capture the blooming and/or fruiting periods of all target special-status plant species.

The database searches and initial habitat mapping identified 66 special-status plant species that could potentially occur within the BSA [see Appendix D of the NES (Caltrans2014k)]. Only one special-status plant was identified during the protocol-level surveys, Ferris' goldfields (*Lasthenia ferrisiae*), which is listed as a California Rare Plant. This species was

found in a newly re-constructed I-80 on-ramp within the West Segment. The area appeared to have recently undergone construction activities (i.e., the area had been hydroseeded and straw wattles were present at the time of the survey).

Ferris' goldfields is an annual herb in the sunflower family that blooms from February through May. It occurs in central and northern California in alkaline, clayey vernal pools, and clay-based alkaline sinks at elevations of 66 to 2297 feet. Ferris' goldfields is known to be tolerant of soil disturbance and intolerant of competition with non-natives. Construction activities in the area where this plant was found likely temporarily improved habitat quality for this species by reducing competition with non-native grasses and by providing supplemental irrigation. The combination of soil disturbance and irrigation likely stimulated the germination of dormant seeds. However, this population of Ferris' goldfields within the BSA will likely not persist over time, as non-native species become increasingly dominant and the area no longer receives supplemental watering.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Project activities, such as grading, structure and infrastructure placement, and equipment staging, could directly affect individual Ferris' goldfields. Individual plants and populations may be lost as a result of mechanical or physical removal of vegetation in the BSA, and damage to plants may occur as a result of crushing by equipment; trampling; and compaction of soil, which could result in damage to plant roots. These activities could result in death, altered growth, or reduced seed set through physically breaking, crushing, wilting, or uprooting plants. However, due to the proximity of the population to development and the resulting altered hydrology, this population is unlikely to persist, even in the absence of additional construction disturbance. This species was not observed during a reconnaissance site visit on May 9, 2014. Further, this species is widely distributed across California (including Solano County). Thus, project activities would potentially affect only a very small proportion of the regional populations of this species, and possibly would not affect this species at all. Therefore, this project would not result in substantial adverse effects on Ferris' goldfields.

West Segment –Fundable First Phase

Adverse effects to Ferris' goldfields described above for the Build Alternative are applicable to the West Segment. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the plant species. Project activities within the West Segment would potentially affect only a very small proportion of the regional populations of this species, and possibly would not affect this species at all. Therefore, the construction of the West Segment would not result in substantial adverse effects on Ferris' goldfields..

No-Build Alternative

The No-Build Alternative would make no physical or operational improvements to the northbound I-80 corridor, within the project limits. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of special-status plant species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected plant species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of special-status plant species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Project activities are not expected to have a substantial adverse effect on Ferris' goldfields populations or their habitats, thus no avoidance measures or compensatory mitigation is warranted for this species.

2.3.4 ANIMAL SPECIES

REGULATORY SETTING

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in **Section 2.3.5, Threatened and Endangered Species**. All other special-status animal species are discussed here, including CDFW fully protected species and species of special concern, and USFWS or NOAA Fisheries Service candidate species.

Federal laws and regulations pertaining to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations pertaining to wildlife include the following:

- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Section 4150 and 4152 of the California Fish and Game Code

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014k).

The identification of special-status animal species with potential to occur in the region was based on a search of the USFWS Species List Database, the CNDDDB for the five USGS quadrangles surrounding the BSA, reports previously prepared for the project, other relevant information from the CDFW, technical publications, field reconnaissance surveys, and habitat assessments completed for the project. The results of these efforts are further discussed under the appropriate topics within this section, and are documented in the NES.

A literature and database search, and the biologist's familiarity with the region, identified 55 wildlife species that could potentially occur within the BSA. **Appendix I** lists each of these species and describes whether or not the species could occur in the BSA. A wildlife habitat assessment was conducted within the BSA in 2011, 2012, and 2013 and 37 of these species were dropped from consideration based on a lack of suitable habitat, or because the BSA is outside the known range of the species. Those species dropped from consideration are not discussed further. The following five species that have the potential to occur within the BSA are federally and/or state threatened species and are described in **Section 2.3.5,**

Threatened and Endangered Species:

- Valley elderberry longhorn beetle
- Central Valley steelhead
- Central California Coast steelhead
- California red-legged frog
- Swainson's hawk

The short-eared owl (*Asio flammeus*) is only a California species of special concern when nesting, and it is not expected to breed in the BSA or be adversely affected by project activities. Thus, it is not discussed further. The remaining 12 special-status species are discussed below.

Central Valley Fall-Run Chinook Salmon

The Central Valley fall-run Chinook salmon (*Oncorhynchus tshawytscha*) is an anadromous California species of special concern that represents a population of Chinook salmon that migrate from the ocean to spawning streams in late fall and begin spawning in beds of coarse river gravels between October and December. Chinook salmon spawn and rear in the mainstem Sacramento River and suitable perennial tributaries. The species has been documented within several drainages that run through the BSA. More recently, Chinook salmon have been observed in the project region in:

- Green Valley Creek upstream to the base of Green Valley Falls
- Suisun Valley Creek upstream to the Napa/Solano County line
- LedgeWood Creek upstream of I-80
- Laurel Creek from upstream to Travis Boulevard
- Immediately north of I-80
- Ulatis Creek at Nut Tree Road

American Badger

The American badger (*Taxidea taxus*), a California species of special concern, is a highly specialized fossorial (adapted for burrowing or digging) mammal that occurs in a range of habitats, such as annual grasslands, oak woodland savannas, and semi-arid shrub/scrubland, that contain friable soils and relatively open ground. Badgers are primarily nocturnal, though they are often active during the day. They dig burrows both in pursuit of prey (e.g., gophers, kangaroo rats, and chipmunks) and to create dens for cover and raising of young. Badgers breed during late summer, and females give birth to a litter of young the following spring. Solitary animals, the home range of individuals varies by sex, season, and resource availability.

Suitable habitat is present in the BSA and surrounding vicinity, as evidenced by the observation of a roadkill individual within the BSA during surveys of the site. Because badgers are territorial and solitary, and have large home ranges, badgers are expected to occur in the BSA only in very low numbers. They are most likely to occur in the central portion of the BSA where large expanses of grassland occur adjacent to the I-80 corridor.

Western Pond Turtle

The western pond turtle, (*Actinemys marmorata*) is a California species of special concern. Western pond turtles can be found in intermittent and perennial slow-moving waters, including stock ponds, streams, rivers, marshes, and lakes. Pond turtles require areas with ample basking sites and underwater refugia, and eggs are laid in grasslands or other open uplands. Nesting sites seem to require open habitat with full sun exposure and are typically located along stream or pond margins, but if no suitable habitat is available adults may travel overland up to 0.25 mile or more from water to nest. The nesting season typically occurs from April through July with the peak occurring in late May to early July. Suitable habitat is present in the BSA and the species was observed during surveys of the site. Although no focused surveys were performed for this species, individuals were observed in Laguna Creek within the BSA during field surveys. In addition, the CNDDDB includes a record of this species in a channel near the outlet of Lagoon Valley Reservoir approximately 0.2 mile east of the BSA. All the perennial drainages and wetlands within the BSA provide suitable aquatic

foraging and dispersal habitat for the pond turtle year round, while the seasonal drainages and wetlands provide suitable foraging and dispersal habitat when water is present. Further, uplands adjacent to wetlands and drainages within the BSA provide potential nesting habitat for the species.

Bat Species

Three state special-status bat species have potential to occur within the BSA based on range, habitat, and recorded occurrences in the region:

- Pallid bat (*Antrozous pallidus*), a California species of special concern
- Townsend's big-eared bat (*Corynorhinus townsendii*), a California species of special concern
- Western red bat (*Lasiurus blossevillii*), a California species of special concern.

Pallid bats are most commonly found in oak savannah and in open dry habitats with rocky areas, trees, buildings, or bridges for roosting. Coastal colonies commonly roost in deep crevices in rocky outcroppings, in buildings, under bridges, and in the crevices, hollows, and exfoliating bark of trees. Colonies can range from a few individuals to over a hundred, and usually this species occurs in groups larger than 20 individuals. Males and females typically occupy the same late-fall and winter roosts found in canyon bottoms and riparian areas. After mating with males during the late-fall and winter season, females leave to form a separate maternity colony, often on ridge tops or other warmer situations. Pups are typically born from late April to July, and weaning occurs in August, although dates vary across latitudes and between years. Although crevices are important for day roosts, night roosts often include open buildings, porches, garages, highway bridges, and mines. Pallid bats may travel up to several miles for water or foraging sites if roosting sites are limited. They may also occur in open coniferous forests. Pallid bat roosts are very susceptible to human disturbance. Eight bridges/culvert crossings within the BSA provide suitable roosting habitat. Although no pallid bats were detected during focused surveys of these structures, the surveys were conducted outside the maternity season.

The Townsend's big-eared bat is a colonial species, and females aggregate in the spring at maternity colonies to begin their breeding season, which may extend through the end of August. Females give birth to one young, and females and young show a high fidelity to both their group and their specific roost site. Although the Townsend's big-eared bat is usually a cave dwelling species, many colonies are found in anthropogenic structures, such as the attics of buildings or old abandoned mines. Known roost sites in California include limestone caves, lava tubes, mine tunnels, buildings, and other structures. This species also roosts in deep crevices of redwood trees. Radio tracking studies suggest that movement from a colonial roost during the maternity season is confined to the area within 9 miles of the roost. This species is easily disturbed while roosting in buildings, and females are known to abandon their young when disturbed. Suitable roosting habitat is not present in the BSA; however, the species may forage over the BSA and was detected during focused bat surveys of the area.

The western red bat does not breed in the project area but roosts in the foliage of trees in Solano County during winter or migration. Western red bats are strongly associated with intact cottonwood/sycamore valley riparian habitats in low elevations and the loss of such habitat throughout its range threatens the persistence of the species. Both day and night roosts are usually located in the foliage of trees; red bats in the Central Valley show a preference for large trees and extensive, intact riparian habitat. Day roosts are often located along the edges of riparian areas, near streams, grasslands, and even urban areas. During the breeding season, red bats establish individual tree roosts and occasionally small maternity colonies in riparian habitats, in locations usually hidden from every direction except below. Little is known about the habitat use of western red bats during the nonbreeding season. The red bat uses echolocation to capture insects in mid-flight and require habitat mosaics or edges that provide close access to foraging sites as well as cover for roosting. This species was detected at three locations within the BSA.

Focused surveys within the BSA identified six bridges/culvert crossings (including sites in both the East and West Segments) that provide suitable night roosting habitat for bats, and two bridges (both in the East Segment) that provide potential day roosts (see **Table 2.3-5**).

No pallid bats were detected during these surveys, suggesting that the species does not regularly use the BSA. However, the surveys were conducted between 31 August and 1 October, which is outside the pallid bat maternity season. As pallid bats can occupy different roost sites during the maternity season than during the fall, it is possible that pallid bats could day and/or night roost in several bridges/crossings identified in **Table 2.3-5**. Although suitable roosting habitat for the Townsend's big-eared bat is not present in the BSA due to the lack of caves, mines, or abandoned buildings, suitable foraging habitat is present and the species was detected foraging in the BSA during focused bat surveys. Western red bats were detected in the BSA during the focused bat surveys in low numbers, and may roost in foliage in trees, particularly those within the riparian habitat throughout the BSA.

Specifically, in the West Segment, focused surveys for bats and bat roosting habitat within the BSA identified four bridges/culvert crossings that provide suitable night roosting habitat for bats, including the pallid bat. However, no potential day roosting habitat for bats was identified within the West Segment (see **Table 2.3-5**). Although suitable roosting habitat for the Townsend's big-eared bat is not present within the West Segment, suitable foraging habitat is present. Western red bats occur in the West Segment, in low numbers as migrants and winter residents and may roost in foliage in trees, particularly those within riparian habitat.

Table 2.3-5 Bridge/Crossing Structures within the BSA that Provide Bat Roosting Habitat

Bridge/Crossing	Segment	Day Roosting Habitat Present?	Night Roosting Habitat Present?	Bats Detected
Green Valley Creek Bridge	West	No	Yes	Yuma myotis California myotis
Dan Wilson Creek Bridge	West	No	Yes	Yuma myotis California myotis
Suisun Creek Bridge	West	No	Yes	Yuma myotis California myotis Western red bat
Ledgewood Creek Bridge	West	No	Yes	None
Soda Springs Culvert	East	Yes	Yes	Yuma myotis California myotis Western red bat Townsend's big-eared bat
Laurel Creek Culvert	East	No	Yes	Yuma myotis California myotis Western red bat Townsend's big-eared bat
Laguna Creek Bridge	East	Yes	Yes	Yuma myotis
Alamo Creek Bridge	East	No	Yes	Yuma myotis California myotis

Source: Caltrans 2014k

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a California species of special concern. This species favors flat, open grassland or gentle slopes and sparse shrubland ecosystems for breeding, though they will also readily colonize agricultural fields and other developed areas. Mammal burrows, or other structures that mimic burrows, provide secure nesting locations and nonbreeding refuges and are a fundamental ecological requirement of burrowing owls. In California, owls are most often found in close association with California ground squirrel burrows. Ideal habitat for burrowing owls is comprised of annual and perennial grasslands with low vegetation height, sparse or nonexistent tree or shrub cover, and an abundance of mammal burrows. The nesting season as recognized by the CDFW (1995) runs from February 1 through August 31. After nesting is completed, adult owls may remain in their

nesting burrows or in nearby burrows, or may migrate; young birds disperse across the landscape.

No burrowing owls, or secondary evidence of owl presence, were observed within the BSA during reconnaissance surveys, although the biologists did not conduct focused surveys for this species. However, burrowing owl habitat is present within the BSA, and five occurrences of the species have been recorded in the project vicinity; the nearest known extant population located approximately 1.2 miles to the east. Suitable habitat (i.e., ground squirrels and other small mammal burrows) was observed in the grasslands and ruderal areas in the BSA. Burrowing owls may nest and/or forage within these areas.

Migratory Birds

The Migratory Bird Treaty Act (MBTA) (16 USC 703) protects migratory birds, their occupied nests, and their eggs. Removal or disturbance of active nests would be in violation of these regulations. All native birds in the project area are protected under the MBTA and California Fish and Game Code. In addition to common bird species, several special-status bird species have at least some potential to nest or forage within the BSA, including:

- Swainson's hawk (*Buteo swainsoni*), State threatened species
- Northern harrier (*Circus cyaneus*), California species of special concern
- Grasshopper sparrow (*Ammodramus savannarum*), California species of special concern.
- Tri-colored blackbird (*Agelaius tricolor*), California species of special concern at its nesting colonies.
- Loggerhead shrike (*Lanius ludovicianus*), California species of special concern when nesting.
- White-tailed kite (*Elanus leucurus*), State fully protected species.

The Swainson's hawk is discussed in **Section 2.3.5, Threatened and Endangered Species**. The northern harrier nests in marshes and moist fields, and forages over open areas. Grasslands and agricultural fields in and adjacent to the BSA provide suitable nesting and foraging habitat. Northern harriers have been observed in the vicinity of the BSA although none were observed within the BSA during surveys conducted by the biologists. The grasslands and marsh habitat within the BSA provide suitable foraging habitat for this species; however, harriers typically nest and forage in the interiors of large expanses of open habitat, not very close to high volume roadways. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

Tri-colored blackbird nesting colonies are usually located near fresh water in dense emergent vegetation. The species is highly colonial when nesting, forming dense breeding colonies that, in some areas, may consist of up to tens of thousands of pairs. Suitable nesting and

foraging habitat is present in the BSA. Potential foraging habitat (e.g., perennial marsh, seasonal marsh, and grasslands) for the tricolored blackbird is present within and immediately adjacent to the BSA. However, the tricolored blackbird has not been recorded breeding in the BSA, the nearest record of its occurrence is located approximately 11 miles to the east near Jepson Prairie Preserve, and the species is not expected to breed within the BSA due to the high levels of disturbance associated with the freeway. Thus, although individuals may occasionally forage in the BSA, they are not expected to nest there.

The grasshopper sparrow breeds in open, short grasslands with scattered clumps of shrubby vegetation, constructing domed ground nests with grasses in patches of dense vegetation. They nest and forage in extensive open grasslands, meadows, fallow fields, and pastures. Grasslands within the BSA provide suitable nesting and foraging habitat for the grasshopper sparrow. Although some grasslands within the BSA represent potentially suitable breeding and foraging habitat for the grasshopper sparrow, much of the grassland habitat occurs as small, isolated patches that are unlikely to be occupied by this species, which prefers large, unfragmented areas of grassland. Further, this species is not expected to nest close to I-80, both due to the disturbance and noise associated with the highway and because this species typically nests in the interiors of large grassland areas, rather than at the edges formed by the highway. The species has been observed in the vicinity of the BSA, although none were observed within the BSA during surveys conducted by the biologists.

The loggerhead shrike can be found in grasslands, scrub habitats, riparian areas, other open woodlands, ruderal habitats, and developed areas including golf courses and agricultural fields. Ideal breeding habitat for loggerhead shrikes is open, with short grassy vegetation punctuated by many perches, shrubs, or trees for nesting, and sharp branches or barbed wire fences for impaling prey. They nest in tall shrubs and dense trees and forage in grasslands, marshes, and ruderal habitats. The breeding season may begin as early as late February and lasts through July. Suitable breeding and foraging habitat is present in the BSA and the species was observed during surveys of the BSA. However, because of the BSA's proximity to I-80, particularly given that high quality nesting and foraging habitat (e.g., open agricultural fields and pastures) more removed from the high levels of disturbance caused by the I-80 are abundant in the project region, the number of pairs of loggerhead shrikes that may nest in the BSA is expected to be very low.

The white-tailed kite (*Elanus leucurus*), a State fully protected species, is a year-round resident in the project vicinity, establishing breeding territories in grasslands, agricultural fields, cismontane woodlands, and other open habitats that encompass open areas with healthy prey populations, and snags, shrubs, trees, or other nesting substrates. The presence of white-tailed kites is closely tied to the presence of prey species, particularly voles. The presence of prey may be the most important factor in determining habitat quality for white-tailed kites. This species nests in tall shrubs and trees and forages in grasslands, marshes, and ruderal habitats. Suitable nesting and foraging habitat is present and the species was observed during surveys of the BSA. However, because of the BSA's proximity to high levels of disturbance caused by I-80, and the abundance of high quality nesting and foraging habitat

(e.g., open agricultural fields and pastures) more removed from freeway corridor, the number of pairs of white-tailed kites that may nest in the BSA is expected to be very low.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Central Valley Fall-Run Chinook Salmon

The project would result in the permanent loss of 0.03 acre of perennial drainage due to placement of new piers at the Ulatis and Horse Creek bridge crossings and increased shading of aquatic habitat due to the new wider bridges. The project would also result in the temporary disturbance of 0.37 acre of perennial drainage due to temporary dewatering for construction (if required) and construction access at the Ulatis and Horse Creek bridge sites. The majority of reaches with the most suitable gradient for salmonid habitat in Upper Ulatis Creek, including the reach within the BSA, are located in a region that exceeds the temperature threshold for salmonids (i.e., too hot to provide suitable rearing habitat in summer). In addition, two potential fish passage barriers (i.e., water control structures that create 6-foot vertical drops in the concrete-lined portions of the flood control channel) have been identified in Ulatis Creek downstream of the BSA, reducing the potential for salmonids to reach the project area. Similarly, Horse Creek within the BSA appears to go dry often during the summer months and is unlikely to support salmonid rearing habitat in the summer. Because of the low quality of salmonid habitat within the reaches of Ulatis Creek and Horse Creek within the BSA, Chinook salmon are not expected to be present in any numbers.

Salmonids may experience reduced foraging success due to project-related turbidity downstream. Although the project proposes modification of the bridges at Ulatis and Horse Creeks to facilitate widening of the freeway, the modifications would not result in the addition of new barriers or exacerbation of any existing impediments to salmonid movement.

American Badger

Implementation of the Build Alternative would not result in the loss of a substantial amount of habitat for the American badger; only 2.67 acres of non-native annual grassland would be permanently impacted. Grasslands are abundant in the project region, and the loss of 2.67 acres would not result in a substantial decrease in the amount of this habitat type available regionally to the species. Further, the project would not impede movement of badgers through the area or substantially increase the risk of road mortality. However, badgers may occur in the BSA in low numbers and may be directly impacted by project activities through injury and mortality. If badgers have to be evicted from their dens, there is some potential that they may be exposed to greater predation risk or greater road mortality while they are seeking out new denning sites, especially if suitable habitat in adjacent areas is already occupied by badgers. However, the number of badgers within the BSA is expected to be extremely low.

Western Pond Turtle

Implementation of the Build Alternative might result in the injury or mortality of small numbers of turtles as a result of individual turtles or their eggs being crushed by personnel or equipment or as a result of desiccation or burying during project work near perennial drainages and wetlands within the BSA. The Build Alternative would result in the permanent loss of 0.17 acre of aquatic/wetland habitat due to the placement of piers at the Ulatis and Horse Creek bridge sites, and the fill of wetlands due to the widening of the freeway in the East Segment. Due to the regional abundance of similar aquatic/wetland habitats in the project vicinity, the loss of 0.17 acres of aquatic habitat is not expected to result in a substantial adverse effect on the western pond turtle.

Bat Species

The Build Alternative may result in a temporary impact on foraging pallid bats, western red bats, and Townsend's big-eared bats through the alteration of foraging patterns (e.g., avoidance of work sites because of increased noise and activity levels during project construction). However, due to the abundance of suitable foraging habitat in the project vicinity and the mobility of these bats, as well as the relatively low proportion of potential foraging habitat that would be disturbed as a result of the project, impacts to these three bat species would not be substantial.

Pallid Bat

Implementation of the Build Alternative would not result in the modification of any structures identified as providing suitable day and/or night roosting habitat for bats. Thus, the project is not expected to result in the permanent loss of roosting habitat or the pallid bat. However, project disturbance associated with construction activities near bridges that provide suitable pallid bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) could result in bats flushing from their roost under a bridge during the day. These bats could potentially suffer increased predation rates, and construction during the maternity season (April 1 to July 31) could result in abandonment of young by their mothers, resulting in mortality of the young.

Western red bat

Construction of the Build Alternative could result in the loss of roosting sites for western red bats due to tree removal. Further, if trees that contain individual western red bats are removed, modified, or exposed to increased disturbance, individual bats could be subjected to physiological stress as a result of being disturbed during torpor, or subjected to increased predation due to exposure during daylight hours. However, red bats are likely to flush from trees when approached by heavy equipment, before trees themselves are impacted, so that injury or mortality is unlikely. Further, western red bats are not colonial. Thus, the permanent loss of a roost site (e.g., tree) would not result in a substantial impact on local or regional populations as only individuals, not entire colonies, would be affected. Further,

suitable roost sites for this species are sufficiently abundant and widespread that the loss of small numbers of trees from the project would not substantially reduce roost site availability, either locally or regionally.

Townsend's big-eared bat

Townsend's big-eared bats are not expected to roost in the BSA. Thus, the project would not adversely affect roosting habitat for this species.

Burrowing Owl

The Build Alternative is not expected to result in impacts on high-quality burrowing owl breeding habitat due to the proximity to I-80 and the lack of evidence of owl use in the project limits. However, the project would result in impacts on low-quality nesting, foraging, and/or roosting habitat for burrowing owls. Approximately 2.67 acres of nonnative annual grassland and 4.80 acres of ruderal habitat would be permanently lost as a result of roadway improvements. In addition, 11.28 acres of non-native annual and 9.98 acres of ruderal habitats would be temporarily disturbed as a result of project staging and temporary construction access. However, such areas will be restored to pre-construction conditions following project completion. In the unlikely event that owls are found to be nesting within the BSA, construction related disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment.

Migratory Birds

Although project activities would occur along the margins of suitable habitat for the Swainson's hawk, northern harrier, grasshopper sparrow, tri-colored blackbird, loggerhead shrike, and white-tailed kite, the potential for such activities to disturb a nest to the point of abandonment would be very low because none of these species are expected to nest near the high volume roadway where project activities would be concentrated. Further, although vegetation removal for the Build Alternative could reduce nesting habitat for a number of bird species protected under the Migratory Bird Species Act, disturbance of foraging habitat would unlikely have a substantial effect on local and regional populations of these species because of the low number of breeding birds relative to the extent of suitable foraging habitat and abundance of prey. Therefore, the project is not expected to substantially reduce these species' populations or nesting habitats and any project impacts would be minimal.

West Segment – Fundable First Phase

Adverse effects to animal species described above for the Build Alternative are applicable to West and East Segments. The effects summarized in the above discussion provide specific sensitive habitat locations for each animal species. As previously discussed, the distribution of suitable habitat types within the BSA varies depending on the characteristics and needs of the animal species. The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and

gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Certain impacts are more prevalent in the East Segment of the Build Alternative because of the more expansive work proposed as part of the freeway widening, specifically the structural improvements proposed at Ulatis Creek and Horse Creek. The construction activities needed for the conversion of the HOV lanes to express lanes within the West Segment is substantially less intensive. As such, the West Segment of the Build Alternative is expected to have lower direct and indirect effects to animal species when compare to the East Segment (see **Table 2.3-2**).

The Build Alternative would have no impact on stream crossings within the West Segment; no adverse effects to Chinook salmon are anticipated. Within the West Segment, only 0.07 acre of non-native annual grassland would be permanently impacted. Thus, construction of the West Segment would not have a substantial adverse effect on the American Badger habitat. Construction of the West Segment would not require work near any structures identified as providing suitable day roosting habitat for bats (i.e., Laguna Creek Bridge and Soda Springs Culvert). Construction of the West Segment would therefore not have the potential for day roost disturbance.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lane in the northbound direction would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to biological resources. Implementation of the currently planned and funded projects outside the BSA but within the project region would be subject to the same potential presence of special-status animal species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected animal species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of special-status animal species in areas outside of the BSA would be determined under separate environmental review.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Central Valley Fall-Run Chinook Salmon

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures HYDR-1 and WQ-2** and **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures** below), for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that

could be present in these aquatic habitats. Additionally **Measure BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid take, disturbances or injury of the Chinook salmon, habitat protection, and biological monitoring.

American Badger

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** below would reduce the potential for adverse effects to the American badger during project construction. These measures include pre-construction surveys (**Measure BIO-9**) and development of appropriate measures, in consultation with the CDFW, if an active den is found (**Measure BIO-10** and **BIO-11**).

Western Pond Turtle

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures** below would reduce the potential for adverse effects to the western pond turtle during project construction. These measures include water quality protection during construction (**Measure BIO-2**), pre-construction surveys (**Measure BIO-12**), required buffer zones if a nest is detected (**Measure BIO-13**), and daily surveys during construction when warranted (**Measure BIO-14**).

Bat Species

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to roosting bats during project construction. These measures include work restrictions and buffer zones for day roosting habitat (**Measure BIO-15**), bat eviction procedures and timelines (**Measure BIO-16**), and biologist assessments (**Measure BIO-17**).

Burrowing Owl

Mitigation Measure BIO-E: Compensatory Mitigation for the Burrowing Owl.

Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for effects to burrowing owls during project construction. These measures include preconstruction surveys (**Measure BIO-18**), biologist consultations and recommendations (**Measure BIO-19**), and coordination with regulatory agencies for any owl evictions (**Measure BIO-20**).

Implementation of the avoidance and minimization measures and mitigation measure listed above would ensure that active burrowing owl nests are not disturbed, that individuals are safely relocated before their burrows are impacted, and that permanent loss of occupied burrowing owl breeding habitat is adequately compensated.

Migratory Birds

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to migratory bird species. These measures include a work window for vegetation removal and preconstruction surveys (**Measure BIO-21**), deterrence of nesting birds and nest-start removal (**Measure BIO-22**), and non-disturbance buffers for nesting birds (**Measure Bio-23**).

West Segment – Fundable First Phase

No avoidance, minimization, or mitigation measures specific to the West Segment would be required beyond the ones described above under the Build Alternative. The West Segment portion of the Build Alternative, from west of Red Top Road to Air Base Parkway, would convert approximately eight miles of existing HOV lanes into express lanes. Work would comprise mostly of foundation installation for poles and gantries where new signs would be installed and foundation pad and trenching for electrical conduits. Certain impacts are more prevalent in the East Segment of the Build Alternative because of the more expansive work proposed as part of the freeway widening, specifically the structural improvements proposed at Ulatis Creek and Horse Creek. The construction activities needed for the conversion of the HOV lanes to express lanes within the West Segment is substantially less intensive. As such, the West Segment of the Build Alternative is expected to have lower direct and indirect effects to animal species when compare to the East Segment (see **Table 2.3-2**). Where applicable, the avoidance and minimization measures specify the locations in which the measures should be applied (i.e., measures that dictate restrictions on work within Ulatis Creek are thereby only applicable to East Segment of the project).

2.3.5 THREATENED AND ENDANGERED SPECIES

This section addresses species listed or eligible for listing as threatened or endangered. The USFWS list of federally listed species with the potential to occur within the BSA is provided in **Appendix H**.

REGULATORY SETTING

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act (FESA): 16 United States Code (USC) Section 1531, et seq. See also 50 Code of Federal Regulations (CFR) Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the Federal Highway

Administration (FHWA), are required to consult with the USFWS and the NOAA Fisheries Service to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a No Effect finding. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFW is the agency responsible for implementing CESA. Section 2081 of the Fish and Game Code prohibits “take” of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as “hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill.” CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by the CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of the FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

AFFECTED ENVIRONMENT

Valley elderberry longhorn beetle

The valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is a Federally threatened species. The beetle’s habitat consists primarily of riparian forests whose dominant plant species include cottonwood, sycamore, valley oak, and willow, with an understory of elderberry shrubs. Blue elderberry shrubs in the Central Valley with basal stem diameters larger than 1 inch are considered by the USFWS as potential valley elderberry longhorn beetle habitat. The valley elderberry longhorn beetle life cycle is intimately connected to its habitat, elderberry shrubs. Following mating, the female lays her eggs in crevices in the elderberry bark. Upon hatching (after about 10 days), the larvae bore into the

pith of the shrub and feed inside stems larger than 1 inch in diameter for 1 to 2 years until they mature. They emerge during the spring as adults through exit holes chewed through the bark. The adult beetles feed on the elderberry foliage until they mate, completing the cycle. The BSA is not within designated critical habitat for the valley elderberry longhorn beetle. However, suitable habitat (i.e., elderberry shrubs) is present in the BSA and the beetle species has been documented approximately 0.03 mile west of the BSA. Thirty-eight elderberry shrubs with a minimum diameter of 1 inch at ground level were mapped within the BSA (Caltrans 2014k). No valley elderberry longhorn beetles were observed during survey, but potential beetle bore holes were observed, confirming the species' presence. The valley elderberry longhorn beetle is shown as threatened in the *Invertebrates* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Central Valley steelhead

The Central Valley steelhead (*Oncorhynchus mykiss*) is a Federally threatened species. The steelhead is an anadromous form of rainbow trout that migrates upstream from the ocean to spawn in late fall or early winter, when flows are sufficient to allow it to reach suitable habitat in far upstream areas. Steelhead typically spawn in gravel substrates located in clear, cool, perennial sections of relatively undisturbed streams, with dense canopy cover that provides shade, woody debris, and organic matter. Steelhead usually cannot survive long in pools or streams with water temperatures above 70 °F; however, they can use warmer habitats if adequate food is available. The NMFS has categorized steelhead into distinct population segments (DPS).

The Central Valley DPS, includes all naturally spawned anadromous steelhead populations below natural and manmade impassable barriers in the Sacramento and San Joaquin rivers and their tributaries, excluding steelhead from San Francisco and San Pablo Bays and their tributaries, as well as two artificial propagation programs: the Coleman National Fish Hatchery, and Feather River Hatchery steelhead hatchery programs. This species spawns in cool, moderately fast flowing water with gravel bottom. No critical habitat is present within the BSA. However, the Central Valley steelhead range overlaps the northeastern-most portion of the BSA (i.e., Ulatis and Alamo Creeks), and a winter steelhead distribution map produced by the CDFW indicates that anadromous steelhead were observed in 2004 in Alamo Creek and Ulatis Creek. Central valley steelhead is shown as threatened in the *Fish* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

Central California Coast steelhead

The Central California Coast steelhead, (*Oncorhynchus mykiss*), is a Federally threatened species. As discussed above for the Central Valley species, the Central California Coast steelhead is an anadromous form of rainbow trout categorized into a DPS. The Central

California Coast DPS consists of all runs from the Russian River in Sonoma County south to Aptos Creek in Santa Cruz County, including all steelhead spawning in streams that flow into the San Francisco Bay. This species requires cool streams with suitable spawning habitat and conditions allowing migration between spawning and marine habitats. No critical habitat for salmonids is present within the BSA. The Central California Coast steelhead range overlaps all but the northeastern-most portion of the BSA, and a winter steelhead distribution map produced by the CDFW indicates that anadromous steelhead were observed in 2004 in Jameson Canyon Creek, Green Valley Creek, and Suisun Valley Creek. In 2005, there were reports of steelhead being observed in Green Valley Creek and Suisun Valley Creek, with observations being made at several locations upstream of I-80 on Green Valley Creek. Central California coast steelhead is shown as threatened in the *Fish* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the NMFS and will be included in the forthcoming Biological Opinion.

California red-legged frog

The California red-legged frog, (*Rana draytonii*) is a Federally threatened species. The species inhabits perennial freshwater pools, streams, and ponds. The key to this species' occurrence in these habitats is the presence of perennial, or near perennial, water and a general lack of introduced aquatic predators.² Adults need dense shrubby or emergent riparian vegetation closely associated with deep (more than 2.3 feet) still or slow-moving water. Preferred breeding habitat consists of deep perennial pools with emergent vegetation for attaching egg clusters, as well as shallow benches to act as nurseries for juveniles. Non-breeding frogs may be found adjacent to streams and ponds in grasslands and woodlands as refugia. The species does not have a distinct breeding migration as some remain at breeding sites all year while others disperse. Movements may occur along riparian corridors, but some individuals move directly from one site to another through normally inhospitable habitats. The distance moved is highly site-dependent, as influenced by the local landscape. The USFWS considers 1 mile a typical dispersal distance for the species in its critical habitat designation.

The project BSA does not fall within designated critical habitat; however, the southwestern most end of the BSA is located immediately adjacent to critical habitat units Sol-1 and Sol-3 (see Appendix A of the NES). Suitable habitat is present, and one individual was observed during protocol-level red-legged frog surveys of the BSA on the westbound (northwest) side of I-80, in a ponded area of Jameson Canyon Creek (a culvert inlet flowing under I-80). In addition, there are 13 CNDDDB records of California red-legged frogs in Solano County, including a known California red-legged frog breeding pond located approximately 0.2 mile west northwest of the junction of SR 12 and I-80. This record is the northern-most record in Solano County.

² A perennial water body is one that keeps full or flowing water throughout the year.

As the dispersal distance of the California red-legged frog is approximately 1 mile, portions of the BSA located more than 1 mile north of the northern-most breeding pond or waterways hydrologically connected to this breeding pond are considered to be outside the range of the California red-legged frog. Thus, the species is presumed absent from the northeastern portion of the West Segment and the entire East Segment. This presumption is supported by the negative results of protocol-level red-legged frog surveys within those areas. Within the southwestern portion of the West Segment, where the species is presumed present, natural habitats in the median of I-80 are not considered habitat for the California red-legged frog. Heavily traveled roads are considered barriers to this species, with the exception that frogs may be able to pass under such roadways where underpasses or culverts are present. As such, the habitat within the BSA that is considered potential California red-legged frog habitat consists of natural land cover types (i.e., other than “developed”) that are located on the outer edges of the existing highway, and creeks/culverts that flow under I-80. California red-legged frog is shown as threatened in the *Amphibians* list in **Appendix J**, and effects to the species will be discussed in the Section 7 consultation described in *Regulatory Setting*. These effects are also described in the Biological Assessment that was submitted to the USFW and will be included in the forthcoming Biological Opinion.

Swainson’s hawk

The Swainson’s hawk is a California state threatened species. Swainson’s hawks in California are strongly associated with riparian habitats, though they are also found in oak woodlands and other open habitats. Prime breeding habitat for the Swainson’s hawk encompasses riparian draws or clumps of trees surrounded by open grassland or oak savannah for foraging. In the project region, Swainson’s hawks forage in dryland pasture and irrigated pasture, as well as row crops and grain crops, particularly during and after harvest, when prey are numerous and conspicuous. They are also attracted to flood irrigation areas, primarily in alfalfa fields, when prey take refuge on field margins. Swainson’s hawks build sturdy stick nests in low willows, box elders, oaks, or other trees, breeding from early March through July. Individuals frequently use the same nest or nest tree in successive breeding seasons or move. Suitable nesting and foraging habitat is present in the BSA and the species was recorded nesting within the BSA, north of Cherry Glen Road, in 2005 and in eucalyptus trees bordering Pine Tree Creek in 1996 through 2006.

No Swainson’s hawk nests were observed within the BSA during focused surveys conducted in 2012. However, suitable nest trees are present within the riparian woodlands and eucalyptus groves in both the East and West Segments. Swainson’s hawk were observed flying over the BSA during field surveys in September 2011 and April 2012, just east of the I-505/I-80 interchange. Further, there are two CNDDDB records of nesting Swainson’s hawks within the East Segment of the BSA: one pair nested in a eucalyptus tree north of Cherry Glenn Road (nest occupied 2004-2005); and a second pair nested in a eucalyptus tree bordering Pine Tree Creek near the Nut Tree Airport (nest occupied 1996-2006). However,

the highest densities of breeding Swainson's hawks in Solano County occur within irrigated agricultural areas in the north-central and northeastern portions of the County, and over 95 percent of all Swainson's hawk records in the County occur to the north and east of the BSA.

The CDFW defines an active Swainson's hawk nest as one that was used during one or more of the last five years. Based on this criterion, there are currently no known active nests within the BSA. The nearest active nest is the nest located east of Pleasants Valley Road. The BSA also includes 3.71 acres of row crops and 108.05 acres of nonnative annual grasslands that may serve as foraging habitat for the Swainson's hawk. However, Swainson's hawks have not been observed foraging within the BSA, and it is unlikely that Swainson's hawks forage frequently or in large numbers in the roadside areas within the BSA, given the abundance of suitable foraging habitat further away from I-80.

ENVIRONMENTAL CONSEQUENCES

Build Alternative

Valley elderberry longhorn beetles, California Valley and Central California Coast steelheads, California red-legged frogs, and Swainson's hawks may be adversely affected by the construction of the Build Alternative. Specific impacts for each of these species are detailed below. Construction activities would have temporary and permanent effects on various habitat types that provide upland, foraging, and dispersal habitats for these protected species. Proposed compensatory mitigation for impacts to each protected species is provided in the *Avoidance, Minimization, and Mitigation Measures* section presented further below. Final approved avoidance, minimization, and mitigation measures have been determined in consultation with the appropriate permitting agencies.

Valley elderberry longhorn beetle

The Build Alternative would not have any direct impacts on the valley elderberry longhorn beetle or its habitat through project design treatments and implementation of construction measures to avoid habitat. Indirect impacts to the species and/or habitat could occur if construction activities are conducted within 100 feet of the elderberry shrubs through dust generation, vehicle and equipment refueling, and herbicide use. Two of the 38 elderberry shrubs mapped within the BSA were determined to be located within 100 feet of project temporary impact areas. Implementation of the avoidance measures presented in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat due to indirect impacts from dust, soil compaction, and accidental spills. No compensatory mitigation is required. The project **may affect, but is not likely to adversely affect**, the valley elderberry longhorn beetle and will have no effect on critical habitat for this species.

Central Valley steelhead and Central California Coast steelhead

Direct and indirect impacts to the Central Valley steelhead and Central California Coast steelhead and their habitat would result due to loss or disturbance of, habitat as detailed

above for the Central Valley Fall-Run Chinook salmon in **Section 2.3.4, Animal Species**. The project **may affect, but is not likely to adversely affect**, the Central Valley steelhead and Central California Coast steelhead and will have no effect on critical habitat for these species. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below would avoid takes of, and impacts to, salmonids. No compensatory mitigation is required.

California red-legged frog

The Build Alternative could affect individual red-legged frogs as a result of the following:

- Direct injury or mortality during construction as a result of trampling by construction personnel or equipment;
- Direct injury or mortality from the collapse of underground burrows (which may be used as refugia in upland areas by red-legged frogs), resulting from soil compaction;
- Substrate vibrations may cause individuals to move out of refugia, exposing them to a greater risk of depredation or desiccation, may interfere with predator detection, and may result in a decrease in time spent foraging;
- Individuals that are found during pre-activity surveys and relocated to suitable habitat outside of the BSA may be subjected to physiological stress and greater risk of predation, or may undergo increased competition with other amphibians already present in the area to which they are relocated; and
- Reduction of suitable dispersal and foraging habitat resulting from the permanent loss of non-native annual grasslands and other upland habitats.

The project would not result in any impacts on suitable breeding habitat for the California red-legged frog, including perennial wetlands, perennial drainages, or seasonal wetlands within the species' range. The Build Alternative would impact up to 1.67 acres of potential red-legged frog foraging and dispersal habitat, all located within the West Segment. It is assumed that red-legged frogs could occur virtually anywhere in the portion of the BSA within the species' range, all impacted natural habitats (i.e., areas that were not already paved or otherwise developed) within this range, and that were not located within the highway median were considered impacted red-legged frog habitat. The project **may affect, and is likely to adversely affect**, the California red-legged frog.

Permanent Impacts

Approximately 0.04 acre of potential red-legged frog dispersal habitat would be permanently lost due to the construction of pavement and other hardscape in areas that currently provide natural habitat that may be used by red-legged frogs. This permanently impacted habitat consists of coyote brush scrub, non-native annual grassland, and ruderal habitats along the edge of the freeway.

Temporary Impacts

Approximately 1.62 acres of potential red-legged frog habitat, including aquatic habitat for foraging and upland/riparian habitat for cover and dispersal, would be used for temporary construction access and staging while the project is being constructed or would be impacted by grading (cut/fill) activities as part of the project. Areas used for construction access and staging would not be paved or otherwise permanently altered. These areas are expected to provide habitat of similar quality to existing conditions shortly (i.e., in less than one year) after the completion of construction. Areas that would be temporarily impacted by grading would be revegetated following the completion of construction; such areas are expected to provide habitat of similar quality to the existing habitat that would be impacted, from the perspective of California red-legged frogs, within approximately one year after the completion of construction.

Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below will minimize impacts on individuals and their habitat during construction. Compensatory mitigation is proposed to mitigate for any permanent loss of the California red-legged frog dispersal or foraging habitat.

Swainson's hawk

The Build Alternative is not expected to result in impacts on high quality Swainson's hawk foraging habitat (e.g., open agricultural fields and pastures) due to the proximity of I-80. The BSA represents a very small fraction of the total foraging habitat available to this species in the region. No row crops and only 2.67 acres of non-native grasslands (i.e., potentially suitable foraging habitat) would be permanently impacted by the project. This represents less than 0.01 percent of the foraging habitat available within 10 miles of the nearest active nest. Therefore, the Build Alternative **is not expected** to reduce this species' populations or reproduction potential in any way, and any project impacts would be minimal. Avoidance measures as provided in the *Avoidance, Minimization, and Mitigation Measures* section presented below would avoid take of, and impacts to, Swainson's hawks, including eggs and young. Therefore, no compensatory mitigation is required.

West Segment –Fundable First Phase

Adverse effects to the protected species described above for the Build Alternative are applicable to West and East Segments. As previously discussed, the distribution of suitable habitat types within the BSA varies dependent on the characteristics and needs of the animal species. California red-legged frog habitat is only present within the West Segment of the Build Alternative. As such, the West Segment of the Build Alternative is expected to have slightly higher direct and indirect effects to habitats that support protected animal species when compare to the East Segment.

No-Build Alternative

Under the No-Build Alternative, there would be no changes to I-80 within the project limits. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lanes would be constructed. No bridge structures would be widened or replaced. As such, the No-Build Alternative would not result in impacts to biological resources. Implementation of the currently planned and funded transportation projects outside the BSA but within the project region would be subject to the same potential presence of threatened and endangered animal species as the Build Alternative, since they would occur in the same general region. These projects would be required to comply with the USFWS and CDFW requirements regarding protected animal species, should those species be identified within areas that would be directly or indirectly affected. The potential presence of threatened and endangered animal species in areas outside of the BSA would be determined under separate environmental review.

Formal Consultation

Caltrans initiates consultation with USFWS when a project has the potential to affect a federally listed species. Formal consultation with USFWS under FESA was initiated with the submission of a Biological Assessment (BA) prepared for the project for the valley elderberry longhorn, Central Valley steelhead, Central California Coast steelhead, and California red-legged frog. A Biological Opinion (BO) was obtained from the USFWS on August 17, 2015.

CESA generally parallels the main provisions of FESA, but extends the take prohibitions to species proposed for listing. Section 2080 of California Fish and Game Code prohibits the take (defined as hunting, pursuing, catching, capturing, or killing) of endangered, threatened, or candidate species unless otherwise authorized by permit. CESA allows for take incidental to otherwise lawful development projects except for those species listed as fully protected. State lead agencies are required to consult with CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any listed or candidate species or result in destruction or adverse modification of essential habitat.

The project has the potential to affect the one species listed under CESA: Swainson's hawk. However, with implementation of **Measure BIO-30**, an Incidental Take Permit (ITP) from the CDFW is not expected to be needed.

Caltrans also initiates consultation with the National Marine Fisheries Service (NMFS) when a project has the potential to affect a federally listed anadromous fish species and/or adversely affect designated critical habitat. As the project has the potential to affect Central Valley steelhead and Central California Coast steelhead, federally listed anadromous fish, informal consultation with the NMFS was initiated in March 2015 with the submission of a BA prepared for the project. The NMFS agreed that because the project did not propose pile driving, there would be no likely impacts to the Central Valley steelhead and Central California Coast steelhead. Accordingly, NMFS agreed that under the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in

Caltrans' Districts 1, 2, and 4 issued to Caltrans by NOAA, the project is covered under Category 3. As such, no further opinion was needed.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Build Alternative

Biological Opinion

The Biological Opinion describes measures that must be taken to avoid, minimize, or mitigate effects to federally listed species. **Measure BIO-32, Compliance with Biological Opinion**, states that Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking. Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions. Implementation of this measure will ensure that required consultation and concurrence with the USFWS is obtained prior to construction

Valley elderberry longhorn beetle

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures**, below would reduce the potential for adverse effects to the valley elderberry longhorn beetle during project construction. These measures include worker environmental training (**Measure BIO-3**), barrier fencing to protect habitat at specified buffer zones (**Measures BIO- 24 and BIO-25**), erosion control and re-vegetation of buffer zones (**Measure BIO-26**), use prohibition of harmful chemicals within specified distance of habitat (**Measure BIO-27**), and a dust control program (**Measure BIO-28**).

Central valley steelhead and Central California coast steelhead

Water quality during construction and project operation would be protected by BMPs that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures HYDR-1 and WQ-2 and Section 2.3.7 Avoidance and Minimization Measures and Project Mitigation Measures**, below), for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA are maintained for the special-status species that could be present in these aquatic habitats. Additionally **Measure BIO-3, BIO-4, BIO-5, BIO-6, BIO-7, and BIO-8** as detailed in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below include provisions on worker environmental training, construction to avoid takes, disturbances or injury of the Central valley steelhead and the Central California coast steelhead, habitat protection, and biological monitoring. The

project will also implement all applicable Additional BMPs (ABMPs) as specified in the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 (NOAA 2013).

California red-legged frog

The avoidance and minimization measures listed in **Section 2.3.7, Avoidance and Minimization Measures**, will reduce the potential for effects to California red-legged frogs during project construction. These measures include biological monitoring worker environmental awareness training, pre-construction surveys, relocation plan, construction material and storage inspections, and exotic species control by a qualified biologist (**Measure BIO-28**).

Water quality during construction and project operation would be protected by BMPs and other measures that would be developed approved prior to construction (see **Section 2.2.2, Water Quality, Measures HYDR-1, WQ-1, BIO-1, and BIO-2**). Implementation of these measures would ensure that the natural beneficial values of the waterways within the BSA were maintained for California red-legged frogs that could be present in or near this aquatic habitat.

Mitigation Measure BIO-F: Compensatory Mitigation for the California Red-Legged Frog. Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 3:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.05 acres of habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference:

- Establishment of a conservation easement for habitat used for California red-legged frog dispersal.
- Purchase of USFWS-approved banking credits for upland dispersal habitat.
- Provide funds to conservation group for aid and support of California red-legged frog conservation.

Swainson's hawk

The avoidance and minimization efforts described in **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**, below would reduce the potential for adverse effects to the Swainson's hawk during project construction. These measures include timing of construction activities outside nesting periods, pre-construction surveys, disturbance free buffer zones, and biological monitoring (**Measure BIO-30**).

West Segment - Fundable First Phase

Avoidance, minimization, and mitigation measures described above for the Build Alternative are applicable to the East and West Segments. Certain impacts are more prevalent in the West Segment of the Build Alternative because of the distribution of suitable habitat for protected species. Where applicable, the avoidance and minimization measures specify the locations in which the measures should be applied (i.e., measures that dictate compensatory mitigation related to California red-legged frogs are thereby only applicable to West Segment of the project).

2.3.6 INVASIVE SPECIES

REGULATORY SETTING

On February 3, 1999, President William J. Clinton signed Executive Order (EO) 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health.” Federal Highway Administration (FHWA) guidance issued August 10, 1999 directs the use of the State’s invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a proposed project.

AFFECTED ENVIRONMENT

The following analysis is based on the NES prepared for the project (Caltrans, 2014k). Several invasive plant species were observed within or adjacent to the BSA (**Table 2.3-6**). These species included understory invaders such ripgut brome and milk thistle, and shrub invaders such as Himalayan blackberry.

Table 2.3-6 List of Invasive Plant Species Observed in the BSA and the California Invasive Plant Council Ratings.

Common Name	Scientific Name	Rating*	Common Name	Scientific Name
Tree-of-heaven	<i>Ailanthus altissima</i>	Moderate	Tree-of-heaven	<i>Ailanthus altissima</i>
Giant reed	<i>Arundo donax</i>	High	Giant reed	<i>Arundo donax</i>
Black mustard	<i>Brassica nigra</i>	Moderate	Black mustard	<i>Brassica nigra</i>
Field mustard	<i>Brassica rapa</i>	Limited	Field mustard	<i>Brassica rapa</i>
Ripgut brome	<i>Bromus diandrus</i>	Moderate	Ripgut brome	<i>Bromus diandrus</i>
Soft chess	<i>Bromus hordeaceus</i>	Limited	Soft chess	<i>Bromus hordeaceus</i>
Red brome	<i>Bromus madritensis</i>	High	Red brome	<i>Bromus madritensis</i>

Common Name	Scientific Name	Rating*	Common Name	Scientific Name
Italian thistle	<i>Carduus pycnocephalus</i>	Moderate	Italian thistle	<i>Carduus pycnocephalus</i>
Highway iceplant	<i>Carpobrotus edulis</i>	High	Highway iceplant	<i>Carpobrotus edulis</i>
Yellow star-thistle	<i>Centaurea solstitialis</i>	High	Yellow star-thistle	<i>Centaurea solstitialis</i>
Squarrose knapweed	<i>Centaurea virgata</i> var. <i>squarrosa</i>	Moderate	Squarrose knapweed	<i>Centaurea virgata</i> var. <i>squarrosa</i>
Poison hemlock	<i>Conium maculatum</i>	Moderate	poison hemlock	<i>Conium maculatum</i>
Bull thistle	<i>Cirsium vulgare</i>	Moderate	Bull thistle	<i>Cirsium vulgare</i>
Pampasgrass	<i>Cortaderia jubata</i>	High	Pampasgrass	<i>Cortaderia jubata</i>
Silverleaf	<i>Cotoneaster pannosus</i>	Moderate	Silverleaf	<i>Cotoneaster pannosus</i>
Artichoke thistle	<i>Cynara cardunculus</i>	Moderate	Artichoke thistle	<i>Cynara cardunculus</i>
Bermuda grass	<i>Cynodon dactylon</i>	Moderate	Bermuda grass	<i>Cynodon dactylon</i>
Annual dogtail	<i>Cynosurus echinatus</i>	Moderate	Annual dogtail	<i>Cynosurus echinatus</i>

Source: Caltrans 2014k

ENVIRONMENTAL CONSEQUENCES

Build Alternative

The project is not expected to result in a substantial increase in invasive species within the BSA due to the limited disturbance that would occur outside of the highly disturbed areas of the I-80 corridor. However, some grading and temporary staging areas would be located within natural habitats adjacent to the freeway. Therefore, care must be taken to limit the effects of site disturbance. All areas temporarily disturbed by vegetation removal, grading, construction access, and bridge and road modifications would be seeded with a native seed mixture that would help prevent erosion and also would increase the amount of native species within the herbaceous layer of the existing habitats. Invasive species, particularly fast-growing herbaceous invaders, are often disturbance-adapted, and soil disturbance (an effect expected for this construction project) will often be followed by an invasion of the disturbed area by these species. However, areas that will be affected by project activities will be seeded and planted with native species. Therefore, project-related effects are not expected to cause an increase in invasive species populations within the BSA.

West Segment

The minimal effects related to invasive species for the Build Alternative are applicable to the West Segment.

No-Build Alternative

The No-Build Alternative will make no physical or operational improvements to I-80 or the connecting roadways within the BSA. Implementation of the currently planned and funded projects outside the BSA but within Solano County will have the same potential to introduce or spread invasive species into currently un-infested areas. Transportation projects will be subject to the same avoidance measures prescribed by Caltrans and EO 13112, thereby reducing potential adverse effects related to the spread of invasive species.

AVOIDANCE, MINIMIZATION, AND/OR MITIGATION MEASURES

Project activities are not expected to cause an increase in invasive species populations within the study area, thus no avoidance measures or compensatory mitigation is warranted for this species.

2.3.7 AVOIDANCE AND MINIMIZATION MEASURES AND PROJECT MITIGATION MEASURES

AVOIDANCE AND MINIMIZATION MEASURES

To avoid and minimize effects to sensitive species and their habitats within the BSA, Caltrans would implement the general avoidance and minimization measures described below. The measures would be included as part of the special provisions of the construction bid package as measures that would be implemented during construction. These measures apply to all of the proposed improvements under the Build Alternative, including the East and West Segments. These measures will include minimizing the area of impact, installing wildlife exclusion fencing, implementing work windows, conducting environmental education for the construction crews, conducting preconstruction surveys, requiring presence of an on-site biological monitor during designated periods, and other construction-site best management practices (BMPs).

Measure BIO-1: Orange construction barrier fencing will be installed to identify ESAs, including oak and riparian woodlands, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction

activities are initiated, maintained throughout the construction period, and be removed after completion of construction.

Measure BIO-2: The following Caltrans standard BMP's shall be implemented during construction to avoid or minimize impacts on aquatic habitats:

- All work within the banks of an active channel will be restricted to the dry season (June 1–October 15).
- Orange construction barrier fencing will be installed to identify environmentally sensitive areas (ESAs), including aquatic and wetland habitat, present within the BSA but that are to be avoided by project activities. A qualified biologist will identify sensitive biological resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans.
- Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and removed only after completion of construction.
- Caltrans will implement BMPs as recommended or required by the State Water Quality Control Board to protect water quality. These measures will include, but are not limited to the following:
 - No debris, soil, silt, sand, bark, slash, sawdust, cement, concrete, washings, petroleum products or other organic or earthen material will be allowed to enter into or be placed where it may be washed by rainfall or runoff into waters of the U.S./State or aquatic habitat.
 - No equipment will be operated in the live stream channel.
 - Equipment staging and parking areas will occur within established access areas in upland habitat above the top of bank.
 - Machinery or vehicle refueling, washing, and maintenance will occur at least 60 feet from the top-of-bank. Equipment will be regularly maintained to prevent fluid leaks. Any leaks will be captured in containers until the equipment is moved to a repair location.

- A spill prevention and response plan will be prepared prior to construction and will be implemented immediately for cleanup of fluid or hazardous materials spills.
- Standard erosion control and slope stabilization measures will be required for work performed in any area where erosion could lead to sedimentation of a water body.
- Caltrans will provide a dewatering and diversion plan for agency approval as needed.

Measure BIO-3. A Worker Environmental Awareness Training (WEAT) program will be given by a qualified biologist before the onset of to explain to construction personnel how best to avoid the accidental take of steelhead and Chinook salmon and the valley elderberry longhorn beetle. The biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

Measure BIO-4. All work within a low-flow channel associated with the construction of the Ulatis and Horse creek bridge modifications will occur during the dry season (June 1 to October 15). During this time, drainage flows in Ulatis and Horse creeks are expected to be at annual lows, and it is possible that the drainages may be completely dry; during this time, steelhead and Chinook are expected to be absent from the reaches of Ulatis and Horse creeks within the BSA.

Measure BIO-5. When work in a flowing stream is unavoidable and before work commences, any stream flow will be diverted around the work area by a barrier/cofferdam, temporary culvert, or a new channel capable of permitting upstream and downstream fish movement. The material used to construct the cofferdams will be clean material, contained, for example in sacks, and placed over plastic or filter fabric (or like material) so it can be completely removed from the streambed and preserve existing riverbed substrate. Construction of the barrier/cofferdam or the new channel will normally begin in the downstream area and continue in an upstream direction and the flow will be diverted only when construction of the diversion is completed.

Measure BIO-6. During construction activities that involve physical modification of any bridge over aquatic habitat, netting or other structures will be installed under the existing bridge to prevent debris from entering the channel, as such debris could degrade water quality downstream and potentially injure steelhead or Chinook salmon (e.g., when work on the bridge deck is occurring during the wet season).

Measure BIO-7. If flow is present in the drainage when in-water construction is scheduled to occur, a qualified biologist will be present to monitor all activities involving the placement of fill in the drainage, including any cofferdam construction. The biologist will inspect the area where the cofferdam will be constructed prior to construction and will ensure that any fish have vacated the cofferdam area before in-water work begins. A water diversion plan will be developed and submitted to resource agencies prior to construction start. Once all fish have moved out of the work area, the cofferdam will be completed so that fish cannot re-enter this area.

Measure BIO-8. If at any time an individual steelhead or Chinook salmon appears to be at risk of injury or mortality due to project-related activities, all work will stop until Caltrans has consulted with NMFS to determine a means of avoiding impacts on the individual(s).

Measure BIO-9. In order to avoid and minimize project impacts on badgers, a qualified mammalogist will conduct pre-construction surveys for badger dens non-native annual grassland throughout the BSA, within two weeks prior to groundbreaking. Because badger dens, if present, are most likely to occur in open grassland and ruderal habitats, this survey could be conducted in conjunction with the preconstruction survey for burrowing owls.

Measure BIO-10. If an active badger maternity den is located, the mammalogist will determine the size of a construction-free buffer that will be maintained around the den to avoid impacts on the den during the pupping season (i.e., February 15 through July 1, or as otherwise determined through surveys and monitoring of the den), in consultation with the CDFW.

Measure BIO-11. If an active den is found outside of the pupping season, the badger will be evicted by excavation of the den using hand tools, in consultation with the CDFW and under the supervision of a qualified biologist. These precautionary measures will ensure that no active pupping dens are impacted by the project.

Measure BIO-12. A qualified biologist will conduct a pre-construction survey for western pond turtles and their nests. If a western pond turtle is found in an area where it could be injured or killed by project activities, the qualified biologist will relocate the turtle to an appropriate site outside the project area.

Measure BIO-13. If an active western pond turtle nest is detected within the activity area, a 25-foot buffer zone around the nest will be established and maintained during the nesting season (April 1 through August 31). The buffer zone will remain in place until the young have left the nest, as determined by a qualified biologist.

Measure BIO-14. Following the initial survey, a qualified biologist will conduct a survey of the aquatic habitat within the activity area each morning prior to the onset of construction activities. If a turtle is located, all work in the vicinity will immediately cease, and a qualified biologist will be contacted. Work within the area will not resume until the turtle has been relocated or has moved out of the area where it could be impacted.

Measure BIO-15. Work within 100 feet of bridges/crossings identified in Table 9 of Caltrans 2014i as providing suitable bat day roosting habitat (i.e., Laguna Creek Bridge and Soda Springs Culvert) will be avoided during the maternity season (April 1 through July 31) to the extent feasible. Outside of the maternity season, when construction activities will occur within 100 feet of the roost, the bats may be habituated enough to noise and vibration that they may tolerate the work activities and not abandon the roost. Those bats that cannot tolerate this disturbance are expected to leave the roost, dispersing to other roost habitat in the vicinity (e.g., other bridges). However, based on the bats' obvious habituation to noise and vibrations associated with existing traffic, impacts on the colony will be lower if the bats are allowed to decide whether to abandon based on their own level of tolerance than if the bats are evicted prior to work, which is assured of causing the abandonment of the entire colony. As a result, no eviction of bats is proposed for work conducted outside of the maternity season. Performing work outside of the maternity season will ensure that no non-flying young are abandoned or harmed during work activities. Further, in case the bats do disperse from the bridge when work commences, all work activities involving jackhammering within 100 feet of the roost will commence in the evening, after sunset, in order to minimize the risk of predation of bats leaving the roost. If work within 100 feet of potential day roosts sites during the maternity season cannot be avoided, the following measures will be implemented.

Measure BIO-16. If jackhammering or other ground-disturbing activities will occur on the freeway immediately above a potential day roost, bats will be safely evicted from the potential roost site under the direction of a qualified bat biologist. Eviction activities will be performed prior to the breeding season (i.e. April 1) in the year in which project activities are scheduled to occur. Eviction of bats will occur at night to decrease the likelihood of predation (compared to eviction during the day). Evictions will occur between September 1 and March 32, outside the maternity season, but will not occur during long periods of inclement or cold weather (as determined by the bat biologist) when prey are not available or bats are in torpor. Following eviction, bat exclusion devices will be installed to prevent bats from taking up occupancy of the structure prior to the onset of the proposed activity.

Measure BIO-17. If jackhammering or other ground-disturbing activities will not occur on the freeway immediately above the roost but will occur within 100 feet of the roost, a qualified bat biologist will determine whether the bats will be evicted, using the methods outlined in **BIO-15** and **BIO-16**, on a case-by-case basis depending on the level of disturbance that is proposed.

Measure BIO-18. Pre-construction surveys for burrowing owls will be conducted in potential habitat in conformance with the CDFW's 2012 protocol (CDFW 2012).

Measure BIO-19. If burrowing owls are present during the nonbreeding season, (generally 1 September 1 to January 31), the approved biologist will establish a protective buffer zone in coordination with resource agencies. During the breeding season (generally 1 February 1 to August 31), a 250-foot buffer, within which no new project-related activities will be permissible, will be maintained between project activities and occupied nests. Owls present

between February 1 and August 31 will be assumed to be nesting unless monitoring evidence indicates that the owls are no longer nesting, or the young owls are foraging independently, or only a single owl (rather than a breeding pair) is present after 1 July and there is no evidence that young owls are present, in which case the buffer may be reduced or the owls may be relocated prior to August 31, in consultation with the CDFW.

Measure BIO-20. If construction will directly impact occupied burrows, eviction of owls will occur in coordination with the regulatory agencies.

Measure BIO-21. If vegetation is to be removed by the project, potential nesting substrate (e.g., bushes, trees, snags, grass, and suitable artificial surfaces) that will be disturbed should be removed during the nonbreeding season (i.e., they should be removed between September 1 and February 14), if feasible, to help preclude nesting. If it is not feasible to schedule vegetation removal during the nonbreeding season, then pre-construction surveys for nesting birds will be conducted by a qualified biologist to ensure that no nests will be disturbed during project implementation. This survey will be conducted no more than seven days prior to the initiation of construction activities. During this survey, the ornithologist will inspect all trees, shrubs, and other potential nesting habitats in and immediately adjacent to the BSA for nests. If an active nest is found sufficiently close to work areas to be disturbed by these activities, the biologist, in consultation with the CDFW, will determine the extent of a buffer zone to be established around the nest, typically 300 feet for raptors and 50 feet for other birds, to ensure that no nests of species protected by the MBTA or the California Fish and Game Code will be disturbed during project implementation.

Measure BIO-22. Alternatively, nest starts may be removed on a regular basis (e.g., every second or third day), starting in late January or early February, or measures such as exclusion netting may be placed over the existing bridges to prevent active nests (i.e., nests with eggs or young) from becoming established. Netting needs to be installed by an experienced deterrence contractor and be well maintained to prevent entanglement or entrapment of birds.

Measure BIO-23. Because the entire BSA is already subject to disturbance by vehicles, activities that will be prohibited from occurring within the buffer zone around a nest will be determined on a case-by-case basis. In general, activities prohibited within such a buffer while a nest is active will be limited to new construction-related activities (i.e., activities that were not ongoing when the nest was constructed) involving significantly greater noise, human presence, or vibrations than were present prior to nest initiation.

Measure BIO-24. Before any ground-disturbing activity, orange construction barrier fencing will be installed to identify ESAs, including elderberry shrubs, present within the BSA but that are to be avoided (i.e., no ground disturbance activities will occur within 20 feet of the two shrubs present within 100 feet of project impact areas) by project activities. The fencing will be installed at least 20 feet from the driplines of all elderberry shrubs on which direct impacts will be completely avoided. A qualified biologist will identify sensitive biological

resources adjacent to the construction area before the final design plans are prepared so that the areas to be fenced can be included in the plans.

Measure BIO-25. Temporary fences around the ESAs will be installed as one of the first orders of work in accordance with Caltrans specifications. Before construction, the construction contractor will work with the project engineer and a resource specialist to identify the locations for the barrier fencing and will place stakes around the sensitive resource sites to indicate these locations. The protected areas will be designated as ESAs and identified clearly on the construction plans. The fencing will be installed before construction activities are initiated, maintained throughout the construction period, and be removed after completion of construction.

Measure BIO-26. Any damage to the buffer area during construction will be restored following construction. Restoration will include erosion control and re-vegetation with native plants as appropriate.

Measure BIO-27. No insecticides, herbicides, fertilizers, or other chemicals that might harm the beetle or its host plant will be used within 100 feet of any elderberry plant with one or more stems measuring 1.0 inch or greater in diameter at ground level.

Measure BIO-28. Caltrans will include provisions in the construction bid documents that the contractor will implement a dust control program to limit fugitive dust emissions. The dust control program may include, but not be limited, to the following elements, as appropriate:

- Water active construction sites at least twice daily.
- Pursuant to California Vehicle Code, Section 23114 (State of California 2004), all trucks hauling soil and other loose material to and from the construction site will be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of load and the trailer).
- Exposed stockpiles of soil and other backfill material will be enclosed or covered, and watered twice daily or have soil binders added.
- Any topsoil that is removed for the construction operation will be stored on-site in piles not to exceed 4 feet in height. These topsoil piles will be clearly marked and flagged. Topsoil piles that will not be immediately returned to use will be revegetated with a non-persistent erosion control mixture.

Measure BIO-29. Caltrans will submit to the USFWS the name(s) and credentials of biologists who would conduct activities related to the California red-legged frog specified in the following measures:

- A WEAT program will be given by an approved biologist before the onset of construction within potential California red-legged frog habitat to explain to construction personnel how best to avoid the accidental take of red-legged frogs. The

biologist will conduct a training session that will be scheduled as a mandatory informational field meeting for contractors and all construction personnel. Handouts, illustrations, photographs, and/or project mapping showing areas where minimization and avoidance measures are being implemented will be included as part of this worker awareness program. Upon completion of the program, employees will sign a form stating that they attended the training session and understand all the conservation and protection measures.

- Prior to the initiation of the pre-construction survey, a relocation plan for any California red-legged frogs found on the project site will be submitted to the USFWS for approval.
- The approved biologist will perform pre-construction surveys.
- A USFWS-approved biologist will be present at all times during initial disturbance of potential red-legged frog habitat to monitor for red-legged frogs.
- All construction pipes, culverts, or similar structures that are stored at the site within suitable red-legged frog habitat for one or more overnight periods will be either securely capped prior to storage or thoroughly inspected by the approved biologist or on-site monitor before the pipe is subsequently buried, capped, or otherwise used or moved in any way. If a California red-legged frog is discovered inside a pipe, the approved biologist will move the animal to an approved location, as described above.
- During project activities, all trash that may attract predators will be properly contained, removed from the work site, and disposed of regularly. Following construction, all trash and construction debris will be removed from work areas.
- A qualified biologist will permanently remove any individuals of exotic species.

Measure BIO-30. If construction-related work is conducted outside the nesting period (February 1 through August 31), potential impacts on active nests of Swainson's hawks will be avoided. If it is not feasible to schedule construction during the nonbreeding season, the following measures will be implemented.

- A pre-construction survey for nesting Swainson's hawks within 0.25 miles of the BSA will be conducted within 15 days prior to the initiation of construction activities; this survey will be conducted by a qualified biologist. If an active Swainson's hawk nest is detected, the following measure will be implemented.
 - To reduce the potential for Swainson's hawks to abandon their nest or territory due to construction disturbance during their reproductive period, if nesting Swainson's hawks are present, a buffer free from new disturbance will be established within a 600-foot radius of the nest. No new project-related activities (i.e., activities that were not already ongoing when the nest was established, or that are of a substantially greater intensity than when the nest was established)

will be undertaken within the buffer. In some cases (e.g., if the construction is not visible from the nest site), it is possible that a lesser buffer would be adequate to avoid disturbance of the nesting Swainson's hawks, but such a variance would require approval of the CDFW. In such a case, the biologist and agency personnel will agree on a reduced buffer, and the biologist will monitor the behavior of the nesting birds during the two days immediately prior to the onset of construction activities within 0.25 miles of the nest to establish a behavioral baseline. The biologist will also monitor the behavior of the nesting birds during the first full day of construction activity within 0.25 miles of the nest. The biologist will look for signs of stress such as repeated alarm calls, agitated behavior, or departure of the birds from the nest. If the birds do not show signs of habituation to the new disturbance by resuming their normal nesting activities, work within the vicinity of the nest will stop and the CDFW will be consulted to refine the buffer determination. If the birds continue their normal activities, the biologist will inspect the nest site every one to two days (the frequency determined in consultation with the CDFW) for as long as the nest is active and work is ongoing within the reduced buffer to confirm that the birds are tolerant of the construction activities. Any required buffer will remain in place until young are no longer dependent on the nest, or until the nesting attempt fails (for reasons other than project activities) and it is determined that the birds will not attempt to re-nest. A qualified biologist will determine through direct observation when the nest is no longer in use (e.g., if the young have fledged or the nesting fails for non-project-related reasons). Constant monitoring of the nest is not necessary, but before construction activities occur within the agreed-upon buffer, the biologist must have confirmed that the nest is no longer active.

Measure BIO-31. In compliance with the Executive Order on Invasive Species, EO 13112, and guidance from the Federal Highway Administration (FHWA), the landscaping and erosion control included in the project will not use species listed as invasive.

In areas of particular sensitivity, extra precautions will be taken if invasive species are found in or next to the construction areas. These include the inspection and cleaning of construction equipment and eradication strategies to be implemented should an invasion occur.

Measure BIO-32: Compliance with the Biological Opinion. Caltrans will include a copy of the biological opinion within its solicitations for design and construction of the proposed project, making the primary contractor aware of all requirements and obligations included within the biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. The Resident Engineer or their designee will be responsible for implementing the Conservation Measures and Terms and Conditions of the biological opinion. The Resident Engineer or their designee will maintain a copy of the biological opinion onsite whenever construction is taking place. Their name and telephone number will be provided to the USFWS at least 30 calendar days prior to groundbreaking.

Prior to ground breaking, the Resident Engineer will submit a letter to the USFWS verifying that they possess a copy of the biological opinion and have read the Terms and Conditions.

MITIGATION MEASURES

Compensatory mitigation as described below will minimize adverse effects to natural communities, wetlands and other waters, animal species, and threatened and endangered species to a negligible level. A portion of the overall mitigation acreage requirements will be satisfied by restoring temporarily impacted areas (on-site mitigation). The remaining acreage requirement will be satisfied either through purchase of credits if necessary at an approved mitigation bank, or through off-site mitigation. Since some species have similar habitat requirements, some mitigation acreage may be considered as having value for several species, and consequently would be applied as multi-species conservation credits when tracking Caltrans' fulfillment of the proposed mitigation.

Mitigation Measure BIO-A: Compensatory Mitigation for Oak Woodlands Replacement.

Compensation for impacts to 1.35 acres of oak woodland habitat will be mitigated at a replacement ratio of 2:1 within the BSA and, if needed, outside the BSA. An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. If the replacement of oak woodland habitat cannot be implemented within the BSA, or there is not a sufficient area to mitigate oak woodland tree and shrub impacts, as determined by Caltrans, acreage for oak woodland plantings will be acquired within the vicinity of the project.

Mitigation Measure BIO-B: Compensatory Mitigation for Oak Woodlands Habitat

Mitigation and Monitoring Plan. Prior to issuance of a grading permit, Caltrans will prepare an Oak Woodland Habitat Mitigation & Monitoring Plan (HMMP) for oak woodland habitat creation. An open space or conservation easement, or other similar instrument, will be recorded on property associated with the mitigation lands to protect the created habitats' plant and wildlife resources in perpetuity. The Oak Woodland HMMP will be prepared by a qualified restoration ecologist and will provide, at a minimum, the following items:

- Habitat impacts summary and proposed habitat mitigation actions
- Goals of the restoration to achieve no net loss
- The location of the mitigation sites and existing site conditions
- Mitigation design including:
 - Proposed site construction schedule

- Description of existing and proposed soils, hydrology, geomorphology and geotechnical stability
- Site preparation and grading plan
- Invasive species eradication plan, if applicable
- Soil amendments and other site preparation
- Planting plan (plant procurement/propagation/installation)
- Maintenance plan
- Monitoring measures, performance and success criteria
- Monitoring methods, duration, and schedule
- Contingency measures and remedial actions
- Reporting measures

Mitigation Measure BIO-C: Compensatory Mitigation for Aquatic and Wetland Restoration. Compensation for permanent impacts up to 0.17 acre of aquatic and wetland habitat will be mitigated at a replacement ratio of 1:1 (created wetlands: impacted wetlands) based on square footage offsite . These effects may be mitigated at a USACE-approved wetland mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turn-key mitigation property located in close proximity to the project, such as Grizzly Bay Preserve. Temporary impacts on 1.23 acre of aquatic habitat (i.e. impacted areas not previously mitigated) will be mitigated on-site by restoring impacted areas to pre-project conditions.

Mitigation Measure BIO-D: Compensatory Mitigation for Riparian Woodland Replacement. Compensation for permanent impacts to up to 0.03 acre of riparian habitat will be mitigated at a replacement ratio of 3:1 (habitat replaced: habitat lost) based on acreage offsite . These effects may be mitigated at a CDFW-approved riparian mitigation bank with a service area that covers the project, such as the Elsie Gridley mitigation bank, or at a turnkey mitigation property located in close proximity to the project, such as Grizzly Bay Preserve.

Mitigation Measure BIO-E: Compensatory Mitigation for the Burrowing Owl. Compensatory mitigation will be provided in the form of habitat preservation and/or management if burrowing owls are located in the BSA during pre-construction surveys. The loss of foraging and nesting habitat in the project construction area will be offset by acquiring and permanently protecting suitable foraging and breeding habitat.

Mitigation Measure BIO-F: Compensatory Mitigation for the California Red-Legged Frog. Caltrans will mitigate for any permanent loss of California red-legged frog dispersal or foraging habitat at a 3:1 ratio (mitigation : impact) and any temporary loss of dispersal and foraging habitat at a 1:1 ratio on an acreage basis, estimated at approximately 1.05 acre of

habitat to be preserved. Compensatory mitigation may be carried out through purchasing credits at a habitat mitigation bank and/or one or both of the following methods, in order of preference:

- Establishment of a conservation easement for habitat used for California red-legged frog dispersal.
- Purchase of USFWS-approved banking credits for upland dispersal habitat.
- Provide funds to conservation group for aid and support of California red-legged frog conservation.

Final mitigation requirements are subject to formal consultation and permitting by the regulatory agencies.

2.4 CUMULATIVE IMPACTS

2.4.1 REGULATORY SETTING

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

Cumulative impacts to resources in the project limits may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

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

2.4.2 CUMULATIVE IMPACTS

This cumulative analysis determines whether the Build Alternative in combination with other approved or foreseeable projects would result in a cumulative effect, and, if so, whether the Build Alternative's contribution to the cumulative impact would be considerable. Reasonably foreseeable future projects include land use developments and other transportation improvements that are planned and funded and would be located near the proposed Build Alternative improvements.

Under the No-Build Alternative, no changes to the I-80 freeway within the project limits would occur as a result of project implementation. The freeway travel lanes along the I-80 corridor would remain as they currently exist and no express lane would be constructed. As such, the No-Build Alternative would not contribute to any cumulative effects, and is not discussed further in this analysis.

METHODOLOGY

The following two methods were used to evaluate whether the Build Alternative would have a considerable contribution to a significant cumulative effect:

1. Projects to consider in the cumulative analysis include any past, present, and probable future projects producing related or cumulative impacts, including projects outside the control of the lead agency, or
2. The cumulative analysis would consider projections contained in an adopted local, regional, or statewide plan, or would use a prior environmental document which has been adopted or certified for such a plan.

For the majority of this analysis the second method was used, based on the City of Vacaville General Plan and City of Fairfield General Plan and associated EIRs. Where indicated, the cumulative analysis is enhanced through the consideration of specific individual projects identified from a list compiled from both the Cities of Vacaville and Fairfield.

As discussed in **Section 2.1.1, Land Use**, the predominant type of planned land use development in the area is residential. Other development projects planned in the area include commercial and industrial land uses (see **Table 2.4-1**). **Figures 2.4-1a and 2.4-1b** depict the locations of the other planned projects listed in **Table 2.4-1**. The following planned and approved transportation improvements along local routes may be implemented by local agencies:

- **The I-80/I-680/SR 12 Interchange Project , Initial Construction Package.** Realignment of westbound I-80 from east of the I-80/I-680 Interchange to SR 12 West connector, relocation of the Green Valley Road IC to the east and reconfiguration of the SR 12 West ramps and Green Valley Road on-ramp, occurring from 0.7 mile west on SR 12 West to SR 12 West/I-80 and on westbound I-80 from SR 12 West/I-80 to I-80/I-680.
- **Freeway Performance Initiative – I-80 Ramp Metering.** Installation of ramp metering equipment, traffic operating systems, metal beam guardrail, sign structures, and widen ramp along I-80 in Solano County within the cities of Vallejo, Fairfield, and Vacaville from the Contra Costa County line to I-505.
- **Alamo Creek Bridge Widening Project.** Bridge widening and construction drainage on I-80 in Solano County, in and near Vacaville.
- **Local Roadway Widening.** Local roadway widening at Peabody Road, Leisure Town Road, and Foxboro Parkway.
- **Roadway Extensions.** Roadway extensions at Railroad Avenue and Manuel Campos Parkway.
- **Capitol Corridor Station.** A new rail transit station at the Capitol Corridor Station.

Cumulative traffic forecasts were based on applications of the Solano-Napa Travel Demand Forecasting Model, with some calibration adjustments. The model provides future-year forecasts of traffic volumes for the AM and PM peak hours, based on changes to the land use and changes to the transportation network. Modifications to the model were made to accurately reflect planned and funded land-use development and transportation projects expected to be in place by 2020 and 2040, including the list of planned transportation improvements described above.

ISSUES WITH NO CUMULATIVE EFFECT

If a project would not result in a direct or indirect effect on a resource, then it will not contribute to a cumulative impact on that resource, and does not need to be further evaluated. Land use, parks & recreation, forestry resources, mineral resources, traffic and transportation/pedestrian improvements, and energy conservation were evaluated but found to have no adverse effect. Refer to **Section 2.1, Human Environment** and **Table 2-1** for a more detailed description of these resource areas.

Certain resources are not vulnerable to incremental/cumulative effects. For example, geological/seismic hazards related to future development in areas surrounding the project limits are site specific and relate to the type of building and building foundation proposed, as well as the soil composition and slope on the site. There is no additive effect of the geological/seismic hazards associated with other approved or foreseeable development and the project, and therefore no further cumulative analysis of this resource is warranted. One other resource topic that is site specific, with no additive effect, includes the risks associated with hazardous materials/hazardous wastes exposure. As such, no further cumulative analysis of hazardous materials/hazardous wastes is warranted.

ISSUES WITH THE POTENTIAL TO CONTRIBUTE TO THE CUMULATIVE EFFECT

Community Impacts

The cumulative setting for community impacts includes the 36 block groups immediately surrounding the project limits. Urbanization in the cities of Fairfield and Vacaville influenced development and growth in the area. These areas continue to be diverse communities, representing many races and ethnicities. As discussed in **Section 2.1.5, Community Impacts**, the minority population within the study area represents 54 percent of the community and approximately 6.3 percent of the study area living below the poverty level. These populations are considered environmental justice communities.

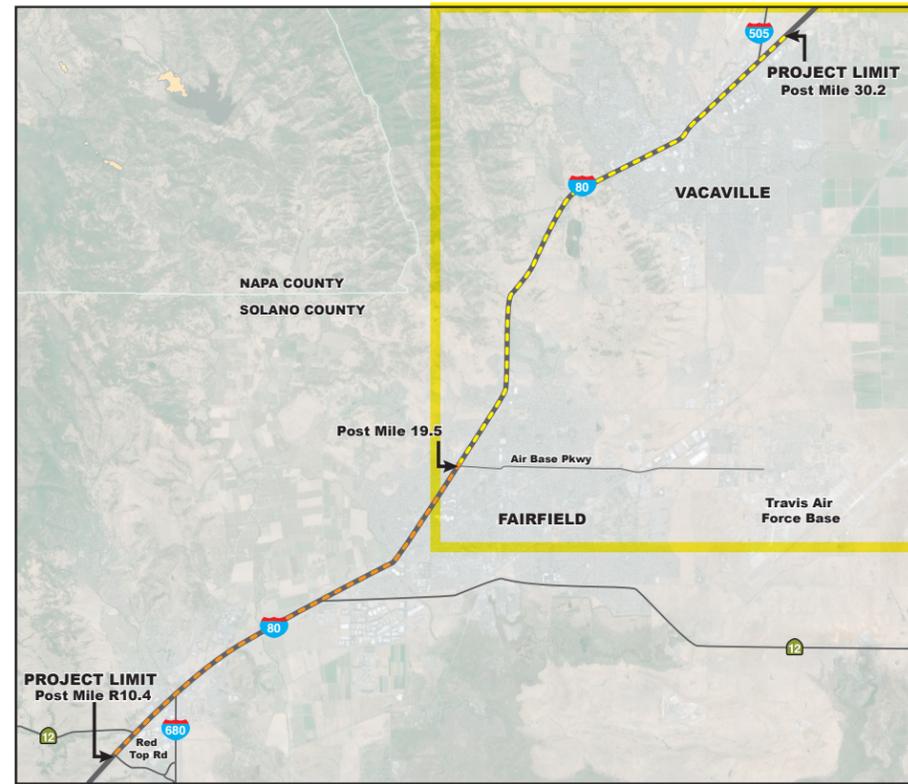
Because approximately half of the communities surrounding the project limits are environmental justice communities, the adverse effects from the approved and foreseeable development combined in these areas could have a disproportionate and cumulative effect on low income or minority populations.

Implementation of the Build Alternative would affect private and public properties listed in **Section 2.1.5, Community Impacts** (see **Table 2.1-12** and **Table 2.1-13**). None of the proposed property acquisitions, construction easements, or utility easements are in areas where there are existing structures or improvements. The remaining portions of these parcels would remain in private ownership. The effects of the Build Alternative would be borne across a wide range of communities including both environmental justice and non-environmental justice communities. No displacement of any residence or business would be required. The Build Alternative would not result in disproportionate impacts to environmental justice communities, and would not cause the displacement of any minority or low-income residences, businesses, or employees. Additionally, existing public facilities that are available to the community are located beyond the project limits and would not be affected by the Build Alternative. As such, the Build Alternative would not contribute to a cumulative effect on environmental justice communities.

Growth

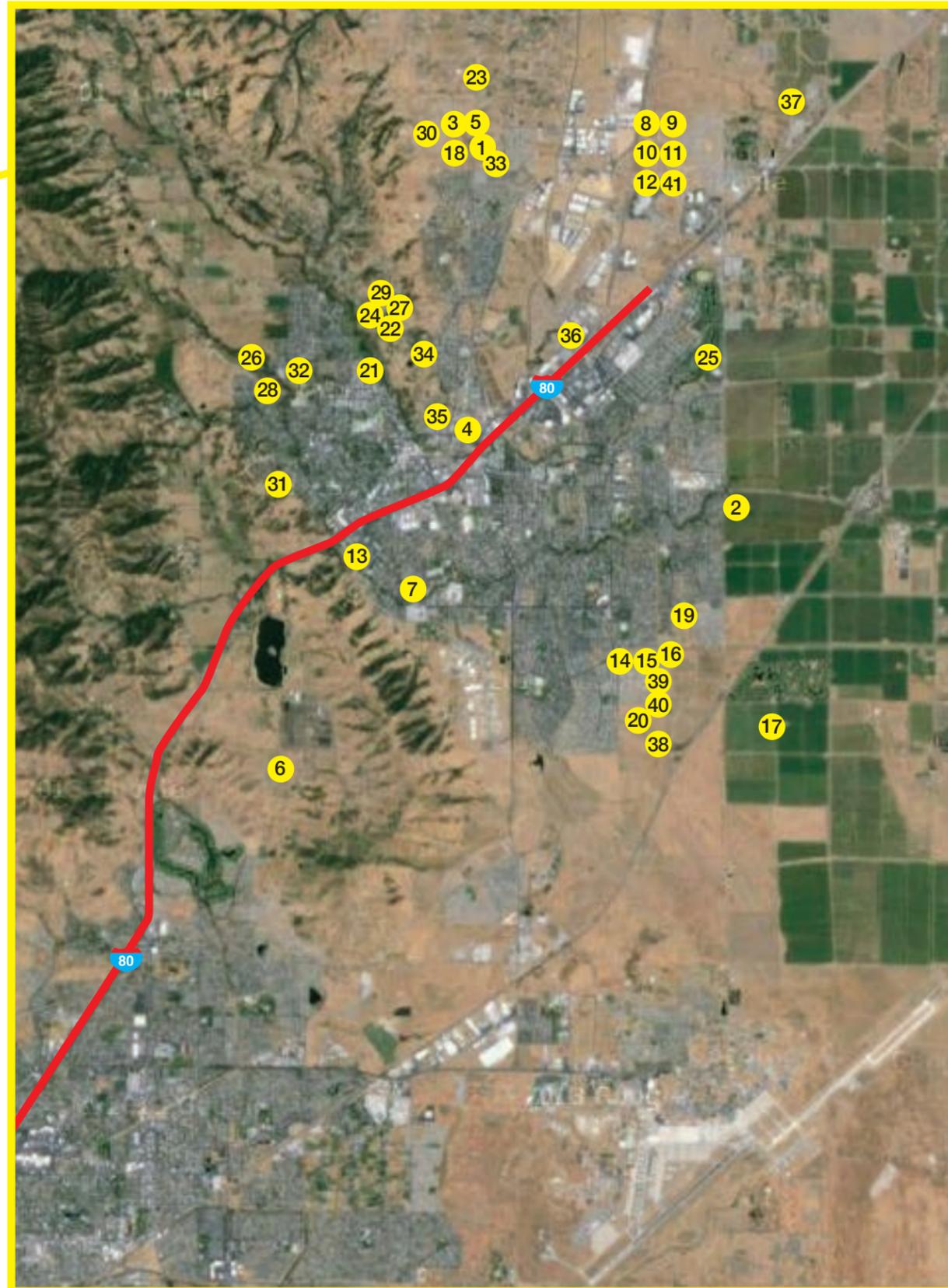
The cumulative setting for the growth is defined by the communities that encompass or are adjacent to the I-80 corridor, within the project limits. As discussed in **Section 2.1.3, Growth**, population, housing, and employment within the study area have been increasing at a stable rate for the last several years. Such growth rates are expected to continue as per many proposed residential, commercial, and industrial developments proposed within the area (**Table 2.4-1**), which is a cumulative growth effect. Furthermore, the Association of Bay Area Governments (ABAG) projects the employment rate within the study area to increase 36 to 38 percent by 2040. Growth for the surrounding communities is planned for under the applicable general plans (Solano County, Fairfield, and Vacaville).

The Build Alternative does not propose any changes to zoning or land use designations within the I-80 corridor. While the Build Alternative would improve access and highway capacity, no new on- or off-ramps to the local roadways would be constructed. Existing access points to the areas surrounding the project limits would remain the same, with the exception of the existing eastbound Travis Boulevard off-ramp being modified into two separate off-ramps to accommodate increased weaving length for the auxiliary lane extension. For these reasons, the Build Alternative would not affect the rate, amount, or type of growth envisioned in the local planning documents and future planned developments in the area. Cumulative effects to growth are not anticipated.



Legend

- █ Project Study Limits
- R - Residential Development



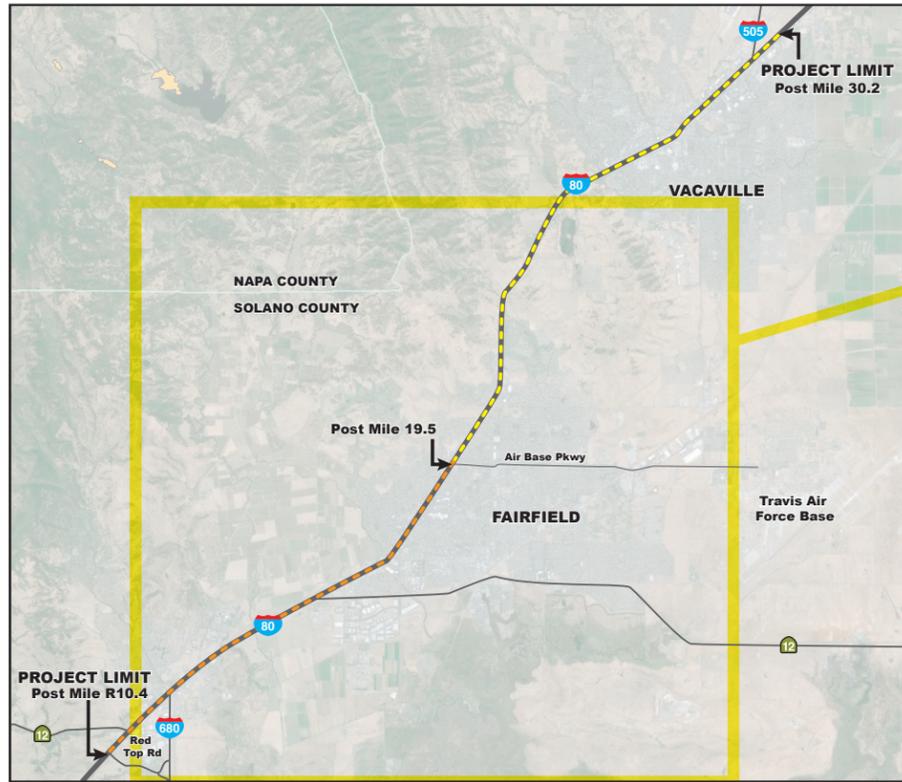
VACAVILLE PROJECTS

- 1 Amber Hills (R)
- 2 Brighton Landing (R)
- 3 Cheyenne (R)
- 4 Ivywood (R)
- 5 Knoll Creek (R)
- 6 Lagoon Valley (R)
- 7 Montessa (R)
- 8 Renaissance at North Village (R)
- 9 Casa Bella at North Village (R)
- 10 Sanctuary at North Village (R)
- 11 North Village Unit 5 (R)
- 12 North Village Unit 6 (R)
- 13 Portofino Unit 2 (R)
- 14 Barrington Estates at Southtown (R)
- 15 Carrington Manor at Southtown (R)
- 16 Southtown Phase 3 (R)
- 17 Southtown Commons (R)
- 18 Rancho Rogelio (R)
- 19 Sterling Chateau 4 (R)
- 20 Vanden Meadows (R)
- 21 Arroyo Vista (R)
- 22 Canyon View (R)
- 23 Cheyenne Estates (R)
- 24 Gibson/Vine Estates (R)
- 25 Golf Course Estates (R)
- 26 Hidden Valley (R)
- 27 Horkey Parcel Map (R)
- 28 Nob Hill Estates (R)
- 29 North Vine Street Estates (R)
- 30 Rogers Ranch (R)
- 31 Spring Lane Unit 2 (R)
- 32 Stratton Estates (R)
- 33 Verona (R)
- 34 Villages on Vine Unit 2 (R)
- 35 Vine Glen Estates (R)
- 36 Nut Tree Apartments (R)
- 37 Quinn Crossing Apartments (R)
- 38 Southtown Apartments (R)
- 39 Southtown Townhouses (R)
- 40 Vanden Meadows Apartments (R)
- 41 Villas at North Village Apartments (R)

Vacaville Planned Developments

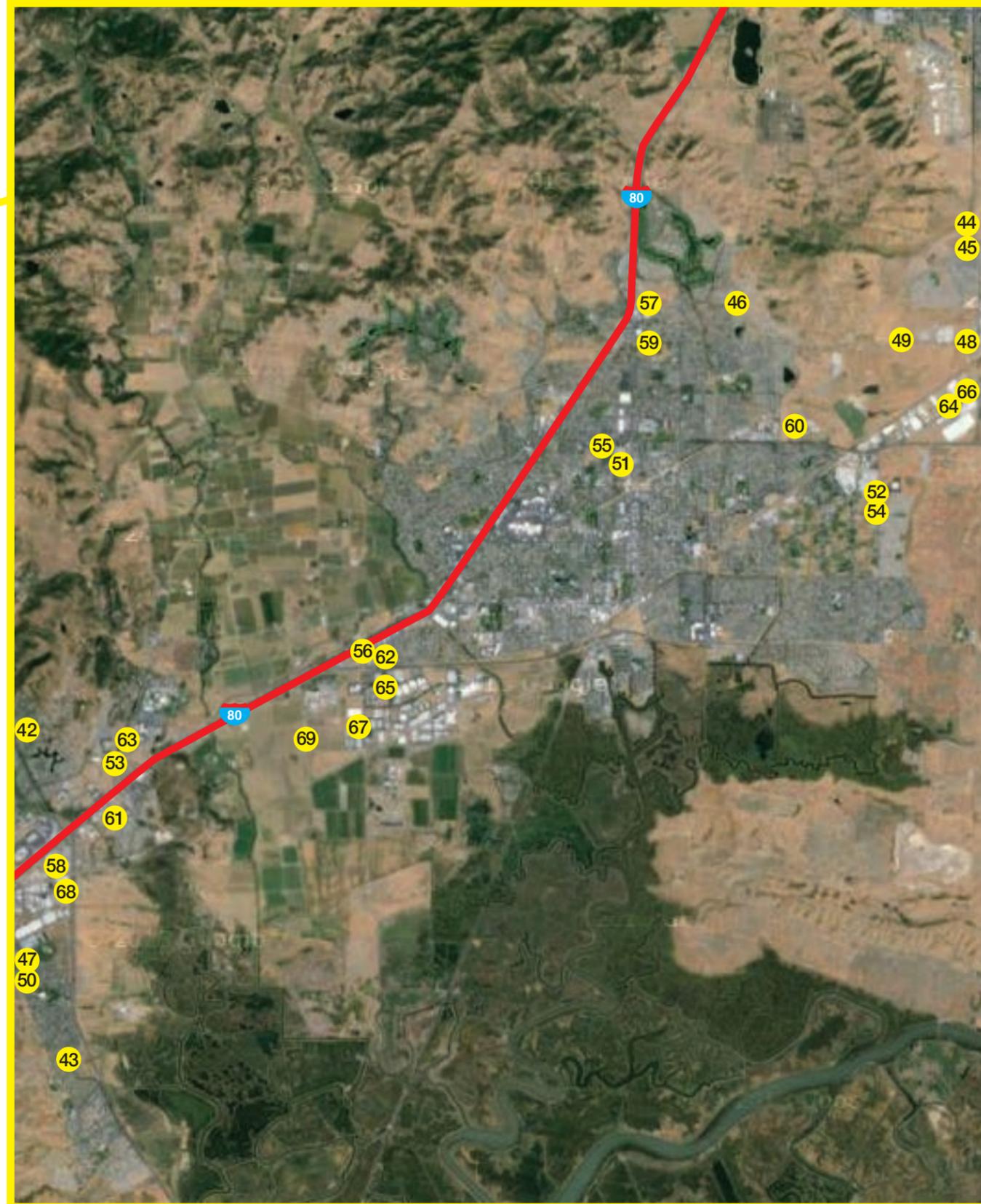
Figure 2.4-1a

(back of Figure 2.4-1a)



Legend

- █ Project Study Limits
- R - Residential Development
- C - Commercial Development
- I - Industrial Development



FAIRFIELD PROJECTS

- 42 East Ridge (R)
- 43 Garibaldi Ranch (R)
- 44 Goldridge (R)
- 45 Madison (R)
- 46 Paradise Crest (R)
- 47 Fieldcrest (R)
- 48 Train Station Specific Plan Area (R)
- 49 Villages at Fairfield (R)
- 50 Villas at Havenhill (R)
- 51 Franklin-Tabor (R)
- 52 Ivy Wreath (R)
- 53 Paesino Verde (R)
- 54 Strawberry Fields (R)
- 55 The Cottages (R)
- 56 Mercedes Benz (C)
- 57 Lowes (C)
- 58 Premium Auto Mall (C)
- 59 Sparkles Express Car Wash (C)
- 60 Laurel Creek Plaza (C)
- 61 Green Valley Ranch (C)
- 62 CarMax (C)
- 63 Green Valley Plaza (C)
- 64 Frank Lin Distillers (I)
- 65 Verizon MSC (I)
- 66 Clorox Tank Farm 1 & 2 (I)
- 67 Lincoln Cordelia Road (I)
- 68 Lopes-Fermi Industrial Flex Building (I)
- 69 JCM Industrial Park (I)

Fairfield Planned Developments

Figure 2.4-1b

(back of Figure 2.4-1b)

Table 2.4-1 Planned Developments

Name	Location	Acres	Units	Proposed Use	Status
Amber Hills	6928,6932,6950,6964 Browns Valley Road Vacaville	19.1	38	Residential	Tentative Map
Brighton Landing	SE of Elmira Road & Leisure Town Road Vacaville	125	769	Residential	Under Review
Cheyenne	Whispering Ridge Drive & W of Browns Valley Road & N of McMurty Lane Vacaville	86	221	Residential	Partially Constructed
Ivywood	201 Beard Street Vacaville	5.9	37	Residential	Partially Constructed
Knoll Creek	W. of Browns Valley Road & Whispering Ridge Drive Vacaville	10	38	Residential	Approved
Lagoon Valley	E. of I-80; S. of Lagoon Valley Road Vacaville	412	1025	Residential	Tentative Map
Montessa	1222 California Drive Vacaville	40	55	Residential	Tentative Map
Renaissance at North Village	Crescent Drive & North Village Parkway Vacaville	19.8	192	Residential	Under Construction
Casa Bella at North Village	Crescent Drive & North Village Parkway Vacaville	2.9	35	Residential	Under Construction

Name	Location	Acres	Units	Proposed Use	Status
Sanctuary at North Village	Crescent Drive & North Village Parkway Vacaville	13.4	162	Residential	Under Construction
North Village Unit 5	Crescent Drive & North Village Parkway Vacaville	11	68	Residential	Under Review
North Village Unit 6	W. of North Village Parkway Vacaville	134.9	176	Residential	Under Review
Portofino Unit 2	S. of Tocia Avenue & Butcher Road Vacaville	1.26	7	Residential	Tentative Map
Barrington Estates at Southtown	E. of Nut Tree; S. of Somerville Drive Vacaville	43.7	165	Residential	Partially Constructed
Carrington Manor at Southtown	E. of Nut Tree; S. of Somerville Drive	41.9	158	Residential	Partially Constructed
Southtown Phase 3	5709 Vanden Road Vacaville	47.9	37	Residential	Tentative Map
Southtown Commons	E. Side Leisure Town Road; & Cypresswood Drive Vacaville	39.4	215	Residential	Tentative Map
Rancho Rogelio	7019 Browns Valley Road Vacaville	20.9	40	Residential	Tentative Map
Sterling Chateau 4	SE Corner Alamo Vanden Road Vacaville	13.7	54	Residential	Tentative Map
Vanden Meadows	E. of Nut Tree Rd.; S. of Opal Way Vacaville	206	939	Residential	Under Review

Name	Location	Acres	Units	Proposed Use	Status
Arroyo Vista	SW Corner of Fruitvale Road & Gibson Canyon Road Vacaville	3.87	8	Residential	Tentative Map
Canyon View	Gibson Canyon Road & Vine Court Vacaville	14.08	15	Residential	Approved Vesting
Cheyenne Estates	NW of Shelton Lane Vacaville	15	15	Residential	Approved Final Map
Gibson/Vine Estates	SE Corner of Gibson Canyon Road/Vine Street Vacaville	9.01	8	Residential	Approved Vesting
Golf Course Estates	White Sands Drive & Whitney Court Vacaville	16.8	3	Residential	Recorded Final Map
Hidden Valley	N. Alamo Drive & Hidden Valley Lane Vacaville	25.5	31	Residential	Recorded Final Map
Horkey Parcel Map	385 Vine Street Vacaville	3.5	2	Residential	Tentative Map
Nob Hill Estates	End of Seneca Way Vacaville	12.17	9	Residential	Approved Final Map
North Vine Street Estates	N. end of Vine St.; E. of Gibson Canyon Road Vacaville	60.4	58	Residential	Approved Final Map
Rogers Ranch	N. of McMurtry Lane & Grace Feather Court Vacaville	35	28	Residential	Vesting Tentative Map
Spring Lane Unit 2	Spring Lane & Monte Verde Drive Vacaville	52.85	27	Residential	Tentative Map

Name	Location	Acres	Units	Proposed Use	Status
Stratton Estates	607 Shady Glen Road Vacaville	4	10	Residential	Partially Constructed
Verona	190 Rice Lane Vacaville	4.72	4	Residential	Tentative Map
Villages on Vine Unit 2	E. of Vine Street & Gibson Canyon Road Vacaville	12.9	25	Residential	Under Construction
Vine Glen Estates	Bresee Ave/Vine Street Vacaville	6.3	19	Residential	Tentative Map
Nut Tree Apartments	Nut Tree Road & E Monte Vista Ave Vacaville	12	216	Residential	Approved
Quinn Crossing Apartments	9999 Quinn Road Vacaville	17.3	312	Residential	Pending Submittal
Southtown Apartments	W. of Leisure Town Road & Vanden Road Vacaville	10.7	223	Residential	Tentative Map
Southtown Townhouses	W. Side Vanden Road & Cogburn Circle Vacaville	6.3	60	Residential	Tentative Map
Vanden Meadows Apartments	W. of Vanden Road; N. of Newcastle Drive Vacaville	8.17	60	Residential	Approved Planned Development
Villas at North Village Apartments	North Village Parkway & Crescent Drive Vacaville	9.9	228	Residential	Approved
Eastridge	Green Valley Road & Eastridge Drive Fairfield	N/A	217	Residential	Active

Name	Location	Acres	Units	Proposed Use	Status
Garibaldi Ranch	Lopes Road & Gold Hill Road Fairfield	N/A	520	Residential	Active
Gold Ridge	Peabody Road & Chuck Hammond Drive Fairfield	N/A	1458	Residential	Active
Madison	Peabody Road & Gramercy Circle Fairfield	N/A	221	Residential	Active
Paradise Crest	Manuel Campos Parkway & Mystic Drive Fairfield	N/A	150	Residential	Active
Fieldcrest	Red Top Road & Oakbrook Drive Fairfield	N/A	384	Residential	Future
Train Station Specific Plan Area	Peabody Road & Cement Hill Road Fairfield	N/A	N/A	Residential	Future
Villages at Fairfield	Cement Hill Road & Walters Road Fairfield	N/A	1717-2159	Residential	Future
Villas at Havenhill	Red Top Road & Oakbrook Drive Fairfield	N/A	324	Residential	Future
Franklin-Tabor	Tabor Avenue & Pacific Avenue Fairfield	N/A	23	Residential	Inactive
Ivy Wreath	East Tabor Avenue & Walters Road Fairfield	N/A	73	Residential	Inactive

Name	Location	Acres	Units	Proposed Use	Status
Paesino Verde	Business Center Drive & Suisun Valley Road Fairfield	N/A	284	Residential	Inactive
Strawberry Fields	East Tabor Avenue & Walters Road Fairfield	N/A	39	Residential	Inactive
The Cottages	Union Avenue & Peach Tree Drive Fairfield	N/A	45	Residential	Inactive
Mercedes Benz	2950 Auto Mall Fairfield	77,914 square feet		Commercial	Under Construction
Lowe's	N. Texas at Manuel Campos Fairfield	139,000 square feet		Commercial	Under Construction
Premium Auto Mall	Auto Plaza Court Fairfield	10,000 +/- square feet		Commercial	Under Construction
Sparkles Express Car Wash	3103 N. Texas Fairfield	3,000 square feet		Commercial	Approved
Laurel Creek Plaza	Air Base at Claybank Fairfield	110,186 square feet		Commercial	Approved
Green Valley Ranch	4455 Central Fairfield	N/A		Commercial	Future Phase
CarMax	2901/2955 Auto Mall Parkway Fairfield	64,000 square feet		Commercial	Approved. Awaiting Building Permit
Green Valley Plaza	200 Suisun Valley Road Fairfield	455,000 square feet		Commercial	Application Under Review
Frank Lin Distillers	2455 Huntington Drive Fairfield	N/A		Industrial	Completed

Name	Location	Acres	Units	Proposed Use	Status
Verizon MSC	2555 N. Watney Way Fairfield	49,235 square feet		Industrial	Under Construction
Clorox Tank Farm 1 & 2	2600 Huntington Drive Fairfield	N/A		Industrial	Under Construction
Lincoln Cordelia Road	2901 Cordelia Road Fairfield	119,000 square feet		Industrial	Time Extension Field
Lopes-Fermi Industrial Flex Building	555 Lopes Road Fairfield	32,509 square feet		Industrial	Time Extension Field
JCM Industrial Park	Cordelia Road at Hale Ranch Road Fairfield	841,000 square feet		Industrial	On Hold

Source: Caltrans, 2014d

Farmlands

The cumulative setting for agricultural resources includes proposed developments within Solano County that could convert open space/farmlands to urban land uses. There has been a trend of conversion of farmland to developed land in northern California that has resulted in a loss of substantial farmland. The Prime Farmland closest to the project limits is generally located west of Fairfield, in Suisun Valley. Construction of the project in combination with other planned development previously listed would contribute to the continued loss of agricultural land in the region. This is considered a cumulative effect. **Figure 2.4-1a and 2.4-1b** depict the locations of planned projects within Fairfield and Vacaville. Most of the projects would be constructed in developed and urban areas and do not affect farmland resources. However, several of the projects are located near Prime Farmland areas including, the Quinn Crossing Apartments (ID #37), Brighton Landing Residences (ID #2), Stratton Estates (ID # 32), and the JCM Industrial Park (ID #69). If these projects were to encroach onto Prime Farmland, they would also contribute to the cumulative impact to farmland resources.

As discussed in **Section 2.1.4, Farmlands/Timberlands**, the Build Alternative would convert 0.01 acres of prime farmland and Williamson Act property for a utility easement. This easement is located immediately adjacent to the I-80 corridor, where cultivation of agricultural products is limited to non-existent because of physical constraints associated with freeways (i.e., proximity to high traffic volumes). For this reason, and the relatively small acquisition anticipated, the farmland acquisition anticipated under the Build Alternative would not be a considerable contribution to the permanent loss of agricultural land in the region.

Utilities/Emergency Services

The cumulative setting for utilities and emergency services includes the service areas of the particular utility and public service providers that encompass the project limits. Water and wastewater services are provided by a combination of local special districts and private companies whose service areas extend well beyond the immediate boundaries of the project limits. Fairfield Fire Department, Fairfield Police Department, Vacaville Fire Department, and Vacaville Police Department Police provide protection and traffic enforcement services within the project limits. The California Highway Patrol (CHP) has jurisdiction over the I-80 corridor for matters involving traffic violations.

As discussed in **Section 2.1.3, Growth**, the study area has experienced stable development over the past several years. Such growth rates are expected to continue as per many proposed residential, commercial, and industrial developments proposed within the area (**Table 2.4-1**), and would continue to require public services from regional utility providers and emergency service providers. Accordingly, continued growth would require increased services, which is a cumulative effect.

As individual land use development projects are proposed, specific project-related effects associated with the provision of utilities and public services will be evaluated. The evaluation would assess the potential effects within the context of maintaining existing levels of service, budgetary constraints, and the long-term plans of service providers to adjust to anticipated population and employment growth within the region.

Future transportation projects, including the Build Alternative, are not anticipated to directly increase population in the surrounding communities, and would not contribute to a permanent increase in demand for these services. Given that utility demand and public services is accounted for in planning and resource documents that predict future demand and supply such services, and that the transportation projects would not directly increase population in the area, no cumulative effect to utilities and emergency services would occur.

Visual/Aesthetics

The area of cumulative setting for effects related to visual resources encompasses the viewshed or visible environment surrounding the project limits. The majority of future development surrounding the project limits (listed in **Table 2.4-1**) will involve redevelopment of existing areas or infill development of vacant lots within urbanized areas. Therefore, the cumulative trend will continue to predominantly be redevelopment of existing low-intensity and underutilized parcels with new urban uses. The cities along the project limits have policies in place to direct growth and development towards existing urbanized areas. In addition, the City of Fairfield has entered into a greenbelt agreement with Vacaville, to preserve approximately 4,100 acres between Vacaville and Fairfield as agricultural lands. No urban development is proposed in rural areas and would occur within the cities' urban growth boundaries. New development proposed under the Vacaville General Plan could contribute to light pollution in the region as well. However, future development in all jurisdictions are subject to the California Building Code standards that would prevent potential impacts associated with light and glare.

None of the transportation improvement projects, including the Build Alternative, would substantially affect scenic vistas or resources. Proposed projects planned within Fairfield would comply with policies OS 1.4-OS 6 in the General Plan to reduce potential development-related effects on scenic vistas. Proposed project planned within Vacaville would comply with policies LU.P.2 and LU 2.1 in the General Plan to prevent development in open space areas and reduce visual effects. Effective implementation of such policies would ensure that the future land use projects listed in **Tables 2.4-1** would not adversely affect scenic vistas or resources. The planned land use developments and future projects, including the Build Alternative, would not result in cumulative effects to the visual character and quality of the I-80 corridor.

Cultural Resources and Paleontology

The cumulative setting for cultural and paleontological resources includes the areas within and surrounding the project limits which have documented cultural and paleontological resource sites, and/or high sensitivities to unrecorded artifacts (Caltrans, 2014n). Cumulative effects to cultural and paleontological resources would occur if planned and foreseeable development results in the

removal of a substantial number of historic structures or archaeological/paleontological sites that, when taken in combination with the project, and could degrade the physical historical record of the larger project region. Since all planned and foreseeable projects, including the Build Alternative, would involve ground disturbing construction activities, all projects have the potential to adversely affect known and unknown resources. However, cultural and paleontological resources - both known and unknown - are protected by a number of federal, state, and local regulations, reinforced by goals, and policies associated with each city's general plan as well as the planning documents of the transportation agencies that would be approving the planned and foreseeable improvements.

If human remains are discovered, State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the County Coroner contacted. Pursuant to Public Resources Code Section 5097.98, if the remains are thought to be Native American, the coroner will notify the Native American Heritage Commission (NAHC) who will then notify the most likely descendant (MLD). At this time, the person who discovered the remains will contact Caltrans Professionally Qualified Staff (PQS) Archaeologist so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find. Additional study or survey will be needed if the project design changes or project limits are extended beyond the present survey limits.

Provisions to address unintentional adverse effects on archaeological resources within the project limits are included in the Avoidance, Minimization, and/or Mitigation Measures in **Section 2.1.9, Cultural Resources**. Environmentally Sensitive Areas (ESAs) and Testing/Treatment plans were established to protect known cultural resources within the area of potential effect (APE). The protective measures outlined in these plans include establishing (i.e., through protective exclusion fencing) and monitoring ESAs around the known archaeological site boundaries during construction, testing excavations and subsurface resource identification, and formal documentation of the results of the testing and data recovery. These ESAs and Testing/Treatment plans will be filed with the California State Historic Preservation Officer (SHPO) for concurrence with the protective measures. Issuance of a Finding of No Adverse Effect is dependent on the results of the planned subsurface testing during project construction. Pending their review and approval of completed construction phase testing, SHPO will issue a letter of concurrence for the Finding of No Adverse Effect if no resources are discovered. If resources are discovered during the construction phase subsurface testing, additional protective and/or avoidance plans would be prepared and submitted to SHPO for concurrence. The Build Alternative is not expected to cause an adverse effect to known archaeological sites with the implementation of the ESA and Testing/Treatment plans.

All of the future transportation improvements would also be required to adhere to Caltrans standard approach to project-related paleontological resource efforts, which involves the identification, evaluation, and, as necessary, mitigation. These three steps generally entail preparation of five separate documents that are:

- Paleontological Identification Report (PIR)
- Paleontological Evaluation Report (PER)
- Paleontological Mitigation Plan (PMP)
- Paleontological Mitigation Report (PMR)
- Paleontological Stewardship Summary (PSS)

Implementation of the regulations and standard Caltrans resource identification efforts, as prescribed under the Build Alternative, would ensure no cumulative effect to cultural or paleontological resources. As such, the planned development in combination with the Build Alternative would not result in a cumulative effect to cultural or paleontological resources.

Hydrology and Floodplain/Water Quality and Storm Water Runoff

The cumulative setting for hydrology, floodplains, water quality, and storm water runoff includes water resources and floodplains within the project limits. Historically, agriculture has impacted runoff patterns in the areas adjacent to the I-80 corridor in the West Segment of the project limits. Along the East Segment, runoff patterns are affected by the urban development. Anticipated development in the region (i.e., projects listed in **Table 2.4-1** and planned transportation projects), including the Build Alternative, would contribute to an increase in impervious surface in the watershed area that could increase the quantity and velocity of storm water runoff and reduce groundwater recharge. For those developments that appear to be located on higher elevations/hillside (ID Nos. 6, 13, 31, 44, 46, and 57), based on US topographic maps, groundwater recharge is not an issue given the depth to groundwater can range up to 20 feet deep. Certain land use development projects planned for in low-density urban areas may potentially convert natural ground cover to impervious structures and/or paved surfaces. Any additional impervious areas would decrease the amount of rainfall expected to infiltrate into the ground and would result in higher peak flows in area drainages. Increased peak flows could exacerbate flooding problems along the drainage lines that experience flooding under existing conditions.

All future and planned projects in the region would be required to comply with the requirements of the State Water Resource Control Board (SWRCB) C.3 regulations and coordinate with City and County construction and flooding regulations. The SWRCB regulations require the incorporation of post-construction storm water controls, which include measures to reduce storm water pollutants, or otherwise minimize the change in rate and flow of storm water runoff. Each project would convey its storm water runoff via different drainage systems, which would be required to have adequate capacity for any increased runoff. The Build Alternative would not violate any water quality standards, deplete groundwater supplies, alter drainage patterns, or create capacity exceeding runoff through the implementation of standard long-term pollution prevention and control measures be incorporated into the final design (see **Measures WQ-1** through **WQ-3**). Based on a review of the foreseeable projects, with implementation of state and local regulations,

such projects would not result in an adverse effect to hydrology and water quality. Thus, anticipated development in combination with the Build Alternative would not result in a cumulative effect to hydrology, floodplains, and water quality.

Air Quality

The cumulative setting for air quality includes the Sacramento Valley Air Basin and the San Francisco Air Basin. Past and present development within both air basins has contributed to increased levels of traffic congestion and degrading air quality conditions. The operation of the planned land use development projects listed in **Table 2.4-1** would generate additional traffic emissions. In addition, improved freeway operations would result in an increase in vehicle miles traveled (VMT) and related increases in vehicle emissions. Therefore, air quality impacts associated with transportation and other development projects in the Sacramento and San Francisco Air Basins would result in cumulative effects to air quality for permanent operational pollutant emissions. The projects listed in **Table 2.4-1** are required to comply with the Bay Area 2010 Clean Air Plan. The Bay Area 2010 Clean Air Plan (CAP) takes into account future growth projections to 2035 and serves to:

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the California Clean Air Act to implement “all feasible measures” to reduce ozone
- Provide a control strategy to reduce ozone, particulate matter, air toxics, and greenhouse gases in a single, integrated plan
- Review progress in improving air quality in recent years
- Establish emission control measures to be adopted or implemented in the 2010-2012 timeframe.

The Cities of Vacaville and Fairfield must ensure that the projects are in compliance with the CAP and that the project implements control measures to improve air quality and protect public health.

Transportation plans that conform with the State Implementation Plan (SIP) are not considered to cause or contribute to violations of ambient air quality standards. Furthermore, a project included in a conforming plan would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard. Conforming transportation plans are subject to a threshold of no net increase in emissions. The proposed project is included in Plan Bay Area, the Regional Transportation Plan (RTP), and the Regional Transportation Improvement Program (RTIP), which conform to the SIP. Therefore, the Build Alternative would not result in a cumulatively considerable net increase of any criteria pollutant.

Noise

The cumulative setting for noise is equivalent to the noise study area evaluated in **Section 2.2.7, Noise**, and encompasses all developed land uses surrounding the proposed Build Alternative improvements, with a focus on noise-sensitive receivers. Noise-sensitive land uses in the vicinity of the project limits include single- and multi-family residences, active recreational areas, day care centers, churches and hotels. The noise study that was prepared for the project utilized projected (2040) traffic noise conditions from the Solano-Napa Travel Demand Forecasting Model, which represent cumulative conditions within the study area.

Planned developments considered in the cumulative noise analysis include those residential projects that have received final development approval are within approximately 500 feet of the centerline of I-80, where traffic noise levels from the highway could dominate the noise environment. Future developments located beyond this distance are excluded from further analysis. Most of the proposed developments near the study area are located within developed areas, as shown in **Figures 2.4-1 and 2.4-2**.

The majority of adjacent land uses approach or exceed noise abatement criteria (NAC) levels.¹ With more planned regional development, noise levels are anticipated to be almost equal to existing conditions in most locations, with a slight increase of 1 A-weighted decibel (dBA) for some areas. However, these changes are not considered a substantial increase in noise (defined as 12 dBA or more increase). With the exception of Segment 6 (located between Allison Drive to Leisure Town Road), all of the noise study area segments would experience noise levels that approach or exceed the NAC under the 2040 Build Alternative conditions, requiring noise abatement consideration. A total of 21 potential noise barriers were evaluated for feasibility, and reasonable allowance (see **Appendix G**). Ten of the twenty-one barriers were found to be both acoustically feasible and achieve the Caltrans noise reduction design goal (minimum 7 dBA reduction for at least one receptor). Two of the ten barriers were deemed feasible and reasonable, as identified in **Mitigation Measure NOI-A** and in **Table 2.2-37**. Barrier SW11 would be located on the north side of Davis Street/Hickory Lane on-ramp to westbound I-80. Barrier SW12a would be located along the eastbound I-80 edge of shoulder, in front of the Sunset Circle Mobile Homes Complex.

The implementation of the noise abatement options determined to be feasible and reasonable would effectively reduce noise levels below the NAC thresholds to a level that would completely offset the Build Alternative's contribution to cumulative noise levels. The chosen abatement type would be the construction of noise barriers. If conditions substantially change during final design, noise barriers might not be provided. The views and opinions of the residents living immediately adjacent to the I-80 corridor and affected by the traffic noise would be considered in reaching a decision on noise abatement measures. Caltrans' policy is to not provide noise barriers if 50 percent or more of those affected residents do not want them. The opinions of these residents would be obtained through public and community meetings or other means, as appropriate. The final decision regarding noise abatement would be made upon completion of the project design and public involvement processes.

¹ NAC are used to determine when a noise impact would occur, depending on the type of land use under analysis.

Biology

The area of cumulative analysis for biological resources includes the Biological Study Area (BSA) identified for the Build Alternative plus any immediately adjacent lands and waterways containing sensitive biological resources (sensitive habitats or protected plant or animal species).

Development within the area from nearby past, current, and reasonably foreseeable future projects have affected biological resources in the region. Continued development trends would increase such disturbance to the California red-legged frog (*Rana draytonii*), American Badger (*Taxidea taxus*), western pond turtle (*Actinemys marmorata*), burrowing owl (*Athene cunicularia*), valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), and others discussed in **Section 2.3, Biological Environment**.

Future transportation improvements and land use developments have an unknown and unquantifiable effect on special-status species and potential biologically sensitive habitats. Although not quantifiable, it is assumed that the implementation of the planned and foreseeable improvements may result in the degradation of wildlife habitat through a variety of actions which, when combined with the Build Alternative, may result in a cumulative impact to biological resources as described below.

According to the Vacaville General Plan EIR, development allowed under the General Plan could contribute to the cumulative loss of habitat for a number of plant and animal species and sensitive habitats, including riparian habitats and wetlands. Similar effects could potentially occur in Fairfield. The Cities of Vacaville and Fairfield are participants in the Solano Habitat Conservation Plan (HCP). The Solano HCP anticipates that within the next 30 years, 16,000 acres of agricultural lands, grasslands, oak savannas, woodlands, vacant lots, and riparian habitats within the County could be converted to urban uses. Accordingly, the Vacaville and Fairfield have policies in place to reduce cumulative impacts to such land. However, proposed development within the General Plan area could result in significant effects to the Vacaville-Fairfield Greenbelt corridor, a key wildlife corridor for species. This wildlife corridor land is owned by Solano Irrigation District (SID). Because SID would not be able to use this land for purposes that would be compatible with a wildlife corridor, cumulative impacts to habitat for a number of plant and animal species is anticipated. However, the effects of the planned and programmed projects would be assessed as part of their separate agency consultation and permitting processes. Compliance with the regulations and adherence to the required permitting processes would ensure that there are no unmitigated effects resulting from the planned projects in the region.

The physical footprint of the proposed Build Alternative improvements may result in direct impacts to suitable habitat for a variety of sensitive natural communities, wetlands and other waters, and special-status species. The proposed project activities would include impacts outside the Caltrans right-of-way that would permanently convert mixed oak woodlands and riparian woodland. Permanent impacts to wetlands would include direct placement of fill within wetlands and loss of wetland vegetation due to shading effects. Any permanent loss of wetlands or habitat would be mitigated through creation of wetlands at an approved mitigation bank or conservation lands. The Build Alternative would not impact the Vacaville-Fairfield Greenbelt corridor because proposed work is limited to the I-80 corridor and its immediate right-of-way.

Water quality during project operation would be protected by best management practices (BMPs) that would be developed and approved prior to construction (see **Section 2.2.2, Water Quality; Measures WQ-1, WQ-2, and WQ-3** for further details regarding temporary and permanent BMPs). Implementation of the BMPs would ensure that the natural beneficial values of the waterways within the BSA were maintained for the special-status species that could be present in this aquatic habitat. In addition to the measures that would protect the water quality of aquatic habitats, the Build Alternative includes a number of avoidance and minimization measures that are considered part of the project design and apply to all of the proposed improvements under the Build Alternative (see **Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**). In summary, these measures include provisions that would require:

- assignment of qualified biological monitor during construction
- implementation of worker environmental awareness training
- implementation of seasonal restrictions and work windows for certain construction activities
- installation of temporary fences and barriers around ESAs
- implementation of standard Caltrans BMP during construction
- conducting of pre-construction surveys
- coordination with agencies as needed
- proper use of vehicle use near sensitive natural communities
- restoration of damaged buffer areas after construction

These avoidance measures would be implemented prior to and during construction activities, and would be included as part of the special provisions of the construction bid package for the project. Implementation of the avoidance and minimization measures included in the project design would avoid adverse effects to the majority of the wildlife species within the BSA. Adverse effects that would not be avoided and/or reduced through the implementation of the avoidance measures include the direct displacement of oak woodlands; jurisdictional water features; and habitats suitable for burrowing owl and California red-legged frog. Therefore, compensatory mitigation measures have been proposed. See **Impacts BIO-A through BIO-F in Section 2.3.7, Avoidance and Minimization Measures and Project Mitigation Measures**. Implementation of **Mitigation Measures BIO-A through BIO-F**, in combination with the avoidance measures, would offset adverse impacts to the direct displacement of oak woodlands, jurisdictional water features, and special-status species. Thus, the Build Alternative would not have a considerable contribution to cumulative biological effects.

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2.5 CLIMATE CHANGE

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF₆), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO₂, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).¹

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing travel activity, 3) transitioning to lower GHG-emitting fuels, and 4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued cooperatively.²

2.5.1 REGULATORY SETTING

STATE

With the passage of several pieces of legislation including State Senate and Assembly bills and Executive Orders, California launched an innovative and proactive approach to dealing with GHG emissions and climate change.

¹ http://climatechange.transportation.org/ghg_mitigation/

² http://www.fhwa.dot.gov/environment/climate_change/mitigation/

Assembly Bill 1493 (AB 1493), Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) 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.

Executive Order (EO) S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to 1) year 2000 levels by 2010, 2) year 1990 levels by 2020, and 3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32 (AB 32), Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (ARB) to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (SB 391) Chapter 585, 2009 California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

FEDERAL

Although climate change and GHG reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level GHG analysis.³ FHWA supports the approach that climate change

³ To date, no national standards have been established regarding mobile source GHGs, nor has U.S. EPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.

considerations should be integrated throughout the transportation decision-making process—from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the “National Clean Car Program” and EO 13514 - *Federal Leadership in Environmental, Energy and Economic Performance*.

Executive Order 13514 (October 5, 2009): This order is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

U.S. EPA’s authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court’s ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court’s interpretation of the existing Act and EPA’s assessment of the scientific evidence that form the basis for EPA’s regulatory actions. U.S. EPA in conjunction with NHTSA issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.⁴

The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

⁴ <http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq>

The final combined standards that made 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 implemented by this program are expected to reduce GHG 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).

On August 28, 2012, U.S. EPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary U.S. EPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi-trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO₂ emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

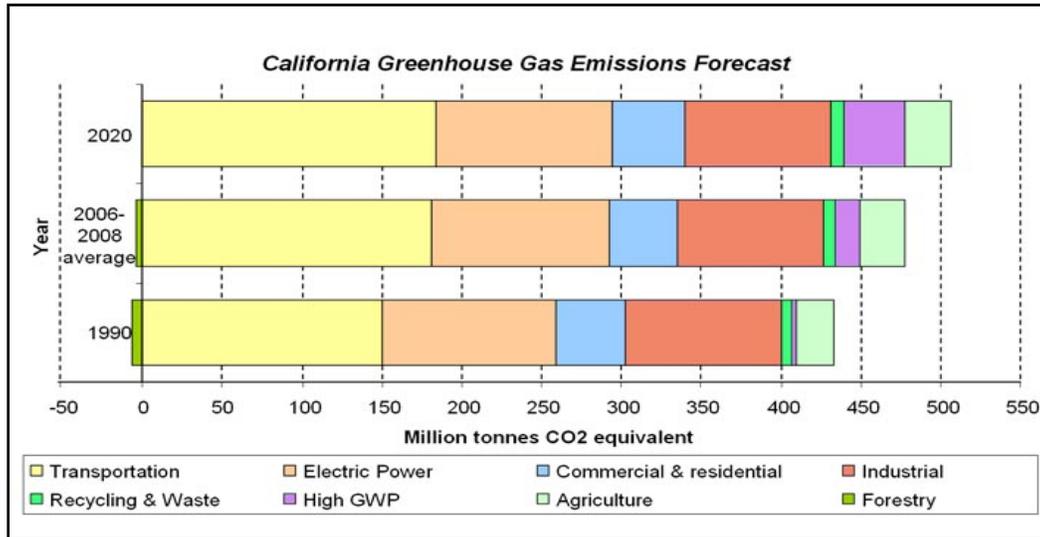
2.5.2 PROJECT ANALYSIS

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 contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.⁵ In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

⁵ This approach is supported by the AEP: Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the U.S. Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

Figure 2.5-1 California Greenhouse Gas Forecast



Source: <http://www.arb.ca.gov/cc/inventory/data/forecast.htm>

The Department and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, the Department has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.⁶

Projections of future conditions for travel within the project limits are anticipated to increase substantially by the year 2040, largely as a result of local and regional residential and employment growth projected over that period. As indicated in the **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, the new express lanes would accommodate approximately 35 percent more vehicles, providing better distribution of vehicles over all the lanes, which would relieve congestion and queuing along the entirety of the I-80 study corridor. No bottlenecks are expected with implementation of the Build Alternative in opening year 2020.

As indicated in the **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, under the No-Build Alternative, several segments of the I-80 corridor are expected to deteriorate to unacceptable LOS E conditions relative to existing conditions, with speeds as low as 47 miles per hour (mph) in some locations. These segments would experience increased congestion in the general purpose lanes, particularly between Beck Avenue and Travis Boulevard, and from Manuel Campos Parkway to Peabody Road during the PM peak period eastbound. Traffic would also worsen between West Texas Street and Suisun Valley Road during the AM peak period westbound.

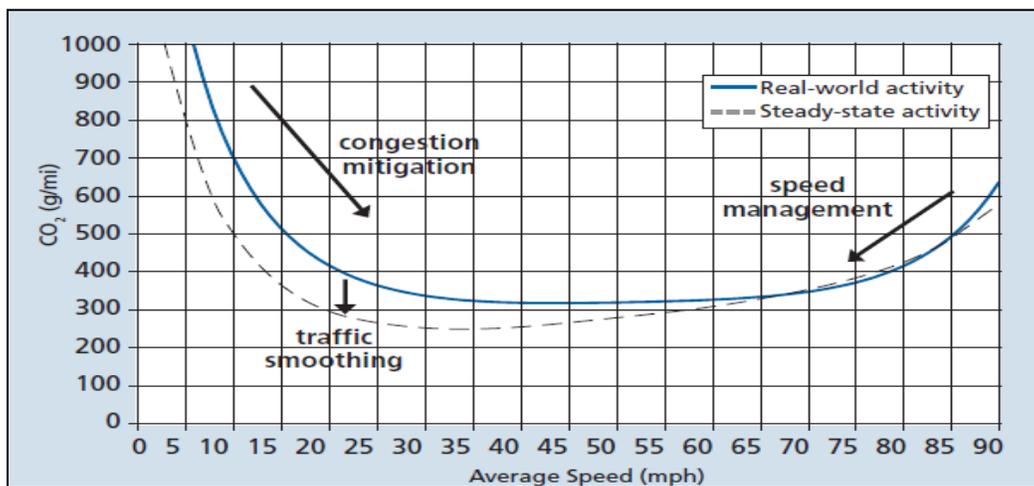
⁶ Caltrans Climate Action Program is located at the following web address:
http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

Average travel times along the I-80 study corridor are anticipated to increase by over 0.5 minutes by 2040, as indicated in **Table 2.1-26 of Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities.**

One of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide (CO₂), from mobile sources, such as automobiles occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0-25 miles per hour (see **Figure 2.5-2**). 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.

The Build Alternative intends to relieve existing traffic congestion and improve traffic flow on the local roadway network for approved redevelopment and planned growth in the area. As discussed in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, under 2040 conditions, the Build Alternative would distribute projected increases in traffic volumes within the project limits, reduce bottleneck conditions, and provide additional capacity for use by high occupancy vehicles and toll-paying single occupant vehicles. The effects of the Build Alternative would result in an increased throughput and more efficient operations of the I-80 corridor.

Figure 2.5-2 Possible Effect of Traffic Operation Strategies in Reducing On-Road CO₂ Emission



Source: *Traffic Congestion and Greenhouse Gases: Matthew Barth and Kanok Boriboonsomsin (TR News 268 May-June 2010)* <<http://onlinepubs.trb.org/onlinepubs/trnews/trnews268.pdf>>

Under 2020 Build Alternative conditions, I-80 traffic congestion would be less than the traffic congestion anticipated under the No-Build Alternative. The conversion of the HOV lane to an express lane from Red Top Road to Air Base Parkway would result in a 6 percent increase in vehicles using the express lane, which would decrease congestion in the general purpose lanes. As indicated in **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**,

overall, implementation of the Build Alternative would accommodate approximately 35 percent more vehicles, providing better distribution of vehicles over all the lanes, which would relieve congestion and queuing within the entirety of the I-80 project limits.

Under 2020 Build Alternative conditions, overall travel times within the project limits would be less than travel times anticipated under the No-Build Alternative. Overall, travel times would be reduced by up to 30 seconds relative to the 2020 No-Build Alternative, as shown in **Table 2.1-23 of Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**. During the AM peak period, express lane travel times would decrease by 1.9 minutes in the westbound direction and 1.8 minutes in the eastbound direction. During the PM peak period, express lanes travel times would decrease by 1.6 minutes in the westbound and 1.7 minutes in the eastbound direction. Overall, travel times would be reduced by up to 27 seconds relative to the 2040 No-Build Alternative, as shown in **Table 2.1-26 of Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**. Relative to general purpose lanes, express lane travel times would be reduced by up to 1.5 minutes in the eastbound and westbound directions in the AM peak hour. During the PM peak hour, there would be a travel time savings of up to 1.3 minutes in the westbound direction and up to 1.9 minutes in the eastbound direction, relative to the general purpose lanes.

The current regional transportation plan (RTP) for the San Francisco Bay Area, known as Plan Bay Area, was adopted by Metropolitan Transportation Commission (MTC) on July 18, 2013 and was approved by Caltrans on August 12, 2013. Plan Bay Area grew out of “The California Sustainable Communities and Climate Protection Act of 2008” (SB 375), which requires each of the state’s 18 metropolitan areas, including the San Francisco Bay Area, to reduce greenhouse gas emissions from cars and light trucks. Key elements of SB 375 include the requirement that the San Francisco Bay Area and other California regions develop a SCS, a new element of the RTP, to strive to reach the GHG reduction target established for each region by the California Air Resources Board. The San Francisco Bay Area’s target is a 7 percent per capita reduction in GHG by 2020 and a 15 percent per capita reduction by 2035. Plan Bay Area is the region’s first RTP pursuant to SB 375. In the Plan Bay Area, the land use and housing assumptions for the SCS include demonstration of how the development pattern and the transportation network can work together to reduce GHG emissions. MTC’s Plan Bay Area is expected to achieve a 9 percent overall reduction in VMT between 2005 and 2040, which is short of their 10 percent VMT reduction target. This near-achievement of the per-capita VMT target reflects the carefully targeted locations of envisioned housing and commercial development in Priority Development Areas with excellent transit service.

The proposed project (RTP ID 240581 and 230660) is included in the regional emissions analysis conducted by MTC for the Plan Bay Area. Additionally, the project is included in the MTC’s 2013 Transportation Improvement Program (TIP) as project number SOL110001.⁷ MTC approved the

⁷ The project was originally listed under the two TIP numbers SOL110001 and SOL110002 (relative to the East and West Segments). TIP Amendment No. 2013-16 combined the two segments under one TIP ID SOL110001, and reprogrammed the funding sources and phases.

financially constrained TIP on July 18, 2013. The Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) are expected to approve and incorporate the TIP in to the Federal Statewide Transportation Improvement Program (FSTIP) in 2014.

The STA's Comprehensive Transportation Plan (CTP 2030) for Solano County envisions, directs, and prioritizes the transportation needs of Solano County through the year 2030. The plan identifies HOV lane construction on the I-80 corridor within the county.⁸ Additionally, express lanes on I-80 are identified as an operational strategy to implement the identified needs as outlined in the I-80/I-680/I-780 Major Investment & Corridor Study prepared for the STA.

Table 2.5-1 shows project GHG emissions expressed in metric tons per day of CO₂. CO₂ emissions were estimated using the Caltrans-Emfac model with EMFAC2011 emission factors and utilizing the average peak and off-peak period traffic volumes and speeds provided in the Traffic Operations Analysis Report prepared for the project (Caltrans 2014q). Average peak period and off-peak period emission calculations were combined to generate an average daily emission total. GHG emissions are presented with and without the Pavley and Low Carbon Fuel Standard (LCFS) requirements. As indicated in **Tables 2.1-23** and **2.1-26** of **Section 2.1.7, Traffic and Transportation/Pedestrian and Bicycle Facilities**, the Build Alternative will help relieve congestion in the traffic peak hour periods during the day. The net difference between the existing and build scenarios shows that even with the project, GHG emissions are predicted to decrease due mostly to the Pavley and LCFS requirements.

Assuming Pavley reductions apply to future emission rates, daily CO₂ GHG emissions were computed to decrease by approximately 202 metric tons per day under the 2020 Build Alternative conditions, as compared to existing conditions. Further in the future (i.e., year 2040), the reduction due to the project would be less than existing conditions at 37 metric tons per day, because traffic would increase substantially from planned growth. When compared to the No Build Alternative conditions, the project would have slightly higher emissions. This is because there would be higher traffic demand for the facility, as seen by the increased VMT associated with the Build Condition relative to the future No Build Alternative.

Table 2.5-1 CO₂ Emissions in Metric Tons per Day

CO ₂ Emissions	Existing (2010)	2020 No Build	2020 Build	2040 No Build	2040 Build
CO ₂ without Pavley	1,432	1,620	1,625	1,915	2,039
CO ₂ with Pavley	1,427	1,222	1,225	1,306	1,390

Source: Caltrans, 2014a; Caltrans, 2014q

⁸ Solano Transportation Authority Comprehensive Transportation Plan 2005, updates 2009; <
<http://www.sta.ca.gov/Content/10054/ComprehensivePlans.html#ahf>> accessed on March 10, 2013.

LIMITATIONS AND UNCERTAINTIES WITH MODELING

EMFAC

Although EMFAC can calculate CO₂ emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO₂ emissions due to impacts on traffic.

According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008) and a 2009 University of California study,⁹ brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO₂ 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 idling) 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 compared to the estimated emissions of the various alternatives with 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.

CARB is currently not using EMFAC to create its inventory of greenhouse gas 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, ARB is working towards reconciling the emission estimates from the fuel usage approach and the models.¹⁰

Other Variables

With the current science, project-level analysis of greenhouse gas emissions has limitations. Although a greenhouse gas analysis is included for this project, there are numerous key greenhouse gas variables that 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. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2012,"¹¹ 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 at a record high. Corporate Average Fuel Economy (CAFE) standards

⁹ Matthew Bartha, Kanok Boriboonsomsin. 2009. Energy and emissions impacts of a freeway-based dynamic eco-driving system. Transportation Research Part D: Transport and Environment

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¹⁰ <http://www.arb.ca.gov/msei/offroad.htm>

¹¹ <http://www.epa.gov/oms/fetrends.htm>

remained the same between model years 1995 and 2003 and subsequently began setting increasingly higher fuel economy standards for future vehicle model years. The EPA estimates that light duty fuel economy rose by 16 percent from 2007 to 2012. **Table 2.5-2** shows the increases in required fuel economy standards for cars and trucks between Model Years 2012 and 2025 as available from the National Highway Traffic Safety Administration for the 2012-2016 and 2017-2025 CAFE Standards.

Table 2.5-2 Average Required Fuel Economy (mpg)

	2012	2013	2014	2015	2016	2018	2020	2025
Passenger Cars	33.3	34.2	34.9	36.2	37.8	41.1-41.6	44.2-44.8	55.3-56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.6-30.0	30.6-31.2	39.3-40.3
Combined	29.7	30.5	31.3	32.6	34.1	36.1-36.5	38.3-38.9	48.7-49.7

Source: EPA 2013, <http://www.epa.gov/fueleconomy/fetrends/1975-2012/420r13001.pdf>

Second, near zero carbon vehicles will come into the market during the design life of this project. According to the 2013 Annual Energy Outlook (AEO2013):

“LDVs that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG emissions and CAFE standards over the projection period. Sales of such vehicles increase from 20 percent of all new LDV sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case.”¹²

The greater percentage of alternative fuel vehicles on the road in the future will reduce overall GHG emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

Third, California has recently adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in title 17, California Code of Regulations, Sections 95480-95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

Lastly, 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,”¹³ the Congressional Budget Office found the following results based on data collected from California: 1) freeway motorists adjust 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 declined from 2003 to 2008 as average prices for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles. More

¹² [http://www.eia.gov/forecasts/aeo/pdf/0383\(2013\).pdf](http://www.eia.gov/forecasts/aeo/pdf/0383(2013).pdf)

¹³ <http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf>

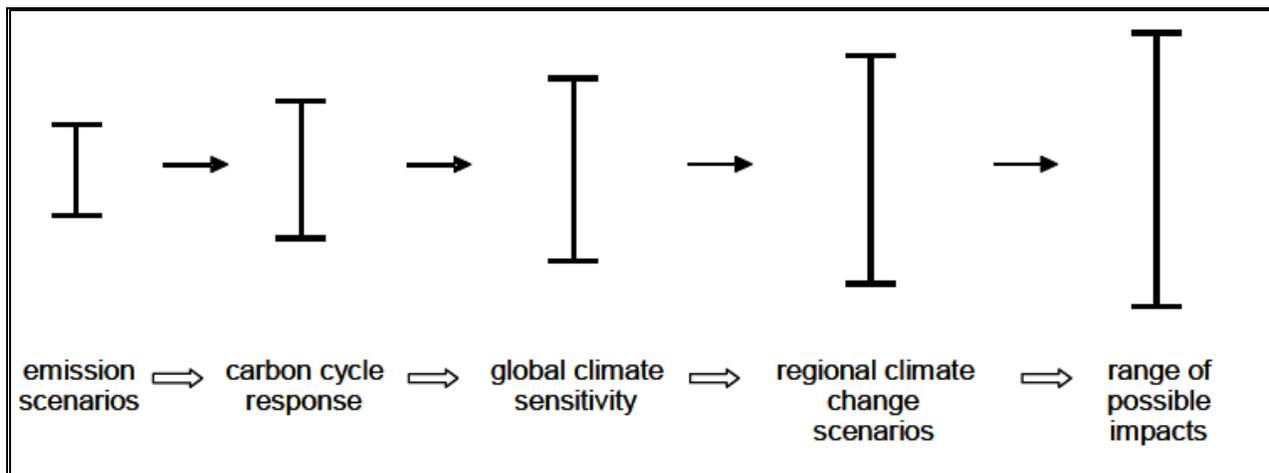
recent reports from the Energy Information Agency¹⁴ and Bureau of Economic Analysis¹⁵ also show slowing re-growth of vehicle sales in the years since its dramatic drop in 2009 due to the Great Recession as gasoline prices continue to climb to \$4 per gallon and beyond.

LIMITATIONS AND UNCERTAINTIES WITH IMPACT ASSESSMENT

Taken from page 5-22 of the National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards (July 2012), **Figure 2.5-3** illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

“Moss and Schneider (2000) characterize the ‘cascade of uncertainty’ in climate change simulations **Figure 2.5-3**). As indicated in **Figure 2.5-3**, the emission estimates used in this EIS have narrower bands of uncertainty than the global climate effects, which are less uncertain than regional climate change effects. The effects on climate are, in turn, less uncertain than the impacts of climate change on affected resources (such as terrestrial and coastal ecosystems, human health, and other resources [...]) Although the uncertainty bands broaden with each successive step in the analytic chain, all values within the bands are not equally likely; the mid-range values have the highest likelihood.”¹⁶

Figure 2.5-3 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 any modeled increase in CO₂ emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO₂ equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple

¹⁴http://www.eia.gov/oiaf/aeo/tablebrowser/aeo_query_server/?event=ehExcel.getFile&study=AEO2013®ion=0-0&cases=ref2013-d102312a&table=114-AEO2013&yearFilter=0

¹⁵ Historical Vehicle Sales: www.bea.gov/national/xls/gap_hist.xls

¹⁶ http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cale/FINAL_EIS.pdf, page 5-22

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 greenhouse gas emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas 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 percent.¹⁷

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing “new” greenhouse gas emissions. It is difficult to assess the extent to which any project level increase in CO₂ emissions represents a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

2.5.3 CONSTRUCTION EMISSIONS

Greenhouse gas 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 on-site 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 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. Currently Caltrans has not adopted GHG significance thresholds that apply to construction activities. For informational purposes, estimated GHG emissions from overall project construction were calculated.¹⁸ Construction period GHG emissions were modeled using total expected duration of 24 months within the project limits. GHG emissions are estimated to be 1408 metric tons of CO₂ over the course of the entire construction project.

2.5.4 CEQA CONCLUSION

As discussed above, both the future with project and future no build show decreases in CO₂ emissions over the existing levels; the future build CO₂ emissions are higher than the future no build emissions. In addition, as discussed above, there are also limitations with EMFAC and with assessing what a given CO₂ emissions increase means for climate change. Therefore, it is Caltrans determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination

¹⁷ 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>.

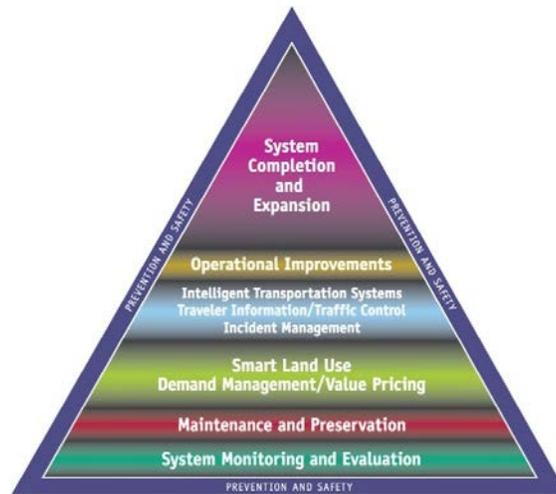
¹⁸ RoadMod Version 6.3.2 was used for this analysis.

regarding significance of 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.

2.5.5 GREENHOUSE GAS REDUCTION STRATEGIES

The Department continues to be involved on the Governor's Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 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 then-Governor Arnold Schwarzenegger's Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO₂ reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in **Figure 2.5-3**, The Mobility Pyramid.

Figure 2.5-4 Mobility Pyramid



The Department is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. The Department works closely with local jurisdictions on planning activities, but does not have local land use planning authority. The Department assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; the Department is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the U.S. EPA and ARB.

The Department is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391 (Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

Table 2.5-3 summarizes the Departmental and statewide efforts that the Department is implementing to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)¹⁹ provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

The following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

- Caltrans and the California Highway Patrol are working with regional agencies to implement Intelligent Transportation Systems (ITS) to help manage the efficiency of the existing highway system. ITS commonly consists of electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.
- In addition, STA provides ridesharing services, park-and-ride facilities, and commuter information assistance to help manage the growth in demand for highway capacity (<http://www.commuterinfo.net/>).

¹⁹ http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

Table 2.5-3 Climate Change/CO2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	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, ARB, 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 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34

Strategy	Program	Partnership		Method/Process	Estimated CO2 Savings (MMT)	
		Lead	Agency		2010	2020
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix	1.2	4.2
				25% fly ash cement mix	0.36	3.6
				> 50% fly ash/slag mix		
Goods Movement	Office of Goods Movement	Cal EPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

Source: Caltrans, 2013

Note: CalEPA – California Environmental Protection Agency; ARB - Air Resources Board; CEC – California Energy Commission

- Landscaping reduces surface warming and, through photosynthesis, decreases CO₂. The project proposes planting in the intersection slopes, drainage channels, and seeding in areas next to frontage roads as well as planting a variety of different-sized plant material and scattered skyline trees where appropriate but not to obstruct the view of the mountains. . An on-site Mitigation Monitoring Plan (MMP) for replacement of trees and shrubs will be developed by Caltrans. The MMP will specify that the mitigation plantings either will be composed of the same species and at the same ratios as those removed, or will reflect the composition and density of a reference site near the BSA. In addition, planting areas will be seeded with a native seed mixture that is similar in species and cover to what occurs in each of the oak woodland habitats. All woody plant materials will be replaced using a local native seed source. These replacement trees will help offset any potential CO₂ emissions increase.
- According to Caltrans' Standard Specifications, the contractor must comply with all local Air Pollution Control District's (APCD) rules, ordinances, and regulations for air quality restrictions. BAAQMD CEQA Guidelines provide feasible control measures for construction emissions. One of the measures that would be implemented under the Build Alternative includes minimizing idling times of construction equipment either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure, Title 13, Section 2485 of the California Code of Regulations (CCR)). Clear signage shall be provided for construction workers at all access points.

2.5.6 ADAPTATION STRATEGIES

“Adaptation strategies” refer 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, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from 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.

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011²⁰, outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme

²⁰ <http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation>

events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks .

Climate change adaptation 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, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop The California Climate Adaptation Strategy (Dec 2009)²¹, which summarizes the best-known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report²² to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- Relative sea level rise projections for California, Oregon and Washington 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.

²¹ <http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF>

²² *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at http://www.nap.edu/catalog.php?record_id=13389.

- 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.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data.

All projects that have filed a Notice of Preparation as of the date of EO S-13-08, and/or are programmed for construction funding from 2008 through 2013, or are routine maintenance projects may, but are not required to, consider these planning guidelines. The proposed project is outside the coastal zone and direct impacts to transportation facilities due to projected sea level rise are not expected.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise 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.

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 effects, 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 needed to protect the transportation system from sea level rise.

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 in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

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3.0 COMMENTS AND COORDINATION

3.1 DOCUMENT COORDINATION

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps Caltrans determine the necessary scope of environmental documentation, the level of analysis required, potential impacts, and mitigation measures as a result of project implementation, and related environmental requirements. Agency consultation for the proposed project has been accomplished through a variety of formal and informal methods, including Project Development Team (PDT) meetings and interagency coordination meetings. This chapter summarizes the results of Caltrans' efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

3.1.1 CONSULTATION AND COORDINATION WITH PUBLIC AGENCIES

PROJECT DEVELOPMENT TEAM

Regular PDT meetings provided the forum for coordination, issue resolution, and information feedback between Caltrans and Solano Transportation Authority (STA).

PDT meetings began in March 2012 at the onset of the project with Caltrans. The PDT represents various fields of expertise, including design, environmental review, traffic operations, and project management. Accordingly, the PDT convened to review the project status, address issues as they arose, and provide overall direction throughout the project development process.

AGENCY CONSULTATION

In addition to the PDT meetings, there were several other public agencies involved in environmental clearance and permitting of the Build Alternative. These agencies include the U.S. Army Corps of Engineer (USACE), U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), Regional Water Quality Control Board (RWQCB), State Water Resources Control Board (SWRCB), State Historic Preservation Officer (SHPO), and the Metropolitan Transportation Commission (MTC) Air Quality Conformity Task Force/Federal Highway Administration (FHWA).

Caltrans initiates consultation with USFWS when a project has the potential to affect a federally listed species. As discussed in **Section 2.3, Biological Environment**, Caltrans determined that the project is likely to adversely affect California red-legged frog. Formal consultation with USFWS under the Federal Endangered Species Act was initiated with the submission of a Biological

Assessment (BA) prepared for the project on March 20, 2015. A Biological Opinion (BO) was obtained from the USFWS on August 17, 2015.

Caltrans also initiates consultation with the National Marine Fisheries Service (NMFS) when a project has the potential to affect a federally-listed anadromous fish species or adversely affect designated critical habitat. Although the project would not affect habitat for central California coast DPS steelhead and Central Valley steelhead, federally-listed anadromous fish, it may affect, but is not likely to adversely affect these species. As the project has the potential to affect Central Valley steelhead and Central California Coast steelhead, federally listed anadromous fish, informal consultation with the NMFS was initiated in March 2015 with the submission of a BA prepared for the project. The NMFS agreed that because the project did not propose pile driving, there would be no likely impacts to the Central Valley steelhead and Central California Coast steelhead. Accordingly, NMFS agreed that under the Programmatic Biological Opinion for Caltrans' Routine Maintenance and Repair Activities Program in Caltrans' Districts 1, 2, and 4 issued to Caltrans by NOAA, the project is covered under Category 3. As such, no further opinion was needed.

A Section 404 permit is necessary when a project will result in fill to waters under USACE jurisdiction. A preliminary jurisdictional delineation was submitted to USACE for verification on October 29, 2014. A wetland verification site visit will be conducted during the plan, specification, and estimate (PS&E) phase of the project. The Build Alternative would result in permanent and temporary effects to wetland and water features within the Caltrans right-of-way. A Section 404 permit would be required for the Build Alternative.

A Section 401 Water Quality Certification is necessary when a project requires a Section 404 permit from the USACE, and under other special circumstances. Because the Build Alternative would require a 404 permit, a 401 Water Quality Certification from RWQCB would also be required. .

A Section 1602 Lake or Streambed Alteration Agreement with CDFW is necessary when a project will alter the flow, bed, channel, or bank of a stream or lake. The East Segment would result in work within the channel of Ulatis Creek and Horse Creek. Therefore, a Section 1602 permit would be required. No work resulting in the alteration of a stream or lake is anticipated within the West Segment of the Build Alternative.

Caltrans initiated consultation with the California State Historic Preservation Officer (SHPO) on May 12, 2015 in a letter stating that the project would not have any adverse effects to state-owned archaeological sites, landscaped, or non-structural resources that meet the National Register and/or California Historical Landmarks eligibility criteria. SHPO issued a letter of concurrence to this finding on July 2, 2015 (see **Appendix M**). The Build Alternative has established Environmentally Sensitive Area (ESA) and Testing/Treatment plans to protect known cultural resources within the APE (see **Section 2.1.9, Cultural Resources**). These plans will be filed with SHPO for concurrence with the protective measures. Issuance of a Finding of No Adverse Effect is dependent on the results of the planned subsurface testing during project construction. Pending their review and approval of completed construction phase testing, SHPO will issue a letter of concurrence for the Finding of No Adverse Effect if no resources are discovered. If resources are

discovered during the construction phase subsurface testing, additional protective and/or avoidance plans would be prepared and submitted to SHPO for concurrence.

A qualitative particulate matter (PM) analysis is required under the United States Environmental Protection Agency (U.S. EPA) Transportation Conformity rule for projects of air quality concern (POAQC). On March 10, 2006, the U.S. EPA published a final rule that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts. MTC's Air Quality Conformity Task Force (AQCTF) met on September 25, 2012 as part of interagency consultation for the Build Alternative and took action to conclude that the Build Alternative was not a POAQC.

The proposed project is listed in the 2013 Plan Bay Area financially constrained Regional Transportation Plan (RTP) which was found to conform by MTC on July 18, 2013, and FHWA and FTA made a regional conformity determination finding on August 12, 2013. The project is also included in MTC's financially constrained 2013 Regional Transportation Improvement Program (RTIP), page S3-263 (RTP Reference No. 230659 and 230660 and TIP ID SOL110001¹). The MTC 2015 RTIP was determined to conform by FHWA and FTA on December 15, 2014. The design concept and scope of the proposed project is consistent with the project description in the 2013 RTP, 2015 RTIP, and the open to traffic assumptions of the MTC's regional emissions analysis. An Air Quality Report, AQCTF Meeting Summary, RTP and TIP listings, Air Quality Conformity Checklist, and public announcements were submitted to the FHWA for review on August 26, 2015. Concurrence on the project-level air quality conformity was received from FHWA on September 22, 2015.

OLEANDER REMOVAL IN THE CITY OF VACAVILLE

Oleander removal is required as part of this project as described in **Section 2.1.8, Visual/Aesthetics**. On January 17, 2014, Caltrans staff met with the City of Vacaville to better understand the City's position on median oleander preservation, as indicated in the City of Vacaville's City Gateways Plan, which specifically recognizes the aesthetic importance of the oleanders in the I-80 highway median and calls for them to be maintained and enhanced whenever possible. As a result of the meeting, it was determined that the viewer response from the community would likely be mixed in that some drivers may respond negatively to the removal of the ornamental plantings, while others may not. Businesses along the freeway would likely respond positively to the oleander removal, as it would improve visibility of their businesses from the freeway.

The environmental document describes the project and any changes to the existing visual character and resources within the project area including the removal of oleanders (see **Section 2.1.8, Visual/Aesthetics**). Viewer groups (i.e., neighbors and motorists) within the City of Vacaville were assigned a high sensitivity to the changes within the city limits due to the local value placed on the median oleanders. Overall, implementation of the Build Alternative would result in changes to the

¹ The project was originally listed under the two TIP numbers SOL110001 and SOL110002 (relative to the East and West Segments). TIP Amendment No. 2013-16 combined the two segments under one TIP ID SOL110001, and reprogrammed the funding sources and phases.

existing visual environment. The changes would be more evident in the East Segment where roadway widening and vegetation removal would be required to accommodate new express lanes. However, the avoidance and minimization measures listed in **Section 2.1.8 (VIS-1 through VIS-6)**, which include replacement planting, would reduce the project's visual impact. As a result, the project would not substantially alter scenic vistas or scenic resources, and would not substantially degrade the existing visual character or quality of the area.

Community input was solicited during the 30-day public reviewing period of this IS/EA, from July 20, 2015 to August 18, 2015. . Members of the community had an opportunity to provide written comments or concerns during the review period. Members of the community also had an opportunity to provide comments during the public open forum that was held on August 4, 2015 (see **Section 3.1.2, Public Participation** below). The City of Vacaville was also welcomed to provide further comments during this time. No comments from either the City or members of the community regarding the removal of oleanders were received.

3.1.2 PUBLIC PARTICIPATION

NOTICE OF AVAILABILITY OF THE DRAFT ENVIRONMENTAL DOCUMENT

A Notice of Availability was circulated to the project mailing list and to the various parties listed on the distribution list (see **Chapter 5.0, Distribution List**). The notice provided information on the project including, a summary of the proposed improvements, where the environmental document could be reviewed, the address to where comments could be sent, and the closing date of the comment period. Two comments in total were received during the 30-day comment period and are included in **Section 3.2 Comments and Response to Comments** of this IS/EA.

The following methods were used to notify the public:

Newspaper advertisements: Quarter-page advertisements were placed in two local newspapers. The same newspaper advertisement ran in the Fairfield Daily Republic on July 21, 2015 and the Vacaville Reporter on July 19, 2015. The newspaper advertisements announced the availability of the draft IS/EA for review and the upcoming public open forum hearing that would be held on August 4, 2015.

Corridor Mailing: Informational mailers were sent to owners and residents of all properties within the first and second rows of land parcels adjacent to the project corridor. Approximately 1,000 mailers were mailed via US postal Service First Class Mail. The mailer contained a sentence in Spanish that directed all Spanish readers to the project website, where a Spanish version of the mailer was posted.

Website: The Caltrans website posted, for public review, the IS/EA and Appendices (<http://www.dot.ca.gov/dist4/envdocs.htm>). The same information was also posted on the Solano County Transportation Authority website (http://www.sta.ca.gov/Content/10081/Interstate_Highway_Projects.html#i80express) and the MTC website (<http://bayareaexpresslanes.org/announcements/>).

Officials/Stakeholder Notification: The project team invited the following government officials and community stakeholders to comment on the draft IS/EA:

- State and Federal Representatives
- Vacaville and Fairfield City Council Members
- Chambers of Commerce
- Business Associations
- Environmental Groups
- Libraries

The document was available for public review at the Caltrans District 4 Office, the Solano Transportation Authority Office, the Vacaville Public Library – Cultural Center, and the Fairfield Civic Center Library for public review.

PUBLIC OPEN FORUM HEARING

A public open forum hearing was held from 6:00 pm to 8:00 pm on August 4, 2015 during the 30-day review period of the IS/EA document. The intent of the public forum was to solicit comments and receive input from the public and agencies on the environmental analyses and conclusions presented in the IS/EA, including the noise study report. The public open forum hearing was held in Conference Room B of the Solano County Events Center at 601 Texas Street, Fairfield, California. The hearing utilized an open forum format, and six members of the public attended. One comment was submitted in writing during the hearing. Comments were taken into consideration during preparation of this final IS/EA document.

3.1.3 NATIVE AMERICAN CONSULTATION

Sacred Lands File searches by the Native American Heritage Commission (NAHC) were conducted in January 2012 and April 2013 and determined that no recorded resources are known within or near the project APE. At that time, letters were sent to interested Native American groups. In May 2013 additional consultation of the current project was sent to these same parties.

One response was received from Mr. James Sarmiento, Cultural Resources Manager, Yocha Dehe Wintun Nation. Mr. Sarmiento indicated in his response letter that the project is within the aboriginal territories of the Yocha Dehe Wintun Nation and that the tribe has concerns that the project may have the potential to impact undiscovered cultural concerns. A site visit with the tribe was requested to be scheduled prior to construction activities.

As discussed in **Section 2.1.9, Cultural Resources, Measure CUL-2**, if human remains are discovered and thought to be Native American, the coroner will notify the NAHC who will then notify the Most Likely Descendent (MLD). The person who discovered the remains will contact District 4 Environmental Branch so that they may work with the MLD on the respectful treatment and disposition of the remains.

3.2 COMMENTS AND RESPONSE TO COMMENTS

This section provides responses for comments received during the public review period for the draft IS/EA. Included are copies of all comment letters received up to the end of the public review period. No comments were received after the public review period. Only two comments were received and they are attached in order of receipt. **Table 3.2-1** indexes all comments received.

Table 3.2-1 Index of Comments

ID	Date of Comment	Commenter
C-1	August 4, 2015	Carolyn Burke (member of the community)
C-2	August 10, 2015	Department of Water Resources

Source: Circlepoint, 2015



I-80 Express Lanes Project Public Comment Form

Comment forms may be returned today or mailed/e-mailed to the address below. Comments must be received no later than 5:00 p.m. on August 18, 2015.

Caltrans District 4
Attn: Zachary Gifford
111 Grand Avenue, Mail Station 8B
Oakland, CA 94612
E-mail to: zachary.gifford@dot.ca.gov

Name: CAROLYN BURKE-PARK VILLAS ASSN **Date:** 8-4-2015

Affiliation (if applicable): PRESIDENT OF ASSN Bd of Mgr

Address: 318 CREEKVIEW CT, VACAVILLE, CA 95688

E-mail: CBURKE2002@AOL.COM

Comments:

THE ADDITIONAL ON-RAMP LANE BEHIND OUR FENCE
IS NOW SO CLOSE (2 1/2 FT) THAT MOTOR NOISE MAY
SURPASS THE 67 DEGREE LEVEL. ESPECIALLY WHEN
THE METERING LIGHTS ARE TURNED ON. THE TEST
HAS BEEN SHOWING 65 DEGREE AND WE REQUEST A
NEW TEST WHEN THE HOV & METER LIGHTS ARE OPERATIONAL

Please continue on back if necessary.

3.2.2 RESPONSE TO COMMENT LETTER C-1: CAROLYN BURKE

A detailed Noise Study Report was conducted for this project that evaluated existing and future noise levels with and without the project. **Appendix G** shows the locations of the noise receptors studied. The traffic noise modeling completed to establish existing, future no-build, and future build conditions (with the additional on-ramp lane from Merchant Street to Westbound I-80) assumed free-flowing traffic conditions in order to calculate the loudest hour noise levels at receptors. Noise levels are expressed in terms of the A-weighted decibel (dBA) and the one-hour equivalent sound level (Leq). The loudest hour noise levels calculated at the receptor position in question (see R-39a in **Appendix G**) were 64 dBA Leq for existing conditions and 65 dBA Leq for future no-build and future build conditions. The predicted noise levels were below the Noise Abatement Criterion of 67 dBA Leq for Category B residential land uses. A common misconception is that the loudest hour occurs during the AM or PM peak traffic hour, when traffic volumes exceed capacity condition and HOV lanes and metering lights would typically be most used. However, congestion results in much slower speeds along the mainline and ramps, which substantially reduces traffic noise levels at adjacent receptors. Additional tests during time periods when HOV lanes and metering lights are operational would not be warranted because noise levels would be expected to be less than the loudest hour noise levels calculated assuming that traffic would be freely flowing.

DEPARTMENT OF WATER RESOURCES

1416 NINTH STREET, P.O. BOX 942836
SACRAMENTO, CA 94236-0001
(916) 653-5791



August 10, 2015

Zachary Gifford
Office of Environmental Analysis, MS-8B
Department of Transportation, District 4
111 Grand Avenue
Oakland, California 94612

Initial Study and Mitigated Negative Declaration, I-80 Express Lanes Project, City of
Fairfield, Solano County, Near Milepost 17.0, Delta Field Division, SCH2015072037

Dear Mr. Gifford:

Thank you for the opportunity to review and comment on the I-80 Express Lanes Project (Project) Initial Study and Mitigated Negative Declaration (IS). The IS describes the proposal by the California Department of Transportation to provide High Occupancy Vehicle (HOV)/High Occupancy Toll lanes in both the westbound and eastbound direction of Interstate 80 from West of Red Top Road to east of Interstate 505 in Solano County. The Project would construct express lanes in the Interstate 80 (I-80) corridor through conversion of existing HOV lanes and highway widening for the new express lanes.

The North Bay Aqueduct (NBA) of the California Department of Water Resources, situated along the Fairfield Linear Park, crosses I-80 to the east of West Texas Street in the city of Fairfield. The vicinity where NBA crosses I-80 east of West Texas Street is within the boundary of the Project. Any construction activity in the vicinity of NBA may require an encroachment permit issued by DWR. Information regarding regulations and forms for submitting an application for an encroachment permit to DWR can be found at:

http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

Please provide DWR with a copy of any subsequent environmental documentation when it becomes available for public review. Any future correspondence relating to this proposed project shall be sent to:

Leroy Ellinghouse, Chief
SWP Encroachments Section
Division of Operations and Maintenance
Department of Water Resources
1416 Ninth Street, Room 641-2
Sacramento, California 95814

Zachary Gifford
August 10, 2015
Page 2

If you have any questions, please contact Leroy Ellinghouse, Chief of the SWP Encroachments Section, at (916) 659-7168 or Jonathan Canuela at (916) 653-5095.

Sincerely,



David M. Samson, Chief
State Water Project Operations Support Office
Division of Operations and Maintenance

cc: State Clearinghouse
Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, California 95814

3.2.3 RESPONSE TO COMMENT LETTER C-2: DEPARTMENT OF WATER RESOURCES

The project will obtain all appropriate permits prior to construction. Should the project result in any construction activity in the vicinity of the North Bay Aqueduct (NBA), it will be determined if an encroachment permit issued by the Department of Water Resources (DWR) is necessary. If it is determined that an encroachment permit is needed, the project will follow the regulations and guidance for submitting an encroachment permit application found at:

http://www.water.ca.gov/engineering/Services/Real_Estate/Encroach_Rel/

A copy of the final IS/EA will be provided to the DWR once it becomes available for public review.

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4.0 LIST OF PREPARERS

Solano Transportation Authority

Janet Adams, Deputy Executive Director/Director of Projects

Dale Dennis, Project Manager

California Department of Transportation

Nicolas Endrawos, Project Manager

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Chris McMorris, Lead

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WRECO Consultants

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PaleoResources Consultants

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Dana Lodico, Consultant

Square One Productions

Angela Lin, President

HT Harvey

Ginger Bolen, Senior Wildlife Ecologist

Patrick Boursier, Senior Plant Ecologist

Condor Country Consulting

Wendy Dexter, President/Principal Biologist

Sean Dexter, Project Manager

Ted Robertson, Biologist

Parson Brinkerhoff

Elizabeth Justison, Senior Supervising Engineer

Abby Caringula, Traffic Designer/Modeler

5.0 DISTRIBUTION LIST

The draft Initial Study/Environmental Assessment (IS/EA) was distributed to the following state and regional responsible and trustee agencies; and elected officials. Distribution of the draft IS/EA included hard copy, electronic media, reference to the web site in which the document is available, or a combination of these. Agency names marked with an asterisk (*) received copies through the State Clearinghouse.

In addition to the following list, over 50 local officials for the adjoining cities and counties along the project limits, stakeholders, community groups, businesses, and interested persons on the project mailing list were notified of the availability of this document and the public open forum hearing as described in **Chapter 3.0, Comments and Coordination**. Furthermore, all property owners/occupants of properties contiguous to the project limits received a project mailer informing them of the availability of the Draft IS/EA.

FEDERAL AGENCIES

Environmental Protection Agency, Region 9
Federal Activities Office, CMD-2
75 Hawthorne Street
San Francisco, CA 94105-3901

Natural Resources Conservation Service
Area 2
1170 N. Lincoln Street, Suite 110
Dixon, CA 95620

National Marine Fisheries Services
Joe Heublein
777 Sonoma Avenue Room 325
Santa Rosa, CA 95404

US Army Corps of Engineers, Sacramento
District
ATTN: Regulatory Branch
1325 J Street, Room 1480
Sacramento, CA 95814
U.S. Fish and Wildlife Service
2800 Cottage Way W-2605
Sacramento, CA 95825

STATE AGENCIES

State Clearinghouse, Executive Officer
1400 Tenth Street, Room 156
P.O. Box 3044
Sacramento, CA 95812-3044

Bay Area Air Quality Management District
Jack Broadbent
Chief Executive Officer
939 Ellis Street
San Francisco, CA 94109

California Air Resources Board*
Executive Officer Richard Corey
1001 I Street
P.O. Box 2815
Sacramento, CA 95812

California Department of Fish & Wildlife
Region 3*
Regional Manager Scott Wilson
7329 Silverado Trail
Napa, CA 94558

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Sacramento, CA 92298

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1416 Ninth Street, Room 1442
Sacramento, CA 95814

California Public Utilities Commission*
Executive Director Paul Clanon
505 Van Ness Avenue
San Francisco, CA 94102

Department of Toxic Substances Control*
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Sacramento, CA 95814-2828
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Sacramento, CA 95812

Native American Heritage Commission*
Executive Secretary
1550 Harbor Blvd, Suite 100
West Sacramento, CA 95691

Regional Water Quality Control Board
District 2*
1515 Clay Street, Suite 1400
Oakland, CA 94612

California Office of Emergency Services
530 Clay Street
Fairfield, CA 94533

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Association of Bay Area Governments
Kenneth Kirkey
Planning Director
101 Eighth Street, P.O. Box 2050
Oakland, CA 94604-2050

Metropolitan Transportation Commission
Doug Kimsey
Planning Director
101 Eighth Street – Metrocenter
Oakland, CA 94607

ELECTED/LOCAL OFFICIALS

The Honorable Barbara Boxer
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The Honorable Dianne Feinstein
Bay Area Office
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The Honorable John Garamendi
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The Honorable Mike Thompson
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The Honorable Jim Frazier
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