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

This chapter describes the environmental resources of the project areas and how the resources would be affected by the proposed project. This chapter also discusses the potential environmental impacts of the proposed project and recommended avoidance and minimization measures. This chapter discusses and addresses issues of concern pursuant to the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA).

Based on the results of technical studies that examined impacts to environmental resources, Caltrans has determined that the appropriate level of CEQA document for this project is an Initial Study. The Federal Highway Administration (FHWA) recommended that the appropriate level of NEPA document is an Environmental Assessment.

The word "significance" has been used in this document as a CEQA term. The proposed project would not significantly affect the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory. The mitigation measures identified and described in this document for the proposed project will minimize the impacts to the environment to a level below significance.

2.1. Human Environment

2.1.1. LAND USE

Affected Environment/Existing Uses

The proposed project is located along a 3.7 km (six-mile stretch) of SR 12 that is also known as Jameson Canyon Road. This portion of SR 12 runs in the east – west direction. At the west end of Jameson Canyon Road is the SRs 12 and 29 intersection, which is

within the project limits. At the east end of Jameson Canyon Road is the I-680/I-80/SR 12 interchange, which is outside the project limits.

This portion of SR 12 is a rural highway with steep hills rising on either side from an elevation of 30.48 m (100 feet), at each end, to over 243.84 m (800 feet) from 1.609 km (one mile) from north and south of the road, at the Napa-Solano county line. The land uses north and south of Jameson Canyon Road are related to agriculture—grazing lands and vineyards.

Surrounding the SRs 29/12 intersection, are industrial parks in each of the four quadrants of the intersection. To the southeast of the intersection are two privately owned, open-to-the-public golf courses. West of the SRs 29/12 intersection, Airport Boulevard begins and terminates after 1.29 km (0.8 miles) at the Napa County Airport, which is a general aviation facility. A tasting room and garden at the SRs 12/29 intersection were closed in approximately 2005, as was a nearby childcare facility.

Surrounding the I-680/I-80/SR 12 interchange are a patchwork of industrial and high-density commercial land uses that are interspersed with open spaces.

Future Land Uses

The land uses along SR 12 are zoned and projected to remain rural, agricultural, and unchanged.

The land uses at the intersection of SRs 29/12, which is in an unincorporated area known as the South Napa County Business Parks or the Napa Airport Industrial planning area, is projected to become a major regional employment center with industrial and low-density commercial uses. Very low-density residential areas are projected a quarter-mile to the northeast.

The land uses surrounding the I-680/I-80/SR 12 interchange are projected to remain the same. But medium density residential land uses are planned a one-half mile or more from the interchange.

Land uses for the project study area are guided by the Napa County, Solano County and City of Fairfield General Plans. The Napa County General Plan dates to 1993, although its land use element has been frequently updated. A Draft General Plan was released in February 2007. The Fairfield General Plan was released approximately in 2000. The Solano County General Plan dates from 1980 and several elements have been updated since that date.

Consistency with Plans

Transportation Plans

- **Regional Transportation Plan:** The widening of this portion of SR 12 is listed in the Metropolitan Transportation Commission's *Transportation Plan for the San Francisco Bay Area* (February 2005) as Reference Numbers 94074 and 94152. The conversion of the SRs 29/12 intersection to an interchange is listed as Reference Number 94075. Consequently, the proposed project is consistent with the most recent Regional Transportation Plan.
- **Transportation Improvement Program:** The widening of SR 12, Jameson Canyon Road, is listed in the Transportation Improvement Program (TIP), which was adopted by the Metropolitan Transportation Commission on July 12, 2006, and the Federal Highway Administration and Federal Transit Adminstration on October 2, 2006, as TIP ID NAP010008. The conversion of the SRs 29/12 intersection to an interchange is not yet included in the TIP, but is expected to be added in a future TIP. So, the proposed project is generally consistent with the TIP.
- **Traffic Congestion Relief Program (TCRP)**: The Transportation Congestion Relief Program was a five-year state transportation investment plan passed by the California Legislature and signed into law by Governor Gray Davis in 2000. This plan currently provides funding for environmental and design work for this proposed project.
- **Corridor Mobility Improvement Account (CMIA):** Voters in the California passed Proposition 1B—the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006—on November 7, 2006. This Bond Act deposits $4.5 billion in a Corridor Mobility Improvement Account. On March 15, 2007, the California Transportation Commission adopted a program of projects to be funded from the CMIA. The program includes $73,990,000 for first phase of the widening of SR 12 Jameson Canyon Road.
- **Solano Comprehensive Transportation Plan, June 2005:** This Plan envisions, directs, and prioritizes the transportation needs for Solano County through the year 2030. The Arterials, Highways, and Freeways Element of this Plan lists needs on routes of regional significance. One of these needs is the improvement of SR 12 West from I-80 to SR 29. The Plan discusses the improvements to SR 12 as a widening from two to four lanes and the provision of a median to separate westbound and eastbound traffic.
- **Napa County Transportation Planning Agency Strategic Transportation Plan (1999)**: This Plan includes SR 12 from SR 29 to the Solano County line, and the SR 12/29 intersection in its East/West Corridor 2. One of the Corridor 2 objectives is:

Enhance road and intersection capacities to accommodate future travel demand for commuter, visitor, and freight related trips. To accomplish this objective, the Plan proposes the widening of SR 12 to four lanes, and the improvement of the SRs 12/29/Airport Boulevard intersection. Thus, the proposed project is consistent with the NCTPA Strategic Transportation Plan.

- **Bay Area Ridge Trail:** The Bay Area Ridge Trail will ultimately be a 500+ mile trail encircling the San Francisco Bay along ridge tops. It is open to hikers, mountain bicyclists, equestrians, and outdoor enthusiasts. There are established and dedicated portions of this trail to the north and south of SR 12. To connect the portions of this trail that are to the north and south of SR 12, the Bay Area Ridge Trail Council, which plans, acquires, builds, maintains, and promotes the trail, envisions a crossing below SR 12 through a culvert. The crossing is still in the planning phases and is unfunded. Consequently, the crossing would have to be a separate project with its own environmental clearance and permits. It would probably also require additional right of way outside the culvert to meet Americans with Disability Act standards.

Habitat Conservation Plans

- **(Draft) Solano Multi-Species Habitat Conservation Plan (HCP)/Natural Community Conservation Plan (NCCP):** The HCP/NCCP's area consists of all of Solano County as well as 7,670 acres of Yolo County. The HCP/NCCP covers the protection of seventy-seven species throughout the Plan's area. The SR 12 Jameson Canyon Road is within an area of Solano County that is considered the Inner Coast Range. Among the species to be protected in this area are California red-legged frog, Swainson's hawk, and burrowing owls. The widening of SR 12 would be consistent with the HCP/NCCP if measures are taken to protect these and other HCP/NCCP identified species in this area and their habitats.

General and Community Plans

- **(Draft) Napa County General Plan (February 16, 2007):** The Napa County General Plan is being updated. Under the Circulation Element is Policy CIR-2.3: *The County seeks to provide a roadway system that maintains current roadway capacities in most locations, and is both safe and efficient in terms of providing local access. The following…improvements…will be implemented over time to the extent that improvements continue to enjoy political support and funding becomes available:*
    - *Widen Jameson Canyon Road (Route 12) by adding one additional vehicular travel lane and room for a class II bike lane in each direction*

that may also allow equestrian use. Construct a safety barrier in the centerline, straighten unsafe curves, lower the grade where possible, install turn lanes for safety to allow for parcel access as appropriate, and install a Ridge Trail crossing for pedestrian, equestrian and bicycle use.

- *Construct an interchange at the intersection of State Route 12, Airport Boulevard and State Route 29 within the most efficient footprint, including any necessary apurtenant facilities.*

- **Solano County General Plan:** The Solano County Land Use and Circulation Element was last amended in December 2004. The goal, objectives, and policies of this element are of a general nature and make no references to improvements or specific projects such as the widening of SR 12 Jameson Canyon Road. Instead, the Land Use and Circulation Element references the Solano Comprehensive Transportation Plan.

Coastal Zone and Wild and Scenic Rivers

The entire project area of SR 12 Jameson Canyon Road and the SRs 29/12 intersection is outside of coastal zones. There are no wild and scenic rivers that traverse the project area.

Parks and Recreation

There are no publicly-owned parks, recreation areas, or wildlife or waterfowl refuges that border or are near the project area. There are also no historic sites.

Two golf courses in the vicinity—the 18-hole, public-access, Eagle Vines Golf Club, which is 0.40 km (0.25 miles) east of the SR 12/29 intersection, and the 27-hole, public access, Chardonnay Golf Club, which is just over 0.80 km (one half-mile) from the SR 12/29 intersection at its closest point—are privately owned.

2.1.2.GROWTH

Regulatory Settings: The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969, require evaluation of the potential environmental consequences of all proposed federal activities and programs. This provision includes a requirement to examine indirect consequences, which may occur in areas beyond the immediate influence of a proposed action and at some time in the future. The CEQ regulations, 40 CFR 1508.8, refer to these consequences as

secondary impacts. Secondary impacts may include changes in land use, economic vitality, and population density, which are all elements of growth.

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

Affected Environment – Based on ABAG Projections 2005, Napa County is anticipated to gain 12,030 households between 2005 and 2030. In the 2005-2030 forecast period, the SR 29 corridor from Napa south to the Solano County line, including American Canyon and the Napa Airport industrial area, will dominate the county's growth. Napa is anticipated to add 5,000 households and American Canyon, 2,100. In the unincorporated Airport Industrial area, no residential housing construction is planned; growth will be exclusively commercial and industrial.

Solano County, its cities and unincorporated areas, will continue to serve the role of the affordable bedroom communities for commuters driving to Napa County and, to a greater extent, East Bay employment centers. SR 12 Jameson Canyon Road provides the only direct link for commuters traveling to Napa and Sonoma Counties from mid-county and eastern Solano county cities like Fairfield, Suisun City, Vacaville and Rio Vista. Relatively affordable housing and flat topography facilitate residential housing growth in Solano county, as do I-80 and I-680 and the Benicia-Martinez and Carquinez bridges. Attractive real estate prices are anticipated to continue driving Solano county residential construction for the foreseeable future.

Employment Projections and Jobs/Housing Balance

Napa County contains roughly the same number of employed residents as jobs. This jobs/housing balance is forecast by ABAG to remain relatively stable in the coming years with a modest increase in jobs that is insufficient to keep pace with the growth in residential housing. Of the 72,150 jobs in Napa County in 2005, exactly 50%, or 36,150, were in the city of Napa. This proportion is expected to remain unchanged through 2030 with no other city holding more than 8% of jobs countywide.

In the city of Napa, in 2005, there were 36,150 jobs and 38,670 employed residents for a deficit of 2,520 jobs. In the year 2030, the projections are for 45,510 jobs and 56,430 employed residents, which results in a growing deficit of 10,920 jobs. In the period 2005-2030, jobs are expected to grow by 26% and employed residents by 46%.

Table 2.1.2.1

Population, Housing and Employment Growth

in the Greater Project Region: 2005-2030. (from ABAG)

	Population			Households			Employment (Jobs)		
Geographic Area	2005	2030	% change	2005	2030	% change	2005	2030	% change
Napa County	134,100	153,400	14	49,290	57,430	17	72,150	91,920	27
Napa	80,300	91,500	14	29,970	34,970	17	36,150	45,510	26
American Canyon	14,300	17,200	20	4,740	6,840	44	2,520	7,930	215
Airport industrial zone	0	0	0	0	0	0	3,810	7,420	95
Solano County	423,800	581,800	37	141,100	193,840	37	148,640	217,910	47
Fairfield	106,600	147,500	38	34,490	47,850	39	49,960	74,120	48
Suisun City	28,500	38,600	35	8,760	11,770	34	4,060	6,890	70
Vacaville	97,500	127,100	30	31,350	41,350	32	30,350	45,920	51

Solano County has a serious jobs/housing imbalance with relatively few in-county jobs for its residents. In 2005, there were 148,640 jobs and 194,900 employed residents in Solano County for a jobs deficit of 46,260 jobs.

Job growth is forecast for Solano County with 47% added to the Solano County job base in the period 2005-2030. A projected 38% increase in employed residents ensures no significant improvement to the present situation and a continuing jobs/housing imbalance. The jobs deficit is projected to worsen to 51,890 in 2030. Growth in jobs is projected to be 47% with a 38% growth in employed residents.

To summarize, the rate of growth in Solano county jobs is expected to be slightly greater than the growth in county residents, but the improvement in the jobs/housing balance is negligible compared with the existing jobs deficit. For the foreseeable future, many Solano County residents will be required to commute to jobs elsewhere in the Bay Area. As another indicator of this jobs/housing imbalance, Solano County today contains the greatest proportion of long-distance commuters (more than 45 minutes each way) among the nine Bay Area counties.

These predicted employment increases may mitigate the housing growth within each county, but all projections emphasize continued demand for travel to local and regional jobs and for regional shopping needs. A significant number of in-county jobs in each of

these outlying Bay Area counties are low-wage positions in the retail and service industries that require residents to travel out-of-county for employment. This is particularly true for SR 12 Jameson Canyon Road, which is utilized by Solano County residents commuting from relatively affordable subdivisions to relatively low-wage (by Bay Area standards) jobs in Napa County.

2.1.3. FARMLANDS/AGRICULTURAL LANDS

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

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

Affected Environment – The project proposes to acquire land from private owners for additional right of way along SR 12. The acquisition of additional right of way is proposed in order to widen the roadway from two to four lanes and install a median barrier. The nature of the additional right of way acquisitions are in the form of narrow parcel strips—slivers—along SR 12 within the project limits.

The primary land use along SR 12 Jameson Canyon Road project is agricultural with 90% of the lands either rangelands or vineyards. The Solano County segment of the project traverses rangeland (43% of the total project) and very-low density residential housing (6%). The Napa county segment passes through rangeland (47%) and agricultural vineyards (23%) with the remainder low-density and very-low-density residential (7%), urban open land use (2%), and employment areas (1%). The latter are industrial parks in the vicinity of the proposed SRs 29/12 interchange, at the western terminus of the project. No agricultural parcels have been identified for acquisition for either of the build alternatives at this interchange.

Table 2.1.3.1

Land Use Along Project ROW (miles of road) (ABAG 2000)						
Land Use	Solano	% of Total	Napa	% of Total	Total	% of Total
Rangeland	2.50	43%	1.40	47%	3.89	67%
Residential	0.38	6%	0.04	2%	0.42	7%
Agriculture	0.00	0%	1.33	45%	1.33	23%
Employment Areas	0.00	0%	0.08	3%	0.08	1%
Urban Open	0.00	0%	0.12	4%	0.12	2%
Total	2.88	49%	2.97	100%	5.85	100%

Table 2.1.3.2

	Napa County		Solano County		Total Project	
Land Type	acres	%	acres	%	acres	%
S - Farmland of Statewide Importance	0	0.0	0	0.0	0	0.0
U - Unique Farmland	772	1.2	7	0.0	779	0.8
L - Farmland of Local Importance	1,962	3.0	0	0.0	1,962	2.1
G - Grazing Land	61,639	93.4	26,016	90.7	87,655	92.6
Farmland Subtotal	64,583	97.9	26,067	90.8	90,650	95.8
D - Urban and Built-Up Land	1,378	2.1	2,245	7.8	3,623	3.8
X - Other Land	0	0.0	387	1.3	387	0.4
W - Water	0	0.0	0	0.0	0	0.0
Total	65,961	100	28,699	100.0	94,660	100.0

* - Napa and Solano counties
CA Department of Conservation. California Farmland Conversion Report: 2000-2002
CA Farmland Mapping and Monitoring Program: 2004 and 2006 GIS data.

Impact –The proposed project will require additional right of way to accommodate the road widening. Portions of thirty-four parcels have been identified as being required for the proposed project. Each of the thirty-four have an agricultural land use. The partial acquisitions along the roadway would total 67.95 acres. The 67.95 acres of represents 3.5 percent of the total acreage of the thirty-four parcels.

The Williamson Act of 1965 is the principal implementation of the state of California's policy for the preservation of agricultural land including prime, non-prime and grazing lands. According to CEQA guidelines, any farmland under this Act shall be evaluated for proposed future land use in coordination with the California Department of Conservation (CDC). Similarly, under NEPA guidelines, the Farmland Protection Policy Act protects any permanent conversion of farmland. To comply with NEPA, coordination with the Natural Resources Conservation Service (NRCS) of the U.S. Department of Agriculture will assess the project impact to the protected farmland.

Six agricultural parcels with a combined acreage of 792.62 acres are under Williamson Act contracts. Some farmland owners in Napa and Solano counties are active participants in this program.

Table 2.1.3.3

Williamson Act Parcels

County	APN	Total ac.	Take ac.	Contract #
Napa	057-080-025	335.97	0.72	33082
Napa	057-080-026	155.70	0.47	44985
Solano	148-230-050	61.37	0.22	1032
Solano	148-230-080	142.50	0.89	215
Solano	148-260-050	45.28	6.00	1014
Solano	180-030-020	51.80	13.24	1014
Total		792.62	21.54	

Production on all agricultural parcels will not be significantly affected. There are two reasons for this. First, the size of each acquisition is small and the proportion of each parcel acquired also is small. The maximum acquisition for any one parcel is 6.18 acres and, the largest percentage impact on a private property owner from an acquisition of a parcel is 27% for the same 6.18-acre acquisition. The two other parcels to be completely acquired (0.93 and 0.50 acres) are owned by public entities.

A second reason why there will be no significant impact of the project on agricultural production is that each right-of-way acquisition for this project is on the periphery of the agricultural properties. Therefore, no significant acreage of farmland will become non-farmable because of interference with land patterns. Also, the project will not significantly reduce the demand for farm support services.

To take the example of the 6.18-acre acquisition identified above, 100% of agricultural production is in the form of vineyards close to the highway. Therefore, the project will

not interfere with the ability to access any of the farmlands on this property. The project design is taking steps to accommodate the need of landowners for ingress and egress to their properties, both during construction and long-term.

Avoidance, Minimization, and/or Mitigation Measures –No mitigation for farmland is proposed for the project at this time.

2.1.4. COMMUNITY IMPACTS

Regulatory Setting- The National Environmental Policy Act of 1969 as amended (NEPA), established that the federal government use all practicable means to ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings [42 U.S.C. 4331(b)(2)]. The Federal Highway Administration in its implementation of NEPA [23 U.S.C. 109(h)] directs that final decisions regarding projects are to be made in the best overall public interest. This requires taking into account adverse environmental impacts, such as, destruction or disruption of human-made resources, community cohesion and the availability of public facilities and services.

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

Community Character and Cohesion

Affected Environment – The Jameson Canyon area is mostly rural and low density housing along SR 12 Jameson Canyon Road. Most of these homes are ranches of very large parcel sizes (see Table 2.1.4.1). The rest of the area is grazing, hilly terrain. In Solano County, the hills are really steep in some places and there is very limited room for widening within the existing Caltrans right of way. The proposed acquisitions will be small, narrow strips from the ranches and grazing land. No ranch homes in Napa or Solano County will require relocation.

Demographic characteristics of the affected environment are derived from the 2000 (and 2005) U. S. Census of Population and Housing and ABAG Projections 2005: Forecast for the San Francisco Bay Area to the Year 2030.

Population, Housing and Employment Growth

ENVIRONMENTAL JUSTICE

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For year 2007, this was $20,650 for a family of four.

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

Impacts- The ethnic composition of the population, by geographic area, is summarized in Table 2.1.4.2 and the income and poverty rates are summarized in Table 2.1.4.3. These tables provide a profile of respondents in the seven square mile local project region compared with the greater project region, Napa and Solano counties.

Table 2.1.4.2 Ethnic Composition, by Census Block

Geographic Area	Popu-lation	% White	% Black/ African-American	% American Indian/ Alaskan Native	% Asian	% Native Hawaiian/ Pacific Islander	% Other races	% Two or more races	% Hispanic/ Latino
Local Project Region	5,965	71.7	7.6	0.8	9.3	0.2	4.2	6.1	11.2
Napa county, other*	123,406	80.0	1.3	0.8	3.0	0.2	11.0	3.7	23.8
Solano county, other*	143,194	70.9	8.8	0.9	4.9	0.5	8.2	2.7	19.2

* - Excludes local project region

Source: 2000 Census (SF1).

Table 2.1.4.3 Household Income by Location

Geographic Area	Households	Median Household Income	% Households Below Poverty Level*
Local Project Region	2,027	$80,038	5.9%
Napa County, other**	45,014	$49,984	6.8%
Solano County, other**	128,794	$53,000	8.7%

* - Uses 1999 data and 1999 Federal poverty guidelines

** - Excludes Census Block Groups in local project region

Source: 2000 Census (SF3), reported for a sample of Census Block Groups.

The tables indicate that in the project study area, the poverty rate was lower than the greater project region, and the local project region is similar in ethnic composition to Solano and slightly more diverse compared to Napa County. Based on an analysis of the above data, there is no evidence that residents in the surrounding aea are disproportionately comprised of low-income or minority populations. On the contrary, residents of the local project region are less likely to be in poverty than are residents of the greater project region.

The proposed project would not require any residential or business relocations. The widened road would be within an existing, highway corridor. Although the new median barrier would create a minor impact to traffic circulation, the project would not constitute any new physical or psychological barriers that would divide, disrupt or isolate

neighborhoods in the corridor. The proposed improvements would require both temporary and permanent sliver acquisitions affecting private property. Existing parking would not be affected. Private driveways that are affected by the roadway widening will be realigned where needed.

Based on the above discussion and analysis, the build alternatives will not cause disproportionately high and adverse effects on any minority or low-income populations as per E.O. 12898 regarding environmental justice.

Existing and projected population, housing and employment for the study areas, the counties of Napa and Solano, are shown in Table 2.1.2.1 in Growth, section 2.1.2.

2.1.5. UTILITY/EMERGENCY SERVICES

Utility

Seven types of utilities have been identified as being present in the project footprint. They are:

- North Bay aqueduct pipeline
- Fiber optic control cable
- Water utility line
- Overhead electricity
- Underground electricity
- Gas line
- Telephone line (AT&T)

These utilities are to be relocated as necessary to construct either of the build alternatives. All utility relocations will be within the environmental footprint of the proposed project. The potential impacts due to relocation of utilities have already been taken into account in the environmental impact assessments.

Public Services and Facilities

Police and Fire- There are no police stations and no fire stations in the local project region. There is, however, a California Department of Forestry/Napa County Fire Station located 0.7 miles west of the SRs 29/12 intersection just outside the Napa County Airport.

Hospital and Medical Facilities- There are no community medical facilities in the local project region.

2.1.6 TRAFFIC/TRANSPORTATION/PEDESTRIAN BICYCLE FACILITIES

Regulatory Settings- The Federal Highway Administration (FHWA) directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility. The Department and FHWA are committed to carrying out the 1990 Americans with Disabilities Act (ADA) by building transportation facilities that provide equal access for all persons. The same degree of convenience, accessibility, and safety available to the general public will be provided to persons with disabilities.

Traffic

Affected Environment- SR 12 is the major east-west regional corridor linking the residential housing of Solano County with local and regional employment areas and tourism in Napa County. The major north-south arterials adjoining the study area are SR 29 in Napa County, and I-80 in Solano County, which are at the western and eastern terminii of the project, respectively.

IMPACT

The source for all the information about traffic is the traffic operations report, *OPERATIONAL ANALYSIS FOR THE SR-12 WIDENING PROJECT & ROUTE 12/29 INTERCHANGE (2007).*

Existing Travel Time and Peak Period Performance

Table 2.1.6.1a summarizes AM and PM peak period performance for SR 12 at the intersections of SR 29, North Kelly Road, Kirkland Ranch Road, and Red Top Road. Only the SR 12/Kirkland Ranch Road intersection operates acceptably at Level of Service (LOS) "C." The operation of the SR 12/North Kelly Road intersection is acceptable in the PM peak period, but is approaching unacceptable, LOS "D" in the AM peak period. The operations of the SR 12/Red Top Road and SRs 12/29 intersections are unacceptable, LOS "F," in both the AM and PM peak periods.

The delay times per vehicle are also indicated in Table 2.1.6.1. The longest delays, exceeding 80 seconds, occur at the SRs 29/12 intersection.

Table 2.1.6.1: Existing Conditions – Intersection Peak Hour Levels of Service

Intersection	Control Type	Existing Conditions				LOS Standard
		AM Peak		PM Peak		
		Delay	LOS	Delay	LOS	
SR-12 / SR-29	Signal	>80.0	F	>80.0	F	C/D
SR-12 / North Kelly Road	Signal	45.7	D	34.2	C	C/D
SR-12 / Red Top Road	TWSC(2)	(1)	F	(1)	F	C/D
SR-12 / Kirkland Ranch Road	Signal	33.6	C	28.4	C	C/D

Based on the 2000 Highway Capacity Manual
TWSC – Two-way Stop-controlled (LOS reported for worst case approach)
(1) Unsignalized intersection over capacity, delay not given.
(2) The intersection of SR-12 / Red Top Road has been signalized since the data was collected in 2002.

Table 2.1.6.2 summarizes peak hour performance for the highway portion of SR 12. The operation of the segment of SR 12 between North Kelly Road and SR 29 is acceptable, LOS "D" in the peak hour, but approaching unacceptable in the AM peak hour. The operations of SR 12 between North Kelly Road and Red Top Road, and between Red Top Road and I-80 are unacceptable, LOS "F," in both the AM and PM peak hours.

Table 2.1.6.2: Existing Conditions – Roadway Peak Hour Levels of Service

SR-12 Roadway Section	Existing Conditions				LOS Standard
	LOS E	ADT	v/c	LOS	
I-80 to Red Top Road	27,000	33,800	1.25	F	C/D
Red Top Road to North Kelly Road	27,000	33,300	1.23	F	C/D
North Kelly Road to SR-29	34,500	29,800	0.86	D	C/D

v/c – Volume-to-Capacity Ratio; ADT – Average Daily Traffic
Based on the 2000 Highway Capacity Manual

Future Peak Period Performance

No Build Situation

Table 2.1.6.3 shows mixed results in the year 2035 for the operation of SR 12 at the intersections of SR 29, North Kelly Road, Red Top Road, and Kirkland Ranch Road. The SRs 29/12 intersection's operation will remain at LOS "F" in both the AM and PM peak hours; but the delay time will increase from greater than 80 seconds to between 290 and 320 seconds. The operation of the SR 12/Kirkland Ranch Road intersection will deteriorate from the existing LOS "C" to LOS "F" in the AM peak hour, and the delay time will increase from 33 to 100 seconds. In the PM peak hour, the operation of the SR 12/Kirkland Ranch Road intersection is projected to be an acceptable LOS "B." The

intersections of SR 12/North Kelly Road and SR 12/Red Top Road, which are signalized, will also have acceptable operations ranging from LOS "A" to LOS "C."

Table 2.1.6.3: 2035 No Build Conditions – Intersection Peak Hour Levels of Service

Intersection	2035 No Build			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
SR-12 / SR-29	321.5	F	290.5	F
SR-12 / North Kelly Road	29.6	C	23.0	C
SR-12 EB Ramps / Red Top Road	6.6	A	11.3	B
SR-12 WB Ramps / Red Top Road	24.6	C	11.6	B
SR-12 / Kirkland Ranch Road	99.9	F	11.0	B

Based on the 2000 Highway Capacity Manual
NB – northbound; SB – southbound; EB – eastbound; WB – westbound

Table 2.1.6.4 shows that under the No Build alternative, the operations for SR 12 between North Kelly Road and SR 29 will deteriorate from existing worse case LOS "D" to an unacceptable LOS "F"in both the AM and PM peak hours in the year 2035. The other segments of SR12 will continue to operate at unacceptable LOS "F" or "E" in the AM and PM peak hours in the year 2035.

Table 2.1.6.4: 2035 No Build Conditions – Roadway Peak Hour Levels of Service

SR-12 Roadway Segment	Peak Hour Volumes AM (PM)	2035 No Build			
		AM Peak		PM Peak	
		Base % Time-Spent-Following	LOS	Base % Time-Spent-Following	LOS
I-80 to Red Top Road	2,822 (2,574)	93.4	F	90.7	E
Red Top Road to North Kelly Road	2,996 (3,045)	94.1	F	94.4	F
North Kelly Road to SR-29	2,748 (2,478)	92.1	F	91.1	F

v/c – Volume-to-Capacity Ratio
Based on the 2000 Highway Capacity Manual

In 2035, Table 2.1.6.5 shows that the intersections that are expected to experience queuing problems are SRs 29/12 and SR 12/North Kelly Road.

Table 2.1.6.5: 2035 No Build Conditions – Queue Analysis

Intersection	EB Approach			WB Approach			NB Approach			SB Approach		
	L	T	R	L	T	R	L	T	R	L	T	R
SR-12 / SR-29	#	#		m#	m#		#	#		m#	m#	m
SR-12 / North Kelly Road	m	m	m	m	m	m	#	#		m	m	
SR-12 EB Ramps / Red Top Road	m									m	m	
SR-12 WB Ramps / Red Top Road												
SR-12 / Kirkland Ranch Road	m			m	#	m						

Based on Synchro analysis of 95th percentile queue. Worst-case (AM or PM) represented.
NB – northbound; SB – southbound; EB – eastbound; WB – westbound; L – left turn; T – through lanes; R – right turn;
"#" volumes exceeds capacity; "m" – queue metered by upstream signal

Table 2.1.6.6 indicates that in the AM peak period in the year 2035, there will be a queue on the westbound I-80 connector to SR 12.

Table 2.1.6.6: 2035 No Build SR-12 / I-80 Connector Capacity Analysis

Description	Flow on Ramps		Flow on Mainline	
	Eastbound	Westbound	Eastbound	Westbound
	SR-12 to I-80	I-80 to SR-12	I-80	I-80
2035 No Build - AM Peak				
Hourly Volumes	1,042	1,780	5,305	10,602
Number of Lanes	1	1	4	4
Service Flow Rate	2,025	2,025	9,400	9,400
Capacity	0.51	0.88	0.56	1.13
Queue	0	0	0	1,202
2035 No Build - PM Peak				
Hourly Volumes	1,481	1,093	8,630	6,193
Number of Lanes	1	1	4	4
Service Flow Rate	2,025	2,025	9,400	9,400
Capacity	0.73	0.54	0.92	0.66
Queue	0	0	0	0

1 lane (45 mph Free Flow Speed) = 2,025 pc/hr/ln

Build Situation

With the widening of SR12, Table 2.1.6.7 shows that the intersection of SR 12 and the ramps of Red Top Road and SR 12/Kirkland Ranch Road will operate at either LOS "B" or "C," which are both acceptable.

Table 2.1.6.7: 2035 Build – Intersection Peak Hour Levels of Service

Intersection	2035 No Build			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
SR-12 EB Ramps / Red Top Road	10.6	B	16.9	B
SR-12 WB Ramps / Red Top Road	18.9	B	10.9	B
SR-12 WB Ramps / Kirkland Ranch Road	28.0	C	16.1	B

Based on the 2000 Highway Capacity Manual
TWSC – Two-way Stop-controlled (Delay reported for worst case approach); AWSC – All-way Stop-controlled (Delay reported for worst case approach); NB – northbound; SB – southbound; EB – eastbound; WB – westbound

Table 2.1.6.8 shows that the operations of SR 12 are LOS "D" between Red Top Road and North Kelly Road for both the AM and PM peak hours. Only the short segment of SR 12 between Red Top Road and I-80 will opearte acceptably at LOS "C."

Table 2.1.6.8: 2035 Build Conditions – Roadway Peak Hour Levels of Service

SR 12 Roadway Section	Peak Hour Volumes AM (PM)	2035 No Build			
		AM Peak		PM Peak	
		v/c	LOS	v/c	LOS
I-80 to Red Top Road	2,955 (3,148)	0.54	C	0.56	C
Red Top Road to North Kelly Road	4,558 (4,428)	0.85	D	0.80	D
North Kelly Road to SR-29	3,974 (3,792)	0.72	D	0.84	D

v/c – Volume-to-Capacity Ratio
Based on the 2000 Highway Capacity Manual

Under the Build situation, Table 2.1.6.9 shows that none of the connector ramps between I-80 and SR 12 will have queues.

Table 2.1.6.9: 2035 Build SR-12 / I-80 Connector Capacity Analysis

Description	Flow on Ramps		Flow on Mainline	
	Eastbound	Westbound	Eastbound	Westbound
	SR-12 to I-80	I-80 to SR-12	I-80	I-80
2035 Build - AM Peak				
Hourly Volumes	1,005	1,950	5,483	10,432
Number of Lanes	2	2	5	5
Service Flow Rate	4,050	4,050	11,750	11,750
Capacity	0.25	0.48	0.47	0.89
Queue	0	0	0	0
2035 Build - PM Peak				
Hourly Volumes	2,060	1,088	8,117	6,153
Number of Lanes	2	2	5	5
Service Flow Rate	4,050	4,050	11,750	11,750
Capacity	0.51	0.27	0.69	0.52
Queue	0	0	0	0

1 lane (45 mph Free Flow Speed) = 2,025 pc/hr/ln

For the SRs 29/12 Tight Diamond Interchange configuration alternative, the intersections of SR 12/SR 29 southbound ramps, SR 12/SR 29 NB ramps, and SR 12/North Kelly Road will all perform at an acceptable LOS "A" to "C" in the AM and PM peak hours, except at SR 12/SR 29 southbound ramps in the PM peak hour, and SR 12/North Kelly Road in the AM peak hour.

Table 2.1.6.10: Tight Diamond Interchange – Intersection Peak Hour Levels of Service

Intersection	2035 No Build			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
SR-12 / SR-29 SB Ramps	29.8	C	54.9	D
SR-12 / SR-29 NB Ramps	15.0	B	8.1	A
SR-12 / North Kelly Road	60.0	E	17.0	B

Based on the 2000 Highway Capacity Manual
TWSC – Two-way Stop-controlled (Delay reported for worst case approach); AWSC – All-way Stop-controlled (Delay reported for worst case approach); NB – northbound; SB – southbound; EB – eastbound; WB – westbound

Table 2.1.6.11 shows that under the Single Point Urban Interchange configuration alternative, the operations of the intersection of SR 12/SR 29 ramps during the AM peak hour, and SR 12/North Kelly Road during the PM peak hour will be acceptable LOS "B" or "C." But, the SR 12/SR 29 ramps during the PM peak hour, and SR 12/North Kelly Road during the AM peak hour will have unacceptable LOS "D" or "E."

Table 2.1.6.11: Single Point Urban Interchange – Peak Hour Levels of Service

Intersection	2035 No Build			
	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
SR-12 / SR-29 Ramps	25.7	C	37.1	D
SR-12 / North Kelly Road	63.0	E	16.2	B

Based on the 2000 Highway Capacity Manual
NB – northbound; SB – southbound; EB – eastbound; WB – westbound

Minimization of Traffic/Circulation Impacts

The following are measures recommended in the *OPERATIONAL ANALYSIS FOR THE SR-12 WIDENING PROJECT & ROUTE 12/29 INTERCHANGE (2007)* to minimize traffic/circulation impacts.

SR-12 / North Kelly Road

Northbound Approach of North Kelly Road: Convert the northbound right turn lane on North Kelly Road to a shared through-right lane, and widen the north leg of the intersection to provide a second northbound receiving lane (with a 100 meter merge).

This measure improves the overall intersection level of service from LOS E (60.0 seconds / vehicle) to LOS D (44.4 seconds / vehicle) in the AM peak hour for the single point interchange option and improves from a LOS B (17.0 seconds / vehicle) to LOS B (15.5 seconds / vehicle) for the diamond interchange option. The v/c ratio will be 1.22 for diamond interchange and 1.00 for single point interchange.

Westbound Approach of SR-12: Add a westbound right turn lane approximately 180 to 200 meters in length with a 50 meter taper. The addition of this westbound right turn lane improves level of service; however, the right turn lane (even at 200 meters) does not exceed (and bypass) the westbound queue.

This measure improves the overall intersection level of service from LOS D (44.4 seconds / vehicle) to LOS C (22.1 seconds / vehicle) in the AM peak hour for the single point interchange option and improves from a LOS D (43.3 seconds / vehicle) to LOS C (23.6 seconds / vehicle) for the diamond interchange option. The v/c ratio will be 0.85 for diamond interchange and 0.89 for single point interchange. This measure requires additional widening of SR-12.

SR-29 / SR-12 Interchange (Tight Diamond Alternative)

Widen the SR-12 overcrossing to accommodate a second westbound left turn lane (westbound SR-12 to southbound SR-29 on-ramp) and widen the southbound on-ramp to accommodate two lanes and merging.

This improvement results in a LOS C (33.7 seconds / vehicle). While operationally superior, this modification requires providing a two-lane southbound on-ramp and substantially higher construction costs.

Transit

***Transit Bus Service*:** There is no existing transit service on SR 12 connecting Fairfield and Napa. The VINE bus service in Napa County recently inaugurated an express bus service from Napa to Vallejo along SR 29.

Parking- Parking in the project area consists of off-street parking for commercial establishments, such as the three industrial parks surrounding the SRs 12/29 intersection in Napa County. There is a proposed park-and-ride facility at the intersection of Red Top Road and I-80, in Solano County south of SR 12 Jameson Canyon Road. This facility would primarily serve commuters in the I-80 corridor.

Pedestrian and Bicycle Facilities- Both alternatives will have a two-way bike path (2.4m width) on the south side of SR 12, between the SRs 29/12 interchange and North Kelly Road, that is separated from the vehicular traffic by a concrete barrier.

2.1.7 VISUAL /AESTHETICS

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

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

SR 29 within the project area is an eligible State Scenic Highway. SR 12 is neither an eligible State Scenic Highway nor a County Scenic road.

Affected Environment- The Visual Analysis section follows the Federal Highway Administration (FHWA) Visual Impact Assessment methodology. The visual baseline of the proposed project was characterized in terms of the existing visual quality of the setting and the visual sensitivity of potential viewers. For the discussion of the Visual/Aesthetics aspect of this project, three landscape units have been established. This is based upon three criteria defined in the methodology: vividness, intactness, and unity.
Vividness is the visual power or memorability of landscape components as they combine in striking and distinctive visual patterns. Intactness is the visual integrity of the natural

or man-made landscape in the immediate environs and its freedom from encroaching elements. Unity is the degree to which the visual elements of the landscape join together to form a coherent, harmonious visual pattern. Both visual quality and viewer sensitivity were rated on a 5-point scale (Low, Low-to-Moderate, Moderate, Moderate-to-High, High). In this study, potential viewer exposure to anticipated visual change is considered as a component of viewer sensitivity.

The project visual setting is characterized below in terms of landscape units (discussed above), distinctive geographic segments with a broad unity of landscape character and visual quality.

The proposed project occupies three distinct landscape units.

Landscape Unit 1, Jameson Canyon, is a narrow east-west canyon connecting the northern San Joaquin Delta and Central Valley to the east with the Napa River and Napa Valley to the west, through low hills of the North Bay.

Landscape Unit 2 comprises agricultural and open space portions of the Fagan Creek/Napa River Floodplain.

Landscape Unit 3, the portion of the Napa River floodplain surrounding SR 29 in the vicinity of the SR 12/29 interchange and Napa Airport, is treated as a distinct landscape unit on the basis of its contrasting land use, urbanizing character, and correspondingly distinctive visual quality and sensitivity.

(See Figure 2.1.7.1: Project Landscape Setting.)

Landscape Unit 1: Jameson Canyon

This unit comprises a narrow, sparsely developed east-west canyon through the low North Bay hills that separate Green Valley, Cordelia Junction, the Central Valley, and the northern edge of the San Joaquin Delta to the east, and the Napa River floodplain and southern Napa Valley to the west. Views within the entire unit are restricted by steep, undeveloped, scenic slopes and ridges rising to over 300 m (roughly 1,000 ft.) to the north and south. Land-cover is predominantly open grassland, but a significant area of mixed evergreen forest is also prominent on slopes and drainages in the eastern half of the canyon south of the highway, several small drainages with accompanying oak riparian corridors cross the highway, and a narrow low-lying area of canyon bottom near the western mouth is planted in vineyards. A railroad track occupies the canyon bottom south of the highway and is occasionally visible though not prominent from the highway.

FIGURE 2.1.7.1

Development in the canyon is very sparse, consisting of a small number of farms and rural residences on large lots, concentrated mainly in the low-lying areas around Spurs and Miers Trails and the western portion of the canyon.

Visual quality throughout this relatively unspoiled and scenic landscape is high. Vividness and intactness of undeveloped hills, ridges, and woodland are high; legibility and overall unity of the natural pattern of grassland, wooded drainages, and narrow canyon topography is also high. See Figure 2.1.7.2 Landscape Unit 1.

The number of motorists on SR 12 within Jameson Canyon is moderately high. Both SR 12 and SR 29 are principal access routes from the central Bay Area to the Napa Valley. A high proportion of motorists are thus tourists and recreational travelers, with higher than normal levels of scenic concern and expectation and thus, viewer sensitivity.

While SR 29, which is visually degraded, is listed as an eligible State Scenic Highway, SR 12 within Jameson Canyon, which is highly scenic and intact, is not listed as eligible or scenic by either the State or County. Overall, in the absence of public policy identifying Jameson Canyon as a scenic resource of concern, viewer sensitivity of motorists within this unit is considered to be moderate.

Views to the road are very low in number within Jameson Canyon, consisting of a small number of farms and rural residences on or near the highway within foreground distances. Typical of residential viewers with foreground visual exposure, these residents would be considered to have high sensitivity. No other sensitive land uses were identified within the corridor in Landscape Unit 1.

Landscape Unit 2: Napa River Floodplain to Kelly Road

The western side of Jameson Canyon opens onto the Napa River and Fagan Creek floodplains. Predominant image types in this area include vineyards and other agriculture, grassland, and the Chardonnay Golf Course to the south of the highway. Overall visual quality of this segment of the highway is moderately high. Vivid elements include views of undeveloped grassy hillsides and ridges to the north and south, tall Eucalyptus trees, and views of the golf course fairways to the south. Intactness is high. The area remains undeveloped except for the open space of agricultural fields and the golf course. Unity is also high. See Figure 2.1.7.3 Landscape Unit 2.

Figure 2.1.7.2

Figure 2.1.7.3

Figure 2.1.7.4

As in Unit 1 viewer sensitivity of motorists within Unit 2 is considered to be moderate. Off-road viewers within this unit are relatively few. One farmstead directly adjoins the highway west of Lynch Road. In addition, the Chardonnay Golf Course is located within the visual foreground of the highway through most of Unit 2. Recreational destinations, like residences, are typically regarded as having high viewer sensitivity. However, because most adjoining portions of the golf course are level with or lower than the roadway, it is not very visible from the golf course to the proposed project, but these constitute a tiny portion of the entire facility. Overall viewer response/sensitivity from the golf course is moderate.

Landscape Unit 3: SR 29 Corridor

West of the intersection of SR 12 with Kelly Road, the land use changes abruptly from the previous agricultural and open space to commercial and industrial uses along the urbanized SR 29 corridor. In the northeast quadrant of the SR 12/29 intersection, various light-industrial facilities adjoin the frontage of SR 29, separated from the highway by a landscaped buffer/setback of earthen berms and ornamental trees. An existing office complex is located to the southeast of the interchange, with vivid stands of mature live oaks in otherwise undeveloped, open portions of the SR 29 foreground. Immediately west of the intersection, to the north and south of Airport Boulevard, large level parcels remain open but are planned for industrial development in the near future. An east-west-oriented corridor of mature live oak trees delineates the boundary of the nearest open parcel to the southwest.

The sparse riparian vegetation of Sheehy Creek is visible but relatively inconspicuous in the open parcel to the northwest. Beyond these open parcels, both well-landscaped commercial development and unattractive industrial and warehouse uses are visible at distances of 0.4 km (0.25 mi.) or more. To the northwest, tall ridges of the Sonoma Mountains are visible in the background at distances of roughly 9.66 km (6 miles).

Overall, visual quality of this unit is moderately low. Vividness is moderate, with nearby hills and background mountains contributing vivid elements, but the visual foreground lacks visual interest, consisting mainly of empty fields and industrial buildings. Intactness and unity are low due to the dominance of the visually mixed commercial and industrial facilities surrounding the airport. See Figure 2.1.7.4 Landscape Unit 3.

The number of motorists on SR 29 and SR 12 is high. Like SR 12, SR 29 is a principal access route from the central Bay Area to the Napa Valley. A high proportion of

motorists are thus tourists and recreational travelers, with higher than normal levels of scenic concern and viewer sensitivity. The interchange of the two highways is a key entry/gateway into the Napa Valley from three sources: SR 29, American Canyon, and the central and west Bay Area to the south; SR 12, the East Bay, I-5 and the Sacramento Valley to the east; and the Napa Airport to the west. In addition, SR 29 in this segment is listed as an eligible State Scenic Highway. Accordingly, despite the urban character and relatively poor visual quality of the SR 29 corridor, motorists' sensitivity is considered moderate.

The land uses in this unit, offices, industries etc.would be considered to have generally low viewer sensitivity due to the work-oriented nature of viewers' activities and the industrial zoning of the facilities.

Currently undeveloped portions of this landscape unit adjoining the project interchange are likely to be developed in the foreseeable future under the planned land use of the current County General Plan and the proposed cumulative projects known to the County. Land use planning and zoning for these parcels are industrial, and future viewer sensitivity to the road is therefore considered likely to be low.

The Visual Impact Analysis (VIA) technical report for this project provides details about the Scenic Highway Status for SR 29.

Visual Description of the Project

Major visual features of the proposed project would include:

Widening of SR 12 from the existing two-lane facility to four lanes with a concrete center median barrier, additional turn lanes, and acceleration and deceleration lanes in various locations.

Turn-arounds to accommodate acceleration and deceleration lanes at two center median openings, one in Napa County and one in Solano County, to provide local access aft.er construction of the proposed center median barrier. Widening in these locations would constitute a total of seven lanes with acceleration, deceleration, and turn lanes, plus a 14 m (46 ft) wide turnout area to each side of the highway. The turnout at Lynch Road in Napa County would incorporate re-alignment of the Lynch Road intersection.

Road widening and the addition of turn lanes at three intersections as well as signalization at two of these. The widening and addition of turn lanes at intersections

could represent a total of up to seven lanes at Kirkland Ranch and Lynch Roads, and eight lanes at Kelly Road.

Horizontal re-alignment, major cut-slopes, and construction of concrete cut-slope retaining walls up to 26 m (85 ft) in height beginning roughly 1.25 km (0.78 miles) from the eastern project terminus in Solano County. Upslope (cut) walls would be approximately 600 linear m (2,000 ft) in length; other fill-slope retaining walls in the same segment would be up to 15 m (50 ft) in height and approximately 800 linear m (roughly 0.5 miles) in length.

A major new interchange at SR12/29. SR 29 would maintain its four existing through lanes, at grade; SR 12 would accommodate its widened four lanes. Auxiliary lanes, ramps, turn lanes and detour lanes would also be added. Two interchange design alternatives, tight diamond and single point, are under consideration. Both interchange alternatives would elevate SR 12, with a combination of earthen berm embankments, MSE retaining walls, and concrete piers, with a two-span bridge over SR 29. Both alternatives would require re-alignments of SR 12 and Airport Boulevard.

Impacts- This section describes the anticipated visual impacts of the proposed project by landscape units 1,2,3 (detail discussions of units above). Under each landscape unit, impacts are organized by major visual project feature. Key viewpoints were selected within each landscape unit where these major project features/actions could potentially result in visual impacts. Computer-generated visual simulations were then prepared from each key viewpoint to provide a basis for evaluation of potential project impacts and are presented below. Visual simulations are based on proposed project alternatives as of March 2007 and do not reflect minor design revisions since that time.

Landscape Unit 1: Jameson Canyon

Widening of SR-12 and Addition of Center Median Barrier (Views from the Road). Four key viewpoints will be discussed. (Please see Figure 2.1.7.1: Proposed Landscape Setting)

Key Viewpoint 1 **-** Typical View from SR 12, Landscape Unit 1, Looking East – Figure 2.1.7.5a, (Existing Condition, Before); Figure 2.1.7.5b (After)

This viewpoint depicts visual effects of typical proposed roadway improvements, including widening from two lanes to four and addition of a 0.9 – 1.2 m (3 - 4 ft)-tall concrete center median barrier, as proposed throughout the project. In addition, widening

to up to seven lanes due to the addition of turn and acceleration /deceleration lanes is proposed at two intersections and at one turnout in this landscape unit, as discussed below. The addition of two lanes and a concrete center median barrier, and associated increases in vehicle traffic, would result in an appreciable increase in the visual magnitude and dominance of the roadway in motorists' visual foreground. Without the recommended mitigation measures, the change could potentially have a substantial adverse impact.

In order to minimize this affect to visual quality, design treatments to the barrier to reduce reflectivity and reduce its apparent height and bulk are recommended. Substantial revegetation of oak and other native species in the project right of way is also recommended to enhance vividness and intactness in the corridor visual foreground, as described in Avoidance Minimization and Mitigation Section.

Key Viewpoint 2- View of Proposed Turnout and Median Opening, Solano County - Ground View –Figure 2.1.7.6a, (Existing Condition); Figure 2.1.7.6b (Simulation)

In two locations, one in Landscape Unit 1 in Solano County and another in Unit 2 in Napa County, dominance of the highway would increase more than elsewhere due to new 14 m (46 ft) wide turnouts on each side of the highway to accommodate u-turn traffic at center median openings. The combined effect of auxiliary-lane widening and turnout construction in these two locations would be the creation of a 60 m (197 ft) -wide paved expanse at its widest point, with strong resulting visual dominance in those locations. Construction of the turnout in Unit 1 would also require a 7.6 m (24.9 ft)-tall cut-slope retaining wall on the north side of the road that would be prominently visible from the highway, as depicted in Figure (2.1.7.6b).

The height and hardscape character of this wall would contrast strongly with the natural setting, contributing to the increased dominance of the highway and an increase in urban character in its immediate vicinity. This would represent a localized adverse impact. The recommended mitigation is discussed in the Impact Minimization Section.

Encroachment on residences and associated decline in visual quality due to highway widening could occur in up to six locations within Landscape Unit 1. The VIA study provides further details.

Key Viewpoint 3- View of Horizontal Re-Alignment Segment - Aerial Overview – Figure 2.1.7.7a, (Existing Condition); Figures 2.1.7.7b, 2.1.7.7c (Simulation)

Figure 2.1.7.5a and 2.1.7.5b

Figure 2.1.7.6a and 2.1.7.6b

Figure 2.1.7.7a and 2.1.7.7b

Figure 2.1.7.7a and 2.1.7.7c

Figure 2.1.7.8a and 2.1.7.8b

Figure 2.1.7.8a and 2.1.7.8c

Key Viewpoint 4- View of Horizontal Re-Alignment Segment (Ground-Level View) - (Figure 2.1.7.8a, (Existing Condition); Figures 2.1.7.8b, 2.1.7.8c (Simulation))

Roughly between 1300 and 1800 m (4,265 – 5,905 ft) west of the eastern project terminus in Solano County, the roadway would be horizontally re-aligned to conform to highway design standards. This re-alignment would require large cuts in the steep slopes adjoining the roadway to the north, with retaining walls of up to 26 m (85 ft.) in height and approximately 600 linear m (2000 ft) in length. Portions of the existing steep slopes are currently covered with protective netting to contain falling rocks and debris, lending portions of this segment a somewhat disturbed appearance.

These actions would result in major alterations to the existing view, including an increase in dominance of the roadway, major changes in landform, and introduction of prominent uphill, cut-slope retaining walls in the immediate roadway foreground view. The magnitude and dominance of the roadway in the immediate visual foreground would increase substantially, an adverse effect as depicted in Figures 2.1.7.7b, 2.1.7.7c, 2.1.7.8b and 2.1.7.8c; however, the opening of the view corridors to highly scenic foreground and middle-ground landscape elements, that are presently strongly filtered by existing roadside trees, would have a beneficial effect.

Thus, the decline in visual intactness, unity and overall visual quality in this segment would be partly off-set by an increase in vividness due to newly exposed scenic views. With appropriate wall design measures as recommended in the Impact Minimization Section, overall visual impact in this segment could be reduced to a moderate level.

Recommended design measures include the use of context-sensitive wall treatments with lower reflectivity, less strongly contrasting color, and more naturalistic and visually interesting texture than standard cast-in-place retaining wall designs, and the stepping of walls to reduce the height and visual scale of the wall as experienced by adjacent motorists. One potential context-sensitive wall treatment, a dry-stack stone texture, is depicted in Figures 2.1.7.7b and 2.1.7.8b. Figures 2.1.7.7c and 2.1.7.8c depict another potential option (simulated carved stone texture). Final wall design measures would be developed in coordination with County representatives.

In addition to up-slope retaining walls to the north, approximately 800 linear m (roughly 0.5 miles) of down-slope retaining walls of up to 15 m (50 ft) in height would be built in the same highway segment. Much of this portion of the existing highway is currently supported by retaining walls of similar scale. However, with the exception of the single Solano County residence discussed above under highway widening impacts to residents,

these fill-slope walls would not be exposed to any sensitive viewers, and thus have negligible visual impact. Fill-slope wall construction would, however, result in considerable tree removal.

Throughout this segment of horizontal re-alignment of approximately 1.9 km (1.2 linear miles), numerous existing native live oak and bay trees would be removed to accommodate the roadway and retaining walls, primarily on the down-slope (southern) side of the highway. Nevertheless, the resulting overall effect on visual quality as seen from the road due to this tree loss is expected to be minor due to the opening of new scenic views and the resulting dominance and intactness of the surrounding scenic landscape as described above. If unique landmark trees were to be affected by the proposed project, the specific removal of such trees could constitute a decline in visual quality. However, no such unique landmark trees were identified along the existing highway shoulder.

Landscape Unit 2: Napa River/Fagan Creek Floodplain

Intersection Reconfiguration, Signalization and Addition of Lanes at Kirkland Ranch Road (Views from the Road). Two viewpoints, 5 and 6, will be discussed here.

The proposed widening and signalization at Kirkland Ranch Road and the entries to Chardonnay Golf Course and Kirkland Ranch Winery to the north of the highway are depicted in Figures 2.1.7.9a and 2.1.7.9b. The widening from four lanes to seven, the addition of a center median barrier, and the associated increase in numbers of vehicles would result in an increase in the magnitude and dominance of the roadway in the vicinity of the intersection. The increase in roadway dominance would represent a qualitative change in visual character in this location from a rural to a more urban, highway-dominated one, with a corresponding decline in visual intactness and overall visual quality. However, again, elements of the corridor landscape, notably the prominent vineyards, the golf course greens and landscaping, and the open hillsides and ridges would remain prominent and continue to dominate the focus of motorists' attention. With the implementation of the recommended measures to reduce visual intrusion of the median barriers and to enhance vividness and intactness through oak tree planting in various locations throughout the project right of way, the roadway widening, though adverse, would result in a moderate decline in overall visual quality.

Figure 2.1.7.9a and 2.1.7.9b

Figure 2.1.7.10a and 2.1.7.10b

Kirkland Ranch Road Intersection (Views to the Road)

The proposed widening would also require relocation of existing stone entry gateways to the adjacent winery north of the highway, thus resulting in a potentially adverse impact to the winery. Changes in the frontage at the Chardonnay Golf Course entrance would be minor—limited to 7 m (20 ft) encroachment into the existing lawns at the roadside.

The proposed increase in the scale of the intersection would represent a minor impact on views to the road from the adjoining winery and golf course.

Highway Widening and Center Median Barrier

The generic impacts of widening the highway and the addition of center median barriers within Landscape Unit 2 would be the same as discussed above under Landscape Unit 1. Design treatments to the barrier to reduce both reflectivity and its apparent height and bulk are thus recommended. Substantial revegetation of oak and other native species in the project right of way is also recommended to enhance vividness and intactness in the corridor.

With the implementation of the recommended median design measures, the increase in roadway dominance would represent a qualitative change in the corridor visual character to a more urban, road-dominated one, with a corresponding decline in visual intactness and overall visual quality. However, the scenic elements of the surrounding corridor would remain prominent and, with the recommended mitigation, the overall visual quality of views from the highway would remain moderately high. The VIA study report provides more details.

Key Viewpoint 6 - View of Turnout at Lynch Road, Napa County (Aerial Overview) Figure 2.1..7.10a Existing Condition; Figure 2.1.7.10b After

A second proposed turnout and un-signalized intersection reconfiguration at the median opening near Lynch Road are depicted in Figures 2.1.7.10a and 2.1.7.10b. This turnout would be less visually prominent than the other due to its location on more level terrain, which would not require a retaining wall. However, the overall roadway magnitude would be quite substantial approximately 53 m (174 ft) at the widest point as shown in this simulation.

A stand of very large eucalyptus would be removed at Lynch Road to accommodate the proposed turnout. In addition, other nearby eucalyptus roughly 200 m (656 ft) to the west would also be removed to accommodate road widening. As in Unit 1, although the

removal of these trees would have a somewhat adverse effect, their removal would not in itself result in a net decline in existing visual quality from the road, which would remain high. Also as in Unit 1, visual exposure of motorists to the turnaround and interchange would be transient and brief. However, the combined effect of the greatly expanded roadway, the additional turnouts, and the tree and barn removal in this location would be a potentially strong overall decline in visual quality at this location.

In order to off-set this decline in visual quality from the combined highway widening and tree removal, replacement tree plantings and revegetation are recommended in the vicinity of the turnouts.

Impacts of Widening on Residences (Views to the Road)

Due to encroachment of the roadway and the removal of an existing barn and trees, visual intrusion of the highway on the residence west of Lynch Road would result in a strong decline in visual quality for those residents. To mitigate this potential impact, replacement tree screening at the highway shoulder is recommended in the frontage of this residence. In addition, affected residents may augment screening in areas outside the State right of way if desired.

Landscape Unit 3: SR 29 Corridor

SR 12/29 Interchange Alternatives

Two alternatives are under study for the SR 12/29 Interchange: Single Point or Tight Diamond. Both alternatives would elevate SR 12, with the existing four-lane SR 29 passing at grade beneath a new two-span bridge.

Key Viewpoint 7- SR 12/29 Interchange (Aerial Overview) –

(Figure 2.1.7.11a, Existing Condition; Figure 2.1.7.11b Simulation of Single-Point Interchange Alternative: Figure 2.1.7.11c Simulation of Tight Diamond Interchange Alternative)

Figure 2.1.7.11a and 2.1.7.11b

Figure 2.1.7.11a and 2.1.7.11c

Figure 2.1.7.12a and 2.1.7.12b

Figure 2.1.7.12a and 2.1.7.12c

In general, both alternatives, Single point Interchange design and Tight Diamond Interchange design would visually divide the wider interchange vicinity into four distinct visual quadrants due to the obstructing effects of the elevated ramp and bridge embankments. The interchange structure would become the visually dominant feature of the landscape within a radius of roughly 0.5 km (0.333 mi) or more, including the airport entry, altering the broad interchange setting to one with a strongly urban character with adverse effects on visual quality. The VIA study report provides more details.

Single-Point Interchange Alternative

In three quadrants, the appearance of the interchange from adjoining land uses would be defined primarily by the outer earthen embankments supporting SR 12, the new Airport Boulevard/Airport entry, and the outer interchange ramps. In the northeast quadrant, the outer (westbound SR 12 to northbound SR 29) ramp would be supported by MSE retaining walls to accommodate the narrow ROW on frontages of existing industrial land uses east of SR 29.

Tight Diamond Alternative

Similar to the Single-Point Alternative, the appearance of the Tight Diamond Alternative from adjoining land uses would be defined primarily by the outer earthen embankments supporting SR 12, the new Airport Boulevard/Airport entry, and outer interchange ramps. In the northeast quadrant, the outer (westbound SR 12 to northbound SR 29) ramp would be supported by MSE retaining walls to accommodate the narrow right of way on frontages of existing industrial land uses east of SR 29; however, the alignment of this ramp under the Tight Diamond Alternative would be considerably closer to the adjoining industrial uses in the northeast quadrant, resulting in a more severe decline in visual quality for these viewers. These industrial uses, however, are considered to have low viewer sensitivity due to their land use and viewer activity types. Substantial adverse impacts are not anticipated for that reason.

Key Viewpoint 8- SR 12/29 Interchange (View from SR 29, Looking North)

[Figure 2.1.7.12a (Existing Condition); Figure 2.1.7.12b (Simulation of Single-Point Interchange Alternative); Figure 2.1.7.12c (Simulation of Tight Diamond Interchange Alternative)]

Single-Point Interchange Alternative

As shown in this figure, for north- and southbound motorists on SR 29, entry into the interchange would be characterized by visual enclosure by ramp embankments. Tree-covered ridges would remain visible in northbound views through much of the interchange. Visual quality within the interchange from SR 29 would thus be strongly influenced by the extent and quality of landscaping on the various earthen embankments, and by any architectural design enhancements applied to ramp and bridge structures and associated fixtures. North of the interchange bridge, views from SR 29 would be enclosed by tall vertical MSE retaining walls close to the roadway. The VIA study provides more details.

Tight Diamond Alternative

As shown in this figure, views within the interchange under the Tight Diamond Alternative would be visually enclosed as under the Single Point Alternative. The embankment areas within the interchange would be wider under the Tight Diamond Alternative. Views from SR 12 under the Tight Diamond Alternative would be almost similar to those under the Single Point Alternative. The signage and lighting support structures are likely to be slightly less dominant under the Tight Diamond Alternative. Overall, the Tight Diamond Alternative would be slightly superior visually to the Single Point Alternative due to the greater area of landscaped embankments in the interchange interior and the smaller quantity of concrete retaining walls.

Construction Impacts (All Landscape Units)

Both temporary and long-term visual impacts due to staging, demolition, grubbing, paving, and other construction activities would be anticipated as a result of the project, which could substantially impact motorists, residents, and businesses in some instances if not mitigated. Though temporary, some of these effects could last up to three years or more and represent substantial adverse impacts without mitigation.

Substantial construction-related visual disturbances in the foreground of the highway could have adverse impacts on motorists for the duration of the disturbance. Grubbing, if done without adequate controls, could result in unnecessary removal of trees or other major vegetation with potentially adverse effects in some instances. Demolition of roadway and relocated properties could have adverse effects on views to and from the road without adequate minimization efforts.

Most notably, if substantial fill stockpiles were introduced for later phases of construction, these could potentially have substantial adverse impacts on both motorists and adjacent land uses if not appropriately planned or mitigated.

Light and Glare Impacts (All Landscape Units)

Residences adjacent to the highway could potentially experience substantial adverse impacts from exposure to headlight glare as a result of the removal of existing roadside screening due to highway widening or CRZ (clear recovery zone) actions.

Nighttime construction could also result in adverse glare impacts to motorists and residences from construction lighting, without adequate measures to shield and direct such lighting.

Avoidance, Minimization, and Mitigation Measures- With implementation of the following measures, potential adverse project impacts would be reduced to less-than-significant levels in the long term. (See the following Tables 2.1.7.1.)

Table 2.1.7.1 Avoidance, Minimization, and Mitigation Measures by Landscape Unit

Source of Impact	Impact	Avoidance, Minimization, and Mitigation Measures	Corresponding Figures*
Landscape Unit 1: Jameson Canyon			
Highway Widening and Addition of Center Median Barrier (Views from the Road)	Change in corridor to a more urban visual character, moderate decline in visual quality due to increased roadway dominance from typical widening and median barriers.	Mitigation Measure VM-1: Architectural design treatment of center median barriers to decrease visual mass, reflectivity and color contrast. Mitigation Measure VM-2: Oak tree mitigation planting/ revegetation in project ROW throughout project corridor	Figures 2.1.7.5a, 5b Figures 2.1.7.7a, 7b
	" " in combination with grade-separation MSE retaining walls	Mitigation Measure VM-3: Architectural design measures for MSE grade-separation walls	
	" " at proposed median opening/ turnout	Mitigation Measure VM-2b: Oak tree mitigation planting/ revegetation in project ROW; concentrated planting of oak and other native vegetation adjoining turnouts Mitigation Measure VM-4: Architectural design measures for turn-out cut-slope retaining walls	Figures 2.1.7.6a, 6b
Highway Widening Impacts on Residents (Views to the Road)	Encroachment of highway, removal of landscape screening in residential frontages adjoining highway due to project CRZ clearing	Mitigation Measure VM-5a: Replacement planting within proposed new project ROW	--
	Encroachment at residence 900 m west of eastern project terminus	Mitigation Measure VM-5b: Mitigation for Wall Construction Impacts to Residents - Replacement planting and architectural design measures for retaining wall	--
Highway Re-alignment, Major Landform Alteration, and Cut- and Fill-slope Retaining Wall Construction	Increase in dominance of the roadway, major changes in landform, and introduction of prominent uphill, cut-slope retaining walls in the immediate roadway foreground view	Mitigation Measure VM-6: Context-sensitive cut-slope retaining wall design measures to be developed in coordination with local jurisdictions.	Figures 2.1.7.7a, 7b, 8a, 8b
Landscape Unit 2: Napa River Floodplain to Kelly Road			

Table 2.1.7.1 Avoidance, Minimization, and Mitigation Measures by Landscape Unit

Source of Impact	Impact	Avoidance, Minimization, and Mitigation Measures	Corresponding Figures*
Intersection Reconfiguration, Signalization and Addition of Lanes at Kirkland Ranch Road (Views from the Road)	Increase in magnitude and dominance of the roadway due to increase from 4 to 7 lanes, addition of center median barrier, increase in vehicles with corresponding decline in visual intactness and quality.	Mitigation Measure VM-1: Architectural design treatment of center median barriers to decrease visual mass, reflectivity, and color contrast. Mitigation Measure VM-2: Oak tree mitigation planting/ revegetation in project ROW throughout project corridor.	Figures 2.1.7.9a, 9b
Kirkland Ranch Road Intersection (Views to the Road)	Removal of existing stone entry gateways to the adjacent winery	Mitigation Measure VM-7: Relocation of entry gateway as part of the project right-of-way acquisition process.	Figures 2.1.7.9a, 9b
Highway Widening and Center Median Barrier (Views from the Road)	Change in corridor to a more urban visual character, moderate decline in visual quality due to increased roadway dominance from typical widening and new median barriers. “ “ at proposed median opening/ turnout; removal of large Eucalyptus stand	Mitigation Measure VM-1: Architectural design treatment of center median barriers to decrease visual mass, reflectivity and color contrast. Mitigation Measure VM-2: Oak tree mitigation planting/ revegetation in project ROW throughout project corridor. Mitigation Measure VM-2b: Oak tree mitigation planting/ revegetation in project ROW; concentrated planting of oak and other native vegetation adjoining turnouts.	Figures 2.1.7.5a, 5b
Impact of Widening on Residences (Views to the Road)	Visual intrusion of the highway on the residence west of Lynch Road due to encroachment of the roadway and removal of an existing barn and trees	Mitigation Measure VM-5a: Replacement planting within proposed new project ROW Mitigation Measure VM-8: Replacement and mitigation tree screening in the project ROW shall be implemented in the frontage of the affected residence. Mitigation Measure VM-2b: Oak tree mitigation planting/ revegetation in project ROW; concentrated planting of oak and other native vegetation adjoining turnouts.	Figures 2.1.7.10a, 10b
Landscape Unit 3: SR 29 Corridor			

Table 2.1.7.1 Avoidance, Minimization, and Mitigation Measures by Landscape Unit

Source of Impact	Impact	Avoidance, Minimization, and Mitigation Measures	Corresponding Figures*
SR12/29 Interchange Alternatives	Decline in visual quality of vicinity due to interchange construction; to enhance gateway function and community image	Mitigation Measure VM-9: Revegetation of SR 12/29 Interchange. Substantial revegetation with oak and other native species on both interior and exterior interchange embankments to create a landscape buffer between the interchange structure and surrounding land uses, to enhance the gateway image of the interchange, and to enhance vividness and intactness within the interchange. Mitigation Measure VM-10: Architectural and landscape design enhancement of SR 12/29 Interchange.	Figures 2.1.7.11a, 11b, 11c Figures 2.1.7.12a, 12b, 12c
Construction Impacts (All Landscape Units)	*Temporary and long-term visual impacts due to paving and other construction activities, staging, grubbing and demolition* *Visual impact from substantial spoil storage in viewshed*	Mitigation Measure VM-11: Construction Mitigation Measures Cleaning and grubbing shall only occur within excavation and embankment slope limits as identified during project design. Existing vegetation outside of cleaning and grubbing limits shall be protected from the contractor's operations, equipment and material storage. Unsightly material and equipment storage shall not be visible within the foreground of the highway. Where such siting is unavoidable, material and equipment shall be visually screened. Construction, staging, and storage areas shall be screened by visually opaque screening whereever they will be exposed to public view for extended periods of time. All areas disturbed by construction, staging and storage shall be revegetated immediately following completion construction. - Fill stockpiles, if required, shall be sited outside of the visual foreground of SR 12.	--

Table 2.1.7.1 Avoidance, Minimization, and Mitigation Measures by Landscape Unit

Source of Impact	Impact	Avoidance, Minimization, and Mitigation Measures	Corresponding Figures*
Light and Glare Impacts (All Landscape Units)	Glare impacts to motorists, residents due to fugitive construction lighting	Mitigation Measure VM-12: Construction Lighting Mitigation. Limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.	
	Headlight glare impacts to roadside residents due to CRZ clearing	Mitigation Measure VM-5a: Replacement planting within proposed new project ROW	

2.1.8. CULTURAL RESOURCES

Regulatory Setting

In this document, "cultural resources" is used to refer to all historic and archaeological resources, regardless of significance. "Historic resources" and "historic properties" refer to those cultural resources that have been listed or found eligible for listing in the National Register of Historic Places (NRHP) and/or the California Register of Historic Places (CRHP).

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures regarding historic properties, defined as sites, buildings, structures, districts, and objects listed in or eligible for the NRHP. Section 106 of NHPA requires federal agencies to take into account the effects of their undertakings on such properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by ACHP (36 CFR 800). On January 1, 2004, the *Programmatic Agreement Among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (hereafter, the PA) went into effect for all Caltrans projects, both state and local, with FHWA involvement. The PA takes the place of the ACHP's regulations, streamlining the Section 106 process and delegating certain responsibilities to Caltrans.

Under California law, cultural resources are protected by the California Environmental Quality Act (CEQA), as well as Public Resources Code Section 5024.1, which established the CRHP. Section 5024 requires state agencies to identify and protect state-owned historic resources that meet NRHP listing criteria. Section 5024.5 further requires state agencies to provide notice to, and to confer with the State Historic Preservation Officer (SHPO) before altering, transferring, relocating, or demolishing state-owned historic resources.

Affected Environment- A review of existing literature documenting cultural resources in the project vicinity, archival research, and an intensive field survey for archaeological and architectural resources in the project study area were completed over a three-year period beginning in January 2003. A record search was conducted at the Northwest Information Center (NWIC) at Sonoma State University, through the Office of Historic Preservation's California Historical Resources Information Center, on December 6, 2002, and updated on June 21, 2005. Research was also conducted at the Caltrans Library, Napa County Historical Society, Solano County Archives, Solano County Public Library-Fairfield Branch, Solano County Assessor's Office, California State Library, California State Archives, California State Railroad Museum Library, and the Shield Library at the University of California, Davis.

Prior to the finalization of the project footprint, a project study area was used for research and survey efforts. This study area was larger than what was later finalized to be the Area of Potential Effect (APE). In accordance with the PA, the APE was established in consultation with Caltrans Office of Cultural Resource Studies Professionally Qualified Staff (PQS). The APE maps were signed by Caltrans staff, on March 23, 2007. The Archaeological APE encompasses all proposed areas of direct impact, including existing and proposed right-of-way, staging areas, and easements. The Architectural APE includes the area bound by the Archaeological APE, as well as any built properties immediately adjacent to the project to take into account the potential for indirect effects.

An Archaeological Survey Report (ASR) was completed to document the archaeological survey efforts in June 2006. The thirty-six archaeological surveys previously conducted within 0.40 km (0.25 miles) of the project study area were studied and reviewed. An archaeological survey was performed by PQS archaeologists for this project but did not result in the identification of any prehistoric archaeological or historic archaeological materials within the study area. The ASR identified two prehistoric and three historic

cultural resources, which had been previously recorded within a 0.40 km (0.25 miles) of the APE; however, no archaeological resources were identified within the APE.

Architectural resources were documented in a Historic Resources Evaluation Report (HRER), which was completed in May 2006. The HRER identified thirty-six properties within the Study Area. A PQS architectural historian identified eleven properties to be historic-era, i.e. constructed in or prior to 1960. The remaining properties were documented to be exempt from evaluation as outlined in Attachment 4 of the PA. Ten of the eleven evaluated properties were determined to not be eligible for listing in the NRHP. The remaining property, the Greenwood House, had been previously determined eligible in 1978, but since that time has been relocated to a business park. The house does not meet the National Register criteria for a moved building, and, thus, was determined to no longer be eligible for listing in the NRHP.

Completed in May 2007, a Historic Property Survey Report (HPSR) summarizes the findings of the ASR and HRER: eleven evaluated architectural resources, none of which were determined to be eligible for listing in the NRHP, nor were they be determined to be historical resources for the purposes of CEQA. In accordance with the PA, Caltrans has determined a Finding of No Historic Properties Affected.

Impacts- The HPSR concluded with a Finding of No Historic Properties Affected, and was transmitted to SHPO on May 7, 2007. SHPO concurred with the finding of No Historic Properties Affected on July 3, 2007 (for a copy of the concurrence letter, see Appendix E).

Although no historic resources were identified within the project boundaries, it is still possible that buried archaeological deposits exist. 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.

If human remains are discovered, State Heath 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 PRC Section 50.97.98, 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 Descendent (MLD). At this time, the person who discovered the remains will contact Jennifer Darcangelo, Chief, Office of Cultural Resource Studies, 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.

Avoidance, Minimization, and/or Mitigation Measures- No mitigation is required as no historic resources were identified within the project APE. Therefore, further consultation with SHPO will not be required for this project.

2.2. Physical Environment

2.2.1. HYDROLOGY AND FLOODPLAIN

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

In order to comply, the following must be analyzed:

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

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

Affected Environment – Jameson Canyon area has a mild and wet winter, but a hot and dry summer. The mean annual rainfall is approximately 50.8 cm (20 inches) according to the District 4 "Mean Annual Rainfall Map" dated September 1968. According to Caltrans District 4 the rainfall intensity is 3.30 cm (1.3 inches) in one hour for return period 100 years.

Jameson Canyon proposed roadway alignment lies on the northern side of Jameson Canyon. The south side of the alignment is an embankment leading to the Southern Pacific right-of-way at the bottom of the Canyon. The hills on the north and south of Jameson Canyon rise 214 m (700 ft) to 275 m (900 ft). The highest peak in the project

area is Elkhorn Peak, at 405 m (1330 ft) elevation, about 3 km (1.8 miles) north of the Canyon. Jameson Canyon. This highest peak drains both to the east and the west from a ridge near Creston, in the center of the Canyon. The Canyon drains into Fagan Creek and Sheehy Creek in the west, and to an unnamed creek in the east.

According to Caltrans' policy, when upgrading the existing drainage facilities, the peak discharge should be limited to the flood frequencies so as to not exceed the existing constraints. Therefore, for all major cross culverts, the existing capacities are employed for the culvert design.

There are ten existing culverts, which have a total drainage area of approximately 1416 hectares (3500 acres).

In the proposed SRs 29/12 interchange area, there are eight existing culverts, which run across SR 29 within the project limits.

Capacity of the culverts and pipes are analyzed based on free outfall and the existing allowable headwater depth. In reality, surcharging can occur in the system and the culverts can pass more or less flow depending on conditions upstream and downstream of the culvert.

Impact – The project will not affect the hydrology for offsite drainage facilities owned by Caltrans, the County of Solano, the County of Napa, Southern Pacific Railway Company, or any other entity. At the same time, converting the existing 2-lane highway to a 4-lane conventional highway with 3.6 m (11.81 ft) median openings will not change the hydrology or hydraulics of any of the waterways crossing the highway.

To minimize impacts to both upstream and downstream of the floodplain areas, special effort will be made to maintain the existing culvert capacity at this crossing. Routine construction procedures are required to minimize impacts on the floodplain.

Avoidance, Minimization, and/or Mitigation Measures – In the Jameson Canyon area the basic consideration of drainage design is to protect the highway against damage from storm water. This project proposes to extend all the major cross culverts, and the proposed drainage facilities will collect the additional runoff created by adding impervious area to the drainage shed. The proposed major cross culverts to be extended are listed as follows:

(i) At shed A4, the existing culvert is proposed to extend 25 m (80 ft) in length in order to accommodate the 3.6 m (11.81 ft) median and new section of roadway. Therefore the existing 1830 mm x 1830 mm (6 ft x 6 ft) culvert will have about a total length of 42 m (138 ft) across the highway.

(ii) Similarly at shed A5, a new section of 1220 mm x 1220 mm (4 ft x 4ft) reinforced concrete box (RCB) in a length of 25 m (80 ft) is proposed to add to 1220 mm x 1220 mm (4 ft x 4 ft) RCB.

(iii) At shed A6, a 30 m (100 ft) long of 1200 mm (4 ft) corrugated steel pipe (CSP) is proposed to connect to outfall of the 1450 mm x 900 mm (4.8 ft x 3 ft) corrugated metal pipe arch (CMPA) with a junction structure.

(iv) At combined shed A7 & A8, the existing 3050 mm x 1520 mm (10 ft x 5 ft) RCB is proposed to extend about 25 m (80 ft) at the downstream of the unnamed creek.

(v) At shed A8, a 1350 mm x 50 m (4.5 ft x 165 ft) CSP is proposed to replace 1800 mm x 1100 mm x 40 m (6 ft x 3.67 ft x 130 ft) CMPA.

(vi) At shed A9, the existing 1220 mm x 1220 mm (4 ft x 4 ft) RCB is proposed to extend 20 m (65 ft) in length at the outfall.

(vii) At shed A10, the existing double 1830 mm x 915 mm (6 ft x 3 ft) RCB will be required to extend 10 m (30 ft) at the downstream for the median and new roadway section.

For the proposed SRs 29/12 interchange area the basic consideration of drainage design is to protect the highway against damage from storm water, taking into account the effect of the proposed improvement on traffic and property. This project intends to extend all the major cross culverts, and the proposed drainage facilities will collect the additional runoff created by adding impervious area to the drainage shed. The preliminary recommendations for the two proposed build alternatives, a Single Point interchange and a Tight Diamond interchange, are as follows:

(i) On SR 29 south of the intersection, at approximately station 11+20, there are no significant changes on the existing roadway section, and the existing 1830mm x 2440mm

(6 ft x 8 ft) RCB is still in sound condition, therefore the 1830 mm x 2440 mm (6ft x 8 ft) RCB will remain and no modifications are required.

(ii) On SR 29 north of the intersection, at approximately station 24+20, the existing 2440 mm x 2440 mm (8'x 8') RCB is proposed to extend about 3.66 m (12 ft) and 1.22 m (4 ft) at the upstream and downstream respectively to accommodate the proposed auxiliary lanes.

Culvert/Pipe Hydraulic Capacity

Capacity of the culverts and pipes was analyzed based on free outfall and the existing allowable headwater depth. In reality, surcharging can occur in the system and the culverts can pass more or less flow depending on conditions upstream and downstream of the culvert.

Flood Plain

Affected Environment – In the Jameson Canyon Area a small portion of the project limits is within the 100-year floodplain. The approximate location in Napa County is KP 3.0. The existing cross culvert is encroached in this floodplain.

In the Interchange area, a drainage course is within the 100-year floodplain is located in Napa County at K.P. 3.0 (P.M. 1.90).

Impact – The existing 1830 mm x 1830 mm (6 ft x 6 ft) RCB is about 16 m (57 ft) long in the direction of flow. The proposed downstream extension is about 25 m (80 ft) long in order to accommodate the 3.6 m (11.81 ft) median and new section of roadway. The extension of the RCB will be no significant impact to 100-year hydraulic condition as follows:

To minimize impacts to both upstream and downstream of the floodplain areas, special effort will be made to maintain the existing culvert capacity at this crossing. In order to do that the existing culverts will be upgraded as discussed above. Caltrans standard construction procedures will be implemented to minimize impacts on the floodplain during construction.

2.2.2. WATER QUALITY AND STORM WATER RUNOFF

Regulatory Setting- The primary federal law regulating Water Quality is the Clean Water Act; (CWA) issued by the U.S. Environmental Protection Agency (EPA). The EPA delegated its authority in California to the State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (RWQCB). The RWQCB prepares and adopts the Water Quality Control Plan, (Basin Plan), a master policy document for managing surface and groundwater quality in the region. The State Water Resources Control Board and the Regional Water Quality Control Board issue permits which implement the standards included in the Basin Plan as well as other requirements of the State Water Code and the federal Clean Water Act.

Section 401 of the CWA requires a water quality certification from the State Board or Regional Board when a project: 1) requires a federal license or permit (a Section 404 permit is the most common federal permit for Caltrans projects), and 2) will result in a discharge to waters of the United States.

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit system to regulate municipal and industrial storm water discharges, including discharges from highways. To ensure CWA compliance and facilitate processing of routine projects, the SWRCB has issued Caltrans a blanket NPDES Statewide Storm Water Permit to regulate storm water discharges from Caltrans facilities (Order No. 99-06-DWQ, CAS000003).

In addition, the SWRCB has issued a statewide Construction General Permit for construction activities (Order No. 98-08-DWQ, CAS000002), that applies to all storm water discharges from land where clearing, grading, and excavation result in disturbances of at least 0.4 hectares (1 acre) or more. Construction activity that results in soil disturbances of less than 0.4 hectares (1 acre) is subject to the General Permit if the construction activity is part of a larger Common Plan of Development totaling 0.4 hectares (1 acre) or more of soil disturbing activities, or if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. All projects that are subject to the construction general permit require a Storm Water Pollution Prevention Plan (SWPPP). Caltrans' construction projects that are less than 0.4 hectares (1 acre) need to incorporate Water Pollution Prevention Plans (WPCP).

Affected Environment – This project is within the San Francisco Bay Regional Water Control Board (RWQCB) jurisdiction (Region 2), which is responsible for

implementation of State and Federal water quality protection laws and regulations in the vicinity of the project site. The water quality section will be discussing existing condition, effects and impacts on storm water and on ground water for both alternatives for this project.

Storm Water- The western portion of the project, including the proposed interchange, lies within the Napa River- San Pablo Watershed, (hydrologic sub-area no. 206.50). The eastern portion of the SR 12 widening project lies with the Fairfield-Suisun Watershed, (HSA nos. 207.21 (Benicia) and 207.23 (Suisun Slough).

Storm water from the projects drains through a series of open ditches and pipes to the various tributaries along the project limits. To the west, two primary creeks affected by that project are Sheehy Creek, north to the project and Fagan Creek, south of SR 12. Both creeks are tributaries of the Napa River, which drains into the Carquinez Strait and eventually San Pablo Bay. The eastern portion drains through a series of tributaries and makes its way to the Suisun Slough, which eventually drains to the Suisun Bay.

The existing beneficial use of Napa River include agricultural supply, cold freshwater habitat, ocean, fish migration, municipal and domestic supply, navigation, preservation of rare and endangered species, water contact and non-contact recreation, fish spawning, warm freshwater habitat, and wildlife habitat. Suisun Slough's beneficial uses include water contact and non-contact recreation, fish spawning, warm freshwater habitat, and wildlife habitat.

The Napa River, approximately 3.2 km (2 miles) west of the project, is listed per Section 303d for nutrients, pathogens, and sedimentation/ siltation. Suisun Slough, 2.4 km (1.5 mi) east, is impaired for diazinon.

Ground Water- This project is located in the *Napa Valley and Suisun/Fairfield Valley Groundwater Basins*. The existing beneficial uses of both these groundwater resources according to the Basin Plan include municipal and domestic water supply, industrial process water supply, industrial service water supply, and agricultural water supply.

Impact-

Storm Water- Caltrans has performed many studies to monitor and characterize highway storm water runoff throughout the State. Pollutants of Concern in Caltrans runoff found from the "Final Report of the Caltrans BMP Retrofit Pilot Program", were phosphorus, nitrogen, copper (total or dissolved), lead (total or dissolved), zinc (total or dissolved),

sediments, general metals (unspecified metals), and litter. Some sources of these pollutants are natural erosion, phosphorus from tree leaves, combustion products from fossil fuels, trash and falling debris from motorists, and the wearing of break pads.

The SR12 Jameson Canyon Road widening will disturb approximately 63 hectares (155 acres) and add 13.3 hectares (33 acres) of new pavement. The SRs 29/12 interchange will disturb about 24.5 hectares (60.5 acres) under both alternatives and add four hectares (ten acres) under the alternative 1 (the Tight Diamond) configuration and five hectares (12.4 acres) under alternative 2 (the Single Point). The added pavement for the improvements will increase roadway runoff; however, the project will result in less than significant impact to the beneficial uses and water quality objectives of the receiving water bodies with the incorporation of erosion control measures, and design pollution prevention and treatment BMPs.

Sheehy Creek will be affected due to the addition of the southbound auxiliary lane. The western detour for the single point interchange will temporarily impact Fagan Creek; however with the inclusion of construction site BMPs and erosion control measures, sediment during construction is expected to be minimal.

The no build would have no added water quality impacts than what already exists.

Ground Water- Groundwater may be encountered during excavation work for the cross culvert extensions and pile work for the bridge at SRs 29/12. Early discussion will be initiated regarding the handling and disposal of groundwater water during construction. The groundwater will need to be tested for potential contamination as a part of the Hazardous Waste Site Investigation. Handling and disposal of the groundwater will be based on the level of contaminants reported in the Caltrans Site Investigation Report.

(a) Construction Site Best management Practices (BMPs)

BMPs are implemented during construction activities to reduce pollutants in storm water discharges throughout construction. Grading of existing slopes will be required. Temporary silt fence, stockpile cover, stabilized construction entrance/exit and temporary soil stabilizers are some of the temporary erosion and water pollution control measures that may be utilized in combination to prevent and minimize soil erosion and sediment discharges during construction. Given a soil disturbance of greater than 0.4 hectares (1 acre), a Storm Water Pollution prevention Plan (SWPPP) will be developed during construction. This dynamic document addresses the deployment of various erosion and water pollution control measures that are required to changing construction activities.

(b) Permanent Design Pollution Prevention BMPs

Design Pollution Prevention BMPs are permanent measures to improve storm water quality by reducing erosion, stabilize disturbed soil areas, and maximize vegetated surfaces. Erosion control measures will be provided on all disturbed areas to the extent feasible. These measures can utilize a combination of source and sediment control measures to prevent and minimize erosion from soil disturbed areas. Source controls can utilize erosion control netting in combination with hydroseeding. The biodegradable netting is effective in providing good initial mechanical protection while seed applied during the hydroseeding operation germinates and establishes itself. Other forms of source control such as tacked straw may also be used when applicable. Sediment controls such as biodegradable fiber rolls can be used to retain sediments and to help control runoff from disturbed slope areas. These measures will be investigated during the design phase.

Outlet protection and velocity dissipation devices placed at the downstream end of culverts and channels are also Design Pollution Prevention BMPs that reduce runoff velocity and control erosion and scour. The need of these devices for this project will also be further investigated during the design phase.

(c) Permanent Treatment BMPs

Treatment BMPs are permanent devices and facilities treating storm water runoff. Caltrans approved Treatment BMPs are Biofiltration Swales, Infiltration Basins, Detention Basins, Traction Sand Traps, Dry Weather Flow Diversions, Media Filters, and Gross Solids Removal Devices (GSRDs). This project will incorporate Treatment BMPs to the maximum extent practicable. Consideration of Treatment BMPs will follow the Evaluation Documentation Form process and documented in the Storm Water Data Report for this project.

Currently we anticipate that 12 hectares (30 acres) of pavement will be treated along SR 12. At the intersection of SRs 29/12, we anticipate that 3 hectares (7 acres) of pavement will be treated. One hundred percent treatment is not feasible primarily due to environmentally sensitive areas, the geological terrain, and right of way constraints.

Biofiltration swales and strips are being proposed along SR 12. Biofiltration swales are vegetated channels that receive storm water runoff. Biofiltration strips, also known as vegetated buffer strips, are vegetated sections of land over which runoff flows as overland sheet flow. Both biofiltration strips and swales are mainly effective at removing

debris and solid particles as well as some dissolved constituents that are adsorbed to the soil surfaces.

Biofiltration swales will be incorporated where drainage ditches are being proposed to convey pavement runoff without large amount of off-site shed and where access for maintenance is feasible. Biofiltration strips will be provided in locations where side slopes are 4(H):1(V) or flatter and a minimum width (in direction of flow) of 3.6 m (12 ft) can be obtained within State right of way.

A possible infiltration/ detention basin in the southwest quadrant of the interchange will also be reviewed during design for feasibility.

2.2.3. GEOLOGY / SOILS / SEISMIC / TOPOGRAPHY

2.2.3.1. Geology/Soils

Affected Environment – The SR 12 Jameson Canyon Road lies on the eastern edge of the California Coast Ranges, a complex, folded, northwest-trending range. The ranges consist mostly of folded and faulted sedimentary rocks with minor metamorphic and volcanic components. The region is highly seismically active, with numerous active or potentially active faults nearby. In addition, the major San Andreas, Hayward, and Calaveras Faults are near enough to produce significant ground shaking at the site. The Green Valley Fault lies just 1.2 km (0.74 miles) east of Jameson Canyon, and marks the boundary of the Coast Ranges and the Great Valley alluvial plain to the east.

Jameson Canyon lies between Green Valley Fault Zone and the West Napa Fault Zone. The Canyon lies in the Eocene Markley Formation. The Markley Formation is folded with folded axes trending northwest. The Canyon drains both to the east and west. The high point of the canyon floor, near Creston, roughly coincides with the axis of an anticline. Jameson Canyon is a rare east-west trending feature in the northwest-trending Coast Ranges.

At the SR 12 Jameson Canyon Road, the Markley formation exposed in the cut slopes consists of gray silstone and fine- to medium-grained, micaceous, arkose sandstone. At some locations in the Markley Formation, clay layers may cause sliding. Older Alluvium deposits are located at the western end of the project.

The proposed SRs 29/12 Interchange Area, located in the Napa Valley, just east of the Napa River, is contained within the Coast Range Geomorphic Province of California. The province is characterized by a series of northwesterly trending ridges, faults, and valleys. It is bounded on the east by the Great Valley and on the west by the Pacific Ocean.

The ground level is generally flat with an average ground elevation of 22 m (72 ft) with reference to the mean sea level. The drainage is towards east.

The project site is located at the western end of Jameson Canyon, where alluvial deposit from the canyon are truncated by the south-flowing Napa River. Ponds have been constructed near the project area using the tidal influence of the San Pablo Bay to the south. At the intersection of SRs 29/12, the geology consists of undifferentiated Quaternary alluvium originating from Jameson Canyon. The proximity to the Canyon would suggest the underlying material consists of gravel and sand with minor clay lenses. However, the soil composition may vary over a short distance. Thus, site-specific powered borings will be needed to better characterize the sub-surface soil and rock conditions.

The soil survey map produced by the Soil Conservation Service (1978) indicates that soils within the project area may consist of the following soil series: Bale Series, Coombs Series, Fagan Series, Haire Series and Hambright Series. The Unified Soil Classification System was used to classify all types of soils.

The climate at the project site is generally of Mediterranean type. Most of the rainfall occurs from October through April—minimum 5.08 mm (0.2 inches) and maximum 10,160 mm (400 inches). Temperatures range from 5 to 30 Celsius throughout the year.

Topography and Drainage- Please see Section 2.2.1. in Hydrology, Affected Environment.

There is an abandoned pumping station and water line on the north side of SR 12 near the intersection of Red Top Road. The pumping station and water line will need to be removed prior to construction. Several small farming structures will need to be relocated as well.

2.2.3.2 *Seismicity*

Mualchin (1996) lists active faults around the project area. Based on the data provided in the California Seismic Hazard Map.

The active Green Valley Fault borders the eastern end of Jameson Canyon, and is the controlling fault for this site. It is the northern extension of the Green Valley/Concord Fault. It intersects SR 12 at the eastern end of Jameson Canyon, near the intersection of 12 and 80. The Green Valley/Concord Fault is a Holocene-active fault. Mualchin (1996) lists the Maximum Credible Earthquake Magnitude as 6.75.

Rockfall has been a recurring problem at this cut slope for several years. This problem is prevalent during intense rainstorms and usually boulders of varying sizes fall onto the highway. For the embankment construction, ground improvement techniques may be needed prior to fill placement. There are no settlement problems at the site. There may be elastic ground heave problems where deep excavations are made.

Impacts- Jameson Canyon is a narrow canyon area where bedrock is exposed at most of the locations, therefore, the effect of seismic shaking should be minimal.

Land slides on the south side of the Canyon will not affect the alignment since it is somewhat protected by the creeks and railway right-of-way to the south.

In general, any excavation that removes the lower portion or toe of a landslide will lead to destabilization of the slope and could cause landslides to reactivate. This risk of slope instability shall be greater if planned excavations increase in height. On the other hand, by reducing the amount of excavations and their distance from existing slide areas will reduce the risk of triggering landslides. Reducing the risk from slope instability will help to control unanticipated costs related to slide mitigation during construction. With these general understanding these are some of the recommendations to avoid.

Geotechnical Recommendations- Because of the magnitude of this project, topographical fluctuations and complexity of the soil and rock formations, significant subsurface exploration and investigations will be needed for this project.

Caltrans will perform horizontal drilling at locations where we anticipate the use of soil nail walls and/or rock bolting. Surface seismic refraction Surface seismic refraction

studies will be done to assess the stability of rock masses as well as define boundaries between different types of rock formations. In case of rocks with discontinuities, joint-surveys will be conducted by Engineering Geologists to arrive at predominant joint orientations. Laboratory tests will be conducted on retrieved soil and rock samples.

The current alternative is a conventional, two-lane highway with 3.6 meters (11.8 ft) median. This has considerably reduced the geotechnical demand on the project. The recommended types of retaining walls are Soil Nail Walls, Soldier Pile Walls, Pier Walls for cut slopes. Caltrans recommends proceeding with the soil nail wall for the cut slopes.

Soil Nail Walls- Soil-nail wall system has been selected *in lieu of* cantilevered retaining walls. However, soil nail wall may not be suitable to be installed in soft clayey soils, loose granular soils, swelling soils, highly fractured rocks with open joints and rock masses with discontinuities that dip towards the excavation face.

Caltrans will be using Soil Nail Walls for some of the high retaining wall within the project area. One of them is about 30.48 m (100 ft) high at Post Mile 1.5 in Solano County along the new proposed widening along Jameson Canyon. Most of the cut walls using Soil Nail Walls are at the west bound direction.

For fill walls Caltrans is using MSE (Mechanically stabilizing Earth) Walls for most east-bound direction of the project. The MSE walls with metallic reinforcing strips or polymeric strips with pre cast facing elements would be a viable option. The recommended maximum design height of a MSE wall is 15 m (50 ft) but since one of the retaining walls is higher than that Caltrans will be building a two-tier wall.

The Interchange Area- Based on limited data from the adjacent project, groundwater may be present at shallow depth. Groundwater levels in the project area could not be assessed since no drilling was performed. Investigations on groundwater levels will be done as part of subsurface investigations during the GDR phase of geotechnical investigations. It should be noted that groundwater conditions are controlled by seasonal changes in rainfall and abnormal weather conditions.

According to the cross sections embankment fills as high as 9 m (30 ft) will need to be constructed over the existing ground at the project site. If conventional fills (imported borrow, structure backfill, etc.) rather than lightweight fills are used, the proposed fills will impose significant pressure on the existing groundwater. During construction, the

groundwater level may rise by about 1 m (3 ft) higher than its seasonal level. However, once the project is completed, it will revert to its seasonal fluctuations.

Because of the proposed significant high embankments, existing high groundwater, and foundation clay material, consolidation settlements are expected. The ground improvement techniques, surcharge, and wick drains may be used to reduce the settlement time significantly. This will be determined during design stage of the project. Because the proposed new interchange will be an elevated structure, the geotechnical concern for the project with respect to hazardous waste generated by excavation will be insignificant.

Preliminary Recommendations and Conclusion-

The relatively flat topography of the site indicates that no significant excavation is anticipated at the site. However, if temporary cuts are required for any reason, we recommend the cuts to be no steeper than 1:1 for up to 3 m (10 ft) high and 1.5:1 for higher cut slopes.

Because of the expected consolidation settlements in this project, the MSE walls are recommended for most of the fill area around the interchange. Based on Caltrans preliminary cost analysis, MSE walls are also most cost effective considering the wall heights fort he proposed project.

2.2.4. HAZARDOUS WASTE/ MATERIALS

Regulatory settings- Hazardous materials and hazardous wastes are regulated by many state and federal laws. These include not only specific statutes governing hazardous waste, but also a variety of laws regulating air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Resource Conservation and Recovery Act of 1976 (RCRA) and the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA). The purpose of CERCLA, often referred to as Superfund, is to clean up contaminated sites so that public health and welfare are not compromised. RCRA provides for “cradle to grave” regulation of hazardous wastes. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act

- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety & Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order 12088, Federal Compliance with Pollution Control, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved. Hazardous waste in California is regulated primarily under the authority of the federal Resource Conservation and Recovery Act of 1976, and the California Health and Safety Code. Other California laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup and emergency planning.

Worker health and safety and public safety are key issues when dealing with hazardous materials that may affect human health and the environment. Proper disposal of hazardous material is vital if it is disturbed during project construction.

Affected Environment - A hazardous waste site investigation was performed by Caltrans that indicates the presence of aerially deposited lead (ADL) along the SR 12 area in Solano and Napa Counties.

Impact – The aerial lead testing for the above-referenced project has been completed. There is aerially deposited lead (ADL) along SR 12 and the interchange area. This conclusion is based on 225 soil samples that were performed within the proposed project footprint. An environmental regulatory database search was also conducted for any known hazardous material sites in the project area. The survey shows no known hazardous material sites that pose a threat to the either alternatives for the project.

No soil samples were reported to contain lead concentrations that exceed the Total Threshold Limit Concentration (TTLC) or Soluble Threshold Limit Concentration (STLC). Based on the statistical analysis, the soil, if treated as a whole, may be considered non-hazardous. However, if the construction work is staged in a manner that segregates the excavated soil, waste soil from some areas may be considered hazardous and should be managed under the Department of Toxic Substance Control (DTSC) guidance. If management of the soil within the varience is required, the statistical data

indicate that the soil may be able to be handled within condition 2 of the variance. This condition requires that the soil be used as fill beneath a pavement structure designated to protect the soil from water infiltration and 1.5 m (5 ft) above the the water table elevation and be protected from infiltration from a protected from a pavement structure. Caltrans would be taking measures to protect the reused soil by implementing Caltrans special provisions for health and safety.

Avoidance, Minimization, and/or Mitigation Measures: No mitigation is currently proposed.

2.2.5. AIR QUALITY

Regulatory Setting - The Clean Air Act as amended in 1990 is the federal law that governs air quality. Its counterpart in California is the California Clean Air Act of 1988. These laws set standards for the quantity of pollutants that can be in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM), lead (Pb), and sulfur dioxide (SO_2). Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve Federal actions to support programs or projects that are not first found to conform to State Implementation Plan for achieving the goals of the Clean Air Act requirements. Conformity with the Clean Air Act takes place on two levels—first, at the regional level and second, at the project level. The proposed project must conform at both levels to be approved.

Regional level conformity in California is concerned with how well the region is meeting the standards set for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), and particulate matter (PM). California is in attainment for the other criteria pollutants. At the regional level, Regional Transportation Plans (RTP) are developed that include all of the transportation projects planned for a region over a period of years, usually at least twenty. Transportation Improvement Program (TIP) is a set of highway and transit projects to be funded over the next three years. Based on the projects included in the RTP and TIP, an air quality model is run to determine whether or not the implementation of those projects would conform to emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If the conformity analysis is successful, the regional planning organization, such as Metropolitan Transportation Commission for the Bay Area and the appropriate federal agencies, such as the Federal

Highway Administration, make the determination that the RTP and TIP are in conformity with the State Implementation Plan for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP must be modified until conformity is attained. If the design and scope of the proposed transportation project are the same as described in the RTP and TIP, then the proposed project is deemed to meet regional conformity requirements for purposes of project-level analysis.

Conformity at the project-level also requires “hot spot” analysis if an area is “nonattainment” or “maintenance” for carbon monoxide (CO) and/or particulate matter. A region is a “nonattainment” area if one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have recently met the standard are called “maintenance” areas. Conformity does include some specific standards for projects that require a hot spot analysis. In general, projects must not cause the CO standard to be violated, and in “nonattainment” areas the project must not cause any increase in the number and severity of violations. If a known CO or particulate matter violation is located in the project vicinity, the project must include measures to reduce or eliminate the existing violation(s) as well.

Affected Environment – The project area is on rolling terrain and surrounded by either open spaces or farms with sparsely spaced residences on either side. This project is located within the San Francisco Bay Area Air Basin, which is characterized by complex terrain consisting of coastal mountain ranges, inland valleys and bays. The project area stretches from the Carquinez Strait region of the air basin to the southern Napa Valley region. The pollution potential is usually moderated in the Carquinez Strait region due to high wind speeds. Air pollution potential is high in the Napa Valley region, especially at the northern portion. Summer and fall prevailing winds can transport locally and non-locally generated ozone precursors northward where the valley narrows, effectively trapping and concentrating the pollutants under stable conditions.

The Bay Area Air Quality Management District (BAAQMD) administers air quality regulations for the San Francisco Bay Area. The CAA requires States to submit a State Implementation Plan (SIP) for area designated as nonattainment for federal air quality standards. Under the Transportation Conformity Rule developed by US EPA and US DOT, most transportation projects, regional transportation plans, and transportation improvement programs, must meet "conformity" requirements in areas that are nonattainment for Federal air quality standards. The Metropolitan Transportation Commission (MTC) is the local Metropolitan Planning Organization (MPO) responsible

for preparing regional transportation plans and demonstrating their conformity with the State Implementation Plan (SIP). Project-level conformity is demonstrated by showing that a project comes from a conforming regional plan and program, with substantially the same "design concept and scope" that was used for the regional conformity analysis; showing that it will not cause localized exceedances of CO, PM_{10} and/or $PM_{2.5}$ standards in nonattainment or maintenance areas for those pollutants; and verifying that it will not interfere with timely implementation of Transportation Control Measures called out in the SIP.

The San Francisco Bay Area Air Basin has not exceeded the national or state CO standards for many years and is now recognized as an attainment area for CO. The Bay Area is currently classified as a marginal nonattainment area under the 8-hour national ozone standard. For PM_{10} and $PM_{2.5,}$ the Bay Area is currently designated as unclassified for the national 24-hour standards. It is in attainment for the $PM_{2.5}$ national annual arithmetic mean standards. It is non-attainment under the state standards for both PM_{10} and $PM_{2.5}$. EPA has released its revisions to the particulate matters (PM_{10} and $PM_{2.5}$) standards in September 2006. Area designations based on the new standards would be finalized in 2009. Table 2.2.5.1 below lists the attainment status for various pollutants under the State and national standards.

TABLE 2.2.5.1 - Ambient Air Quality Standards & Bay Area Attainment Status

Pollutant	AVERAGING TIME	California Standards		National Standards	
		Concentration	Attainment Status	Concentration	Attainment Status
Ozone	8 Hour	0.070 ppm (137µg/m^3)	U	0.08 ppm	N
	1 Hour	0.09 ppm (180 µg/m^3)	N	-	
Carbon Monoxide	8 Hour	9.0 ppm (10 mg/m^3)	A	9 ppm (10 mg/m^3)	A
	1 Hour	20 ppm (23 mg/m^3)	A	35 ppm (40 mg/m^3)	A
Nitrogen Dioxide	Annual Average	-		0.053 ppm (100 µg/m^3)	A
	1 Hour	0.25 ppm (470 µg/m^3)	A	-	
Sulfur Dioxide	Annual Average	-		80 µg/m3 (0.03 ppm^3)	A
	24 Hour	0.04 ppm (105 µg/m^3)	A	0.14 ppm (365 µg/m^3)	A
	1 Hour	0.25 ppm (655 µg/m^3)	A	-	
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N		
	24 Hour	50 µg/m^3	N	150 µg/m^3	U
Particulate Matter - Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	N	15 µg/m^3	A
	24 Hour			35 µg/m^3	U
Sulfates	24 Hour	25 µg/m^3	A		
Lead	Calendar Quarter			1.5 µg/m^3	A
	30 Day Average	1.5 µg/m^3	A	-	
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3	U	-	
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 µg/m^3	No information available	-	
Visibility Reducing particles	8 Hour(1000 to1800 PST)		A	-	
A=Attainment N=Nonattainment U=Unclassified					
mg/m^3=milligrams per cubic meter		ppm=parts per million		µg/m^3=micrograms per cubic meter	
Source: BAAQMD					

BAAQMD maintained monitoring stations collect ambient air quality data around the Bay Area on a continuous basis. Data from the two monitoring stations closest to the project are listed in Table 2.2.5.2.

TABLE 2.2.5.2 – Ambient Air Quality Data

Pollutants	Category	Monitoring Stations					
		Vallejo – Tuolumne St.			Napa-Jefferson Ave.		
		2003	2004	2005	2003	2004	2005
Ozone	1-hr Max. (ppm)	0.101	0.104	0.087	0.105	0.092	0.091
	8-hr Max. (ppm)	0.073	0.069	0.07	0.083	0.072	0.067
CO	1-hr Max. (ppm)	4.0	4.0	3.9	4.7	3.7	3.2
	8-hr Max. (ppm)	2.9	3.4	3.1	2.5	2.0	2.0
PM_{10}	Nat. 24-hr Max. ($\mu g/m^3$)	38.2	50.8	49.4	29.0	---	13.7
	Nat. Annual Avg. ($\mu g/m^3$)	16.8	18.9	16.8	17.7	---	2.4
	State 24-hr Max. ($\mu g/m^3$)	39.0	51.4	52.3	30.8	---	13.7
	State Annual Avg. ($\mu g/m^3$)	17.3	19.6	---	---	---	---
$PM_{2.5}$	Nat. 24-hr Max. ($\mu g/m^3$)	30.8	39.7	43.8	---	---	---
	Nat. Annual Avg. ($\mu g/m^3$)	9.4	11.1	9.7	---	---	---
	State 24-hr Max. ($\mu g/m^3$)	30.8	39.7	43.8	---	---	---
	State Annual Avg. ($\mu g/m^3$)	9.4	11.1	---	---	---	---
"---" no data available Source: Cal EPA, Air Resources Board							

Methodology

a. Carbon Monoxide (CO) Carbon monoxide (CO) is a colorless, odorless, poisonous gas. A product of incomplete burning of hydrocarbon-based fuels, carbon monoxide consists of a carbon atom and an oxygen atom linked together.

This air quality analysis utilizes the "Transportation Project-Level Carbon Monoxide Protocol", dated December 1997, prepared by the Institute of Transportation Studies, University of California at Davis and approved by the EPA for use in the Bay Area. The protocol is based on the fact that the Bay Area meets air quality standards for carbon monoxide and permits a qualitative approach to determine its air quality impacts. Use of this protocol was recommended by the Bay Area Interagency Conformity Task Force, which is the interagency consultation group established pursuant to EPA's conformity regulation and the Bay Area's conformity SIP. This protocol was approved by MTC in

Resolution No. 3075 on June 24, 1998. It was accepted by EPA as an alternative to the quantitative analysis procedure specified in the 1997 Conformity Rule.

Since the Bay Area was designated an attainment area for CO on June 1, 1998, the protocol indicates that an analysis by comparison is appropriate for this project. This involves a comparison of the proposed project with an existing facility within the air district that has the potential of creating higher CO concentrations at the time of attainment demonstration. A list of the features to be compared is contained in Section 4.7.2 of the CO Protocol. As shown in Table 3, conditions on Route 101 from Tully Road to Story Road in San Jose are used for comparison purposes.

TABLE 2.2.5.3 - Comparison of Mainline Conditions

	Parameters	SRs 12/29 - Build Alternatives 1 & 2	Route 101 – Existing Tully Rd to Story Rd
A	Receptor Distance	22m (72')	6.1m (20')
B	Roadway Geometry	4 lanes	8 lanes
C	Worse case Meteorology	Coastal Valley	Coastal Valley
D	AADT Volumes	24,900 (2005) 52,300 (2025)	246,000 (2005)
E	Hot/Cold Starts	10/50 EB 10/50 WB	10/50 NB 10/50 SB
F	Percent HDG trucks	1.8%	2.4%
G	8 Hr. Background CO	2.8 ppm (2005)	5.7 ppm (2005)

The AADT for Route 101 between Tully Road and Story Road represents current traffic volumes as expressed in the Caltrans publications '2005 Traffic Volumes on California State Highways' and "2005 Annual Average Daily Truck Traffic on the California State Highway System." Since all of the above conditions are satisfied, there is no reason to expect higher CO concentrations at the Jameson Canyon project area from the mainline traffic. Although nearby intersections will experience traffic volume increases as a function of this project and anticipated growth in the area, volumes will be well below similar intersections in the Bay Area, and therefore will not cause exceedence of state or federal CO standards.

b. Particulate Matters (PM_{10} and $PM_{2.5}$)

Particulate Matter (PM_{10} and $PM_{2.5}$) refers to airborne particles that are less than 10 microns in diameter (PM_{10}) and less than 2.5 microns in diameter ($PM_{2.5}$). Transportation related particulate matter is both a regional and project-level issue. The coarser particulate matters, PM_{10}, are typically formed by earth-based material that enter the air through a variety of actions including "entrainment" into the atmosphere by wind blown dust. Particles from brake and tire wear, from pavement wear, and from other vehicle degenerative processes also contribute to this PM size. However, the greatest contribution from this size category has "natural" rather than "man-made" origins. $PM_{2.5}$ are thought to be more a product of combustion sources. This material is believed to penetrate deeper into the lungs and remain lodged there rather than exhaled, causing negative impacts on health.

The U. S. EPA issued a final conformity rule on March 10, 2006 that establishes the transportation conformity criteria and procedures for determining which transportation projects must be analyzed for local air quality impacts in $PM_{2.5}$ and PM_{10}. Since the San Francisco Bay Area is either in the attainment or unclassified status for the national PM_{10} and $PM_{2.5}$ standards, there is no need to perform particulate matters hot-spot analyses at the project level. The Bay Area is non-attainment for the State PM_{10} and $PM_{2.5}$ standards.

c. Mobile Source Air Toxics (MSATs)

In addition to the criteria air pollutants for which there are National Ambient Air Quality Standards (NAAQS), EPA also regulates air toxics.
Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. The EPA has identified six priority transportation toxics. They are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.

The EPA is the lead Federal Agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. The EPA issued a Final Rule on Controlling Emissions of Hazardous Air Pollutants from Mobile Sources, 66 FR 17229 (March 29, 2001). This rule was issued under the authority in Section 202 of the Clean Air Act. In its rule, EPA examined the impacts of existing and newly promulgated mobile source control programs, including its reformulated gasoline (RFG) program, its national low emission vehicle (NLEV) standards, its Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and its proposed heavy duty engine and vehicle standards and on-highway diesel fuel sulfur control requirements. Between 2000 and 2020, FHWA projects that even with a 64 percent increase in VMT, these programs will reduce on-highway emissions of benzene, formaldehyde, 1,3-butadiene, and acetaldehyde by 57 percent to 65 percent, and will reduce on-highway diesel PM emissions by 87 percent. As a result, EPA concluded that no further motor vehicle emissions standards or fuel standards were necessary to further control MSATs. The agency is preparing another rule under authority of CAA Section 202(l) that will address these issues and could make adjustments to the full twenty-one and the primary six MSATs.

Evaluating the environmental and health impacts from MSATs on a proposed highway project involves several key elements. Including emissions modeling, dispersion modeling in order to estimate ambient concentrations resulting from the estimated emissions, exposure modeling in order to estimate human exposure to the estimated concentrations, and then final determination of health impacts based on the estimated exposure. Each of these steps is encumbered by technical shortcomings or uncertain science that prevents a more complete determination of the MSAT health impacts of this project.

Exposure to toxics has been a focus of a number of EPA efforts. Most notably, the agency conducted the National Air Toxics Assessment (NATA) in 1996 to evaluate modeled estimates of human exposure applicable to the county level. While not intended for use as a measure of or benchmark for local exposure, the modeled estimates in the NATA database best illustrate the levels of various toxics when aggregated to a national or State level.

The EPA is in the process of assessing the risks of various kinds of exposures to these pollutants. The EPA Integrated Risk Information System (IRIS) is a database of human health effects that may result from exposure to various substances found in the environment. The IRIS database is located at http://www.epa.gov/iris.

There have been other studies that address MSAT health impacts in proximity to roadways. The Health Effects Institute, a non-profit organization funded by EPA, FHWA, and industry, has undertaken a major series of studies to research near-roadway MSAT hot spots, the health implications of the entire mix of mobile source pollutants, and other topics. The final summary of the series is not expected for several years.

In summary, when a highway is widened and, as a result, moves closer to receptors (residences, business buildings), the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative. This could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). Also, MSATs will be lower in other locations when traffic shifts away from them. However, on a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today. Construction activity may generate a temporary increase in MSAT emissions. Construction mitigation includes strategies that reduce engine activity or reduce emissions per unit of operating time. The EPA has listed a number of approved diesel retrofit technologies; many of these can be deployed as emissions mitigation measures for equipment used in construction.

d. Conformity with State Implementation Plan (SIP)

The current Regional Transportation Plan for the Bay Area, known as *Transportation 2030*, was adopted by MTC on Feb. 23, 2005. The 2007 TIP is the most current conforming TIP, which was adopted by MTC on July 26, 2006 and approved by the Federal Transit Administration (FTA), and the Federal Highway Administration (FHWA) on October 2, 2006. The TIP conformity determination was made under the motor vehicles emissions budget contained in the 2001 1-Hour Ozone Attainment Plan for the ozone precursors and the 1996 Carbon Monoxide Maintenance Plan (and 1998 Revisions). The status of Transportation Control Measures (TCMs) A through E from the 2001 Ozone Attainment Plan was also reviewed to demonstrate their timely implementation. This conformity finding puts the nine-county region in conformity with SIP and all transportation-related federal air quality requirements.

Impacts:

Carbon Monoxide- This project would result in a facility that will be smaller and less congested than comparable facilities within the same Air District. Since the comparable facilities are in an area that meets air quality standards (maintenance area), this project will also meet microscale air quality requirements and will therefore have no significant impact on air quality or cause exceedances of state or federal CO standards.

Particulate Matter- Qualitatively, we expect that this project will not have an adverse effects on microscale particulate levels since actual non-truck vehicle emissions of particulates are believed to be small, and the number of heavy duty diesel trucks using the facility will not be increased significantly as a result of the project. While the Bay Area does list yearly exceedences of the State particulates standards, the closest monitoring stations show minimal problems. At the Vallejo-Tuolumne Street monitoring station, there was only one exceedence of the State 24-hour PM_{10} standard each year for 2004 and 2005 and none in 2003. There is no exceedence from 2003 to 2005 at the Napa-Jefferson Avenue station. For the State annual mean $PM_{2.5}$ standard, there is no exceedence at the Vallejo-Tuolumne Street from 2003 to 2005. The levels in the project area are expected to be substantially lower than at these monitoring stations.

Mobile Source Air Toxics **-** This report includes a basic analysis of the likely MSAT emission impacts of this project. However, available technical tools do not enable us to predict the project-specific health impacts of the emission changes associated with the alternatives in this study. Due to these limitations, the following discussion is included in accordance with CEQ regulations (40 CFR 1502.22(b)) regarding incomplete or unavailable information:

> Some recent studies have reported that proximity to roadways is related to adverse health outcomes—particularly respiratory problems. Much of this research is not specific to MSATs, instead surveying the full spectrum of both criteria and other pollutants. The FHWA cannot evaluate the validity of these studies, but more importantly, they do not provide information that would be useful to alleviate the uncertainties listed above and enable us to perform a more comprehensive evaluation of the health impacts specific to this project.

Because of the uncertainties outlined above, a quantitative assessment of the effects of air toxic emissions impacts on human health cannot be made at the project level. The available tools do allow us to reasonably predict relative emissions changes between

alternatives for larger projects. The amount of MSAT emissions from each of the project alternatives and MSAT concentrations or exposures created by each of the project alternatives cannot be predicted with enough accuracy to be useful in estimating health impacts. As noted above, the current emissions model is not capable of serving as a meaningful emissions analysis tool for smaller projects. Therefore, the relevance of the unavailable or incomplete information is that it is not possible to make a determination of whether any of the alternatives would have "significant adverse impacts on the human environment."

Under the FHWA's Interim Guidance on Air Toxic Analysis in NEPA Documents issued on February 3, 2006, this project is considered of having low potential Mobile Source Air Toxics (MSATs) effects.

For each alternative in this study, the amount of MSAT emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for each of the Build Alternatives is slightly higher than that for the No Build Alternative, because the additional capacity increases the efficiency of the roadway and attracts rerouted trips from elsewhere in the transportation network. This increase in VMT would lead to higher MSAT emissions for the action alternative along the highway corridor, along with a corresponding decrease in MSAT emissions along the parallel routes.

The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds; according to EPA's MOBILE6 emissions model, emissions of all of the priority MSATs except for diesel particulate matter decrease as speed increases. The extent to which these speed-related emissions decreases will offset VMT-related emissions increases cannot be reliably projected due to the inherent deficiencies of technical models.

Because the estimated VMT under each of the Alternatives are relatively close to each other, it is expected there would be no appreciable difference in overall MSAT emissions among the various alternatives. Also, regardless of the alternative chosen, emissions will likely be lower than present levels in the design year as a result of EPA's national control programs that are projected to reduce MSAT emissions by 57 to 87 % between 2000 and 2020. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of

the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes and connector ramps contemplated as part of the project alternatives will have the effect of moving some traffic closer to nearby homes. Therefore, under each alternative there may be localized areas where ambient concentrations of MSATs could be higher under the Build Alternatives than the No Build Alternative. However, as discussed above, the magnitude and the duration of these potential increases compared to the No-build alternative cannot be accurately quantified due to the inherent deficiencies of current models.

Conformity with the State Implementation Plan- This project is included in the conforming 2007 TIP and the *Transportation 2030*. The design concept and scope of the project are consistent with the design concept and scope in the RTP and TIP listings. Neither Build alternative of the project would delay or interfere with the timely implementation of any TCMs in the Bay Area. The proposed project is determined to be in conformity with the SIP in the project level.

Construction Impacts-The proposed project would generate air pollutants during construction. Trucks and construction equipment emit hydrocarbons, oxides of nitrogen, carbon monoxide and particulates. Most pollution will consist of wind-blown dust generated by excavation, grading, hauling and various other activities. The impacts from the above activities would vary from day to day as construction progresses. The Special Provisions and Standard Specifications will include requirements to minimize or eliminate dust through the application of water or dust palliatives.

Recent studies have raised significant concerns about the health risks associated with emissions from diesel construction equipment. For PM_{10}, $PM_{2.5}$ or air toxics, there currently are no microscale requirements that are applicable at the project level for the temporary impacts in the construction phase.

The California Air Resources Board through its Diesel Risk Reduction Program has implemented, and will implement additional control measures that affect the construction phase of the project and, as regulations, are implemented through Standard Specifications 7-1.01F. These include: truck idling limitations, stationary and portable engine emission control programs, accelerated low-sulfur fuel availability, public vehicle fleet accelerated retrofit and replacement regulations, (pending) private truck fleet regulations, and (pending) off-road equipment fleet accelerated retrofit and replacement regulations. This

program will provide reduction of risks to public health through the reduction of construction and operational emissions.

Avoidance, Minimization, and/or Mitigation Measures: No project-level mitigation is currently proposed.

2.2.6. NOISE

Regulatory Setting- The National Environmental Policy Act (NEPA) of 1969 and the California Environmental Quality Act (CEQA) provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

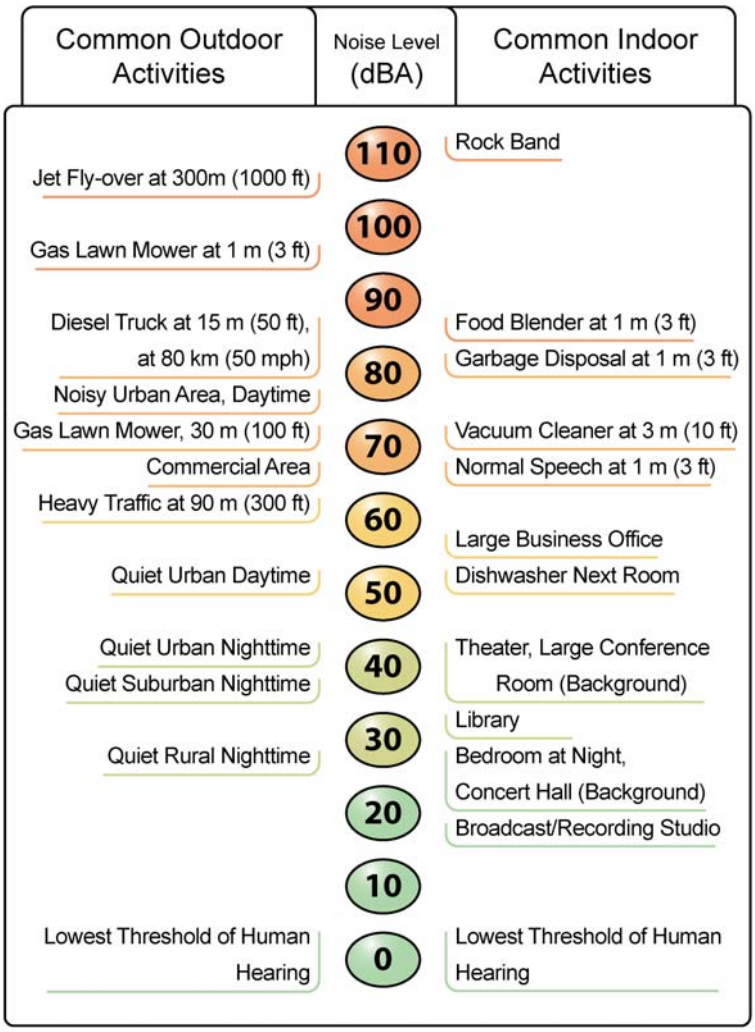
California Environmental Quality Act (CEQA)- CEQA requires a strictly no-build versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

National Environmental Policy Act and 23 CFR 772- For highway transportation projects with FHWA involvement, the Federal-Aid Highway Act of 1970 and the associated implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations contain noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the NEPA-23 CFR 772 analysis.

Table 2.2.6.1 FHWA's Noise Abatement Criteria (NAC)

Activity Category	**NAC, Hourly A- Weighted Noise Level, dBA L_{eq}(h)**	***Description of Activities***
A	57 Exterior	*Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose*
B	67 Exterior	*Picnic areas, recreation areas, playgrounds, active sport areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.*
C	72 Exterior	*Developed lands, properties, or activities not included in Categories A or B above*
D	--	*Undeveloped lands.*
E	*52 Interior*	*Residence, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums*

This table below lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise-levels discussed in this section with common activities.



In accordance with FHWA's Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects (TNAP), August, 2006, a noise impact occurs when the future noise level with the project results in a substantial increase in noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans

and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Department's *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5-dBA reduction in the future noise level must be achieved for an abatement measure to be considered feasible. Other considerations include topography, access requirements, other noise sources and safety considerations. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents acceptance, the absolute noise level, build versus existing noise, environmental impacts of abatement, public and local agencies input, newly constructed development versus development pre-dating 1978 and the cost per benefited residence.

Affected Environment - This Noise Study addresses the traffic noise impacts in the project area for the proposed four-lane highway project on SR 12 from the SRs 29/12 Interchange in Napa County to Red Top Road in Solano County. The analysis for this project considered, among other things, land use activities, existing noise levels, future predicted noise levels under the "No Build" Alternative, Build Alternatives (1 & 2), and possible abatement measures, where *feasible* and *reasonable*.

The existing facility currently operates at full capacity. The current annual average daily traffic (AADT) for SR 12 at this location is approximately 30,000 vehicles. The AADT on this facility is expected to increase to a projected demand of over 60,000 vehicles by the year 2035. The current peak hour volume is 1500 vehicles per direction. By year 2035, the peak period volume is expected to increase to 4000 vehicles per direction.

Land uses along SR 12 in the project area are mostly residential, open space and commercial. At the SRs 29/12 interchange, there are some commercial buildings in the northeast quadrant. The other three quadrants are open space areas. Sensitive noise receptors considered for this study are the residences along SR 12 within the project limits, as well as outdoor areas intended for frequent human use. There are no sensitive noise receptors at the SRs 29/12 interchange. Activity Category B of the NAC in Table 2.2.6.1 applies to the residences within this project.

Methodology- Noise is defined as unwanted sound. A number of factors affect sound perceived by the human ear, including the level of sound, the frequencies involved, the

period of exposure, and the changes or fluctuations in the noise levels during exposure. Levels of sound are measured in terms of decibels (dB). Since the human ear cannot perceive all frequencies equally well, measured sound levels are often adjusted, or weighted, to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA. All references to sound level in this report refer to A-weighted decibels.

For calculation of the highest existing and future noise levels, computer modeling was performed using the FHWA approved Traffic Noise Model (TNM) Version 2.5, which considers factors such as roadway configuration, gradient, traffic volumes, vehicle types, speed, terrain, shielding, and types of ground surface. TNM was also used in evaluating the effectiveness of sound wall proposals where impacted receptors were identified.

Impact- Noise impact is assessed for the outdoor area of a particular residence where the exposure to highway noise is the greatest, usually in its front or back yard. Some of the residential receptors in the project area have no usable yards on the highway side, as they are built on sloping terrain. Twenty-four hour measurements conducted on two different days showed that noise levels usually peaked in the morning hours.

The measurement sites, which are the same as most receptors in the project area, are sparsely located on both sides of SR 12. The analysis indicates there are two residences (receptors R6 and R9) that presently have noise levels higher than 66 dBA Leq (h) (see Table 2.2.6.2) in the yards facing the highway.

Noise measurements were taken in July of 2006 to determine the existing noise levels throughout the project area. At several locations, A Type II sound level meter, Metrosonics Model db-3100 Noise Monitor, was used to record the hourly average sound levels continuously for a 24 hour period. Traffic volumes were counted manually, concurrently with the measurements, for computer model calibration purpose.

For the purpose of noise studies, the vehicles on the freeways are classified as either automobile, medium truck or heavy truck. Percentages for the three types of vehicle, based on "2003 Annual Average Daily Truck Traffic on the California State Highway System", are 92.3%, 2.8% and 4.9% of the total volume, respectively.

Traffic noise impacts at sensitive receptors occur when future predicted noise levels with the project in place either 1) show a *substantial* increase (12 dBA or higher) from the existing levels, or 2) approach or exceed the NAC established by the FHWA, as listed in Table 2.2.6.1. The term 'approach' is defined by Caltrans as one dBA below the criterion.

For example, a residence with predicted future exterior noise levels of 66 dBA Leq (h) or higher would qualify for consideration of noise abatement. Noise abatement or mitigation measures must be considered for Type 1 projects when a noise impact is identified.

No-Build Alternative- Since the current traffic on SR 12 operates at full capacity, no increase in noise is anticipated in the future under the No-Build Alternative, provided the highway configuration remains unchanged. The future noise levels at the 2 residences (receptors R6 and R9) on SR 12 would exceed 66-dBA Leq (h) and, therefore, are deemed impacted by traffic noise.

Build Alternatives- Under the Build alternatives, there would be two lanes of traffic in the eastbound direction and two lanes of traffic in the westbound direction for SR 12. For residences on SR 12, future noise (see Table 2.2.6.2.) would increase from their existing levels, due to the added traffic volume and the decrease in distance to the traffic. The increases would be less than 3 dBA, which is barely perceptible to the average human ear. A total of four residences (receptors R3, R5, R6, and R9) are deemed affected by traffic noise, when the predicted future noise levels exceed 66 dBA Leq (h). The affected residential receptors all have direct line of sight of the highway. There would be no noise impacts for the SRs 29/12 interchange since there are no sensitive noise receptors.

There would be no *substantial* (12 dBA or more) noise increases for any receptors in the project area for the No-Build and Build Alternative.

A 4.20 m (13.1 ft) high, 145 m (475 ft) long sound wall along the edge of shoulder of westbound could reduce noise for receptor No. 9, a house on SR 12 at 5000 Jameson Canyon Road, by 5 dBA. The sound wall would be effective for an area that measures 145 meters (475 ft) along the frontage of the highway. It would break the line of sight from a truck stack to the receptor. Heights of sound wall are measured from the elevation at the edge of shoulder. Based on guidelines from Caltrans TNAP, the reasonable allowance for this sound wall is determined to be $34,000 (see Appendix C). Based on the unit price of sound wall at $250/sq.m, the estimate cost for this barrier will be about $150,000.

Table 2.2.6.2 shows the measured and the existing highest hourly noise levels at representative receptors. These receptors are located where the highest noise levels are most likely to appear in their immediate areas.

Table 2.2.6.2 shows the existing and future predicted noise levels under the No-Build, and Build Alternative, either with or without the sound wall in consideration.

Table 2.2.6.2

Receiver I.D No. #	Type, Address[2]	Approx. # of Receptors	Offset Distance to Centerline (m)	Existing Noise Levels Leq(h)[3], dBA		Predicted Noise Levels Leq(h), dBA year2035		Heights of Barrier (wall)				Benefitted Receiver Cost
				Measured	Calculated	No Build	Build	3.0 m (10 ft)	3.6 m (12 ft)	4.2 m (14 ft)	4.9 m (16 ft)	
R1	SFR,134 JCR	1	83	-	61	62	62	N/A	N/A	N/A	N/A	N/A
R2	SFR,136 JCR	1	112	-	59	59	60	N/A	N/A	N/A	N/A	N/A
R3	SFR, 679 JCR	1	26	65	66	66	71	67	67	67	67	N/A
R4	SFR, 3875 JCR	1	62	-	62	62	65	64	64	64	64	N/A
R5	SFR, 3875 JCR	1	44	-	64	65	67	64	64	64	64	N/A
R6	SFR, 682 JCR	1	35	-	70	70	70	69	69	69	68	N/A
R7	SFR,685 JCR	1	65	-	62	63	65	N/A	N/A	N/A	N/A	N/A
R8	SFR, 686 JCR	1	63	-	62	62	65	N/A	N/A	N/A	N/A	N/A
R9	SFR,5000 JCR	1	40	-	67	67	69	64	64	64	64	N/A
R10	SFR, 3531 ST	1	100	59	60	60	61	N/A	N/A	N/A	N/A	N/A
R11	SFR, 1394 JCR	1	106	-	58	59	61	N/A	N/A	N/A	N/A	N/A
R12	SFR, 1394 JCR	1	94	-	60	60	61	N/A	N/A	N/A	N/A	N/A
R13	SFR, 1646 JCR	1	57	-	62	64	65	N/A	N/A	N/A	N/A	N/A
R14	SFR, 1687 JCR	1	71	-	62	63	64	N/A	N/A	N/A	N/A	N/A

Notes:

1. SFR - Single family residence.
2. JCR - Jameson Canyon Road. ST - Spurs Trail.
3. Leq(h) are A - weighted hourly noise in decibels.

Noise Abatements Considered- Noise abatement in the form of sound walls has been investigated for all affected receptors. Only those sound walls that are determined feasible and reasonable will be considered further for construction. Where feasible, noise barriers can be designed as sound walls, earth berms, or a combination of both and still provide comparable results, as long as their heights and locations are identical.

Noise Receptors 1

Noise Receptors 2

Noise Receptors 3

Noise Receptors 4

Noise Receptors 5

Noise Receptors 6

Feasibility- Only those noise abatement measures that are feasible and reasonable are considered candidates for construction. For the noise abatement measures to be considered feasible, a minimum of 5-dBA-noise reduction must be achieved at the affected receptors. Feasibility also refers to engineering issues regarding the overall constructability, such as safety, topography, soil, drainage, and local access requirements.

The feasibility of the abatement measures being considered is determined by noise analysis and subsequent engineering studies.

Preliminary Reasonableness analysis involves the consideration of the cost of abatement, absolute noise levels, the date of development of the impacted residences, and the life cycle of the abatement. These factors are addressed by calculating the "reasonable allowance" per benefited residence using methodology outlined in the TNAP. If the estimated cost of the noise abatement measure under consideration is less than or equal to the calculated reasonable allowance, the measure is deemed *preliminarily* reasonable.

Final Reasonableness- All feasible noise abatement measures are further evaluated in the *final reasonableness* determination, which is subjective in that common sense and good judgment are exercised to arrive at a decision. The decision is based on, but not limited to, all factors in the preliminary reasonableness decision and the following considerations:

• Secondary environmental impacts of the abatement
• Views (opinions) of the impacted residents
• Input from public and local agencies
• Other social, economic, environmental, legal and technological factors

Views of the affected residents will be a major consideration in reaching a final decision on the reasonableness of abatement measures to be provided. The final abatement decision will be reflected in the Final Environmental Document. If the reported abatement design changes after approval of the Final Environmental Document, a technical reevaluation may be necessary.

Avoidance, Minimization, and/or Mitigation Measures- None of the receptors within the project limits would have a 12 dBA or more increase in its future predicted noise levels as a result of any of the proposed Build Alternatives. Therefore, the project causes no significant noise increases and no noise mitigation will be necessary. Under CEQA,

the project-generated noise increase would not cause a significant adverse environmental effect and the proposed noise abatements are not expected to have a significant effect on a competing resource.

Under certain conditions noise *mitigation* is required. When a traffic noise impact is due to a *substantial* noise increase (12 dBA or more) resulting from project generated traffic, and the context and intensity of the increase is determined to be a significant adverse environmental affect due to traffic noise, then noise *mitigation* measures sufficient to eliminate the significant adverse environmental affect are required for project approval.

Undeveloped Lands- When traffic noise impacts are predicted for undeveloped lands for which a noise-sensitive development has received final approval from local jurisdiction before the date of public knowledge of the transportation project, noise abatement must be considered as part of the transportation project. Otherwise, noise abatements should be the responsibility of local agencies or private developers. The issuance of a building permit is generally considered to be the final approval of a development. The date of public knowledge shall be the date of approval of the final environmental decision document (e.g., a Finding of No Significant Impact or a Record of Decision).

Reasonableness Determination-The *preliminary reasonableness* of each sound wall will be determined individually by comparing its reasonable allowance with the estimated construction costs, when they become available. The *final reasonableness* decision will be made upon completion of the public involvement process and the project design.

The exact dimensions and locations of above sound walls are to be determined in final design. If project conditions are substantially changed during final design, these sound walls will be subject to re-evaluation. A final decision of the construction of the noise abatements will be made upon completion of the project design.

Sound Walls Not Feasible- TNM analyses show that, for residences situated right next to driveway entrances (receptors R3, R5, and R6), no sound walls within the State right-of-way could possibly reduce the noise levels by at least 5 dBA, the minimum amount required to be considered feasible. No abatement will be recommended for these three affected residences under the Build Alternative.

Construction Noise- Noise generated while constructing the road widening project could at times reach levels higher then the existing traffic noise. The impact from construction activities would be temporary and can be reasonably minimized by implementing

provisions in Section 7-1.01I, "Sound Control Requirements" of the Caltrans Standard Specifications and the following measures:

- Avoid construction activities during nighttime and weekends, when possible.
- Consider constructing noise barriers as first items of work, where feasible.
- Use of stockpiled dirt as earth berms, where feasible.
- Erect temporary noise barriers, if necessary.
- Keep noisy equipment and haul roads away from sensitive receptors, where feasible.
- Keep the community informed of upcoming especially noisy construction activities and establish a field office to handle noise complaints.

2.2.7. ENERGY

Regulatory Settings- The California Environmental Quality Act Guidelines, Appendix F, Energy Conservation, require environmental documents to include a discussion of the potential energy impacts of proposed projects, with a particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy. The National Environmental Policy Act (42 USC Part 4332) requires the identification of all potentially significant impacts to the environment, including energy impacts.

Affected Environment- Transportation-related activities account for a substantial portion of the petroleum fuels used in California. We expect that transportation-related activities will continue to account for a substantial portion of the petroleum fuels used in California for many more years until there is a major transition to motor vehicles using other technologies and fuels. Until this future time, petroleum fuels must be used efficiently and conservatively because of the environmental impacts of their conversion to propel motor vehicles, construct transportation facilities, and operate and maintain transportation facilities and motor vehicles. There are also important political and environmental costs associated with extracting and refining petroleum fuels.

Impacts

Direct Energy

Direct energy is the energy expended to propel motor vehicles. Direct energy expenditures are dependent on many factors that relate either to motor vehicles or to the facility and traffic operations over which the motor vehicles travel. In general, if the fleet and mix of motor vehicle were similar, direct energy expenditures will be higher for the facility or alternative with:

1. higher traffic volumes, or
2. greater length, or
3. slower speeds (in the range 5 to 55 mph in urban settings or 5 to 35 mph in rural settings), or
4. more congested flow conditions, or
5. poorer levels of service, or
6. greater delay and travel times, or
7. longer queues, or
8. steeper grades

For the proposed project, we expect the total amount of direct energy expenditures resulting from the two Build alternatives to be similar. Both Build alternatives will have similar traffic volumes over the morning and evening peak periods, on a daily basis, on an annual basis, and over the twenty-year period following the construction of the project. Both Build alternatives will be approximately the same length. And both Build alternatives are expected to have similar traffic operations—as concluded in the *OPERATIONAL ANALYSIS FOR THE SR-12 WIDENING PROJECT & ROUTE 12/29 INTERCHANGE* for the Year 2035—on the mainline of SR 12, at connector ramps, and at the SRs 12/29 interchange.

We project each of the Build alternatives will result in less direct energy expenditures in comparison to the No-Build alternative. The energy savings would result from improved traffic operations (levels of service, speeds, flow conditions) for each of the Build alternatives in comparison to the No-Build alternative.

Indirect Energy- Indirect energy is the energy that is expended in the construction, operation, and maintenance of the highway facility, and the manufacture, maintenance, and replacement of parts of the motor vehicles that use the highway facility. In general, the indirect energy expenditures amounting from facility operation and maintenance and from vehicle manufacture, maintenance, and replacement of parts will be similar in magnitude for the alternatives of most projects. Construction energy expenditures will, however, vary with the proposed type of construction and will always be more for Build alternatives than No-Build alternatives.

Table 2.2.7.1

Type of Construction	Energy Factor (Btu per 1977$)
new rural freeway	$6.92x10^4$
new rural highway	$6.60x10^4$
widen rural freeway	$4.32x10^4$
widen rural highway	$4.65x10^4$
new urban freeway	$2.75x10^4$
new urban highway	$2.51x10^4$
widen urban freeway	$2.46x10^4$
widen urban highway	$2.33x10^4$
interchange	$7.01x10^4$
steel girder structure	$3.04x10^4$
concrete girder structure	$2.81x10^4$

Source: California Business, Transportation, and Housing Agency, Department of Transportation, Transportation Laboratory, Energy and Transportation Systems, by D. Talaga, J. Palen, M. Hatano, E. C. Shirley, July 1983, Table C:20, Page C-49.

The amount of energy to be used in the construction of the facilities in each of the Build alternatives of the proposed project will be more substantial than typical roadway projects. This is because the two Build alternatives require the hauling of material for cuts and fills, the construction of concrete retaining walls, and the construction of structures (bridges and connectors) for the SRs 29/12 interchange. The hauling of material for grading of the facility and for the formation of concrete retaining walls and bridges will be very energy intensive.

Total Energy Expenditures- Total energy expenditures are the sum of direct and indirect energy expenditures. For the proposed project, we only performed qualitative assessments of the direct and indirect energy expenditures. It is currently difficult to quantify future direct energy expenditures because: we are in a period in which many types of fuel are being tried for motor vehicle propulsion; the mix of vehicles (passenger cars, SUVs, crossover vehicles, light trucks, heavy trucks) on the roads may fluctuate substantially according to future economic and political trends; and motor vehicle fuel economy standards and efficiency have become stagnant, particularly for American made vehicles, but could begin to increase again. Indirect energy expenditures are also difficult

to quantify at this time because construction methodology and equipment are evolving from the methodologies and equipment that were predominant in the 1960s and 1970s; consequently, our construction energy factors for quantifying construction energy expenditures need to be updated.

Cumulative Impacts- Together with other transportation and non-transportation projects that are proposed for Napa and Solano counties, the proposed Jameson Canyon project will result in an increase in the use of energy resources and the conversion of more petroleum and fossil fuels. This impact is unavoidable and is a concern because of the impact that the conversion of petroleum and fossil fuels has upon the atmosphere and environment. The mitigation of this problem needs to be accomplished at the regional, national and worldwide levels.

Secondary and Indirect Impacts- The proposed Jameson Canyon project may result in increased motor vehicle travel and direct energy/petroleum fuel expenditures. Increased motor vehicle travel and direct energy/petroleum fuel expenditures may, in turn, affect availability and prices for petroleum fuels, but are unlikely to have other substantial secondary or indirect energy impacts.

The Build alternatives will likely result in less direct energy expenditures in comparison to the No-Build alternative. The energy savings would result from improved traffic operations (levels of service, speeds, flow conditions) for each of the Build alternatives in comparison to the No-Build alternative.

Assuming that there are financial reasons to use energy efficiently or conservatively for the construction, operation, and maintenance of the proposed facilities, and the manufacture of motor vehicles that will use the proposed facilities, the Build alternatives are unlikely to result in wasteful indirect energy expenditures.

For these reasons, the proposed project is not expected to have a substantial or significant energy impacts.

2.3. Biological Environment

This section of the environmental document addresses the concerns surrounding plant and animal species, special-status species, regulated habitats and wetlands and Waters of the U. S. as they relate to the proposed project. This project may affect the federally, listed as, threatened California red-legged frog (CRLF; *Rana aurora draytonii*) and three

vernal pool large branchiopod species including the endangered Conservancy fairy shrimp (CFS; *Branchinecta conservatio*), threatened vernal pool fairy shrimp (*Branchinecta lynchi*) and endangered vernal pool tadpole shrimp. Additionally, the project may affect the California state, listed as, threatened Swainson's hawk (*Buteo swainsonii*), and an additional fifteen California Department of Fish and Game (CDFG) amphibian, reptile, bird, and mammal species of special concern that may occur in the project area. The proposed project would affect oak woodlands, riparian forests, wetlands, and other waters occurring within the area.

All permanent and temporary affected areas and values provided in this analysis are based upon preliminary design data. Depending on whether the preferred final interchange build alternative is a Tight Diamond or Single Point configuration, permanent impacts include the potential loss of between 0.59 and 0.61 hectares (ha) [1.46-1.50 acres (ac)] of Coast Live Oak Woodland; 2.86-2.86 ha (7.07 – 7.06 ac) of Coast Live Oak – Willow Riparian Forest; 1.53-1.66 ha (3.77-4.10 ac) of unverified or potential wetlands; 0.19-0.20 ha (0.46-0.50 ac) of possible other waters. Permanent impacts also include the estimated loss of approximately 594 trees.

An unknown number of trees could be removed within the temporary work area to allow movement of equipment and access to work areas. The final total number of trees that will be removed will be quantified during construction and this number of affected trees will be incorporated into the tree mitigation plan to be replanted onsite or in an approved offsite location. will be quantified during construction due to access issues related to permits to enter.

Permits expected for this project include a CDFG Section 1602 Lake and Streambed Alteration Agreement; a Clean Water Act (CWA) Section 404 Individual Permit from the U.S. Army Corps of Engineers (USACE); a CWA Section 401 Water Quality Certification permit from the Regional Water Quality Control Board (RWQCB); and a Biological Opinion with a Section 7 incidental take permit from the U.S. Fish and Wildlife Service (USFWS).

Caltrans will preferentially implement onsite mitigation for temporary impacts to natural communities, as these impacts are identified in later stages of project design.

Caltrans is in the process of identifying mitigation sites for the implementation of onsite mitigation for permanent impacts to oak woodland, riparian forest, and wetland habitats.

Where onsite mitigation is unavailable or infeasible, Caltrans will seek nearby offsite mitigation for permanent loss of habitats through the purchase of appropriate habitat or mitigation bank credits. Caltrans may participate in the preservation and restoration effort of at least 1.5 hectares (3.8 ac) to compensate for impacts to wetlands and other waters of the U. S. and 57.87 ha (143.00 ac) for impacts to CRLF breeding and movement/aestivation habitat, pending approval of the participating agencies. Additional preservation and restoration of vernal pool habitat may be necessary to compensate for impacts to federally-listed large branchiopods. Caltrans will mitigate for the loss of at least 549 native trees by restoring oak woodland and riparian woodland. Locations of tree replacement plantings will be established at on- and off-site locations to be determined by Caltrans and the regulatory agencies.

2.3.1 Natural Communities:

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

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

Affected Environment- Topography in the project biological study area (BSA) is characterized by gradual, west-facing slopes of the Napa River Basin in the west portion of the project and steeper north- and south-facing slopes of Jameson Canyon in the east portion (See Figure 2.3.1.1, Biological Study Area).

From the SR 29/12 interchange, SR12 runs east then bends to the southeast and elevates to run along the north side of the canyon. At the Solano County line, (1.5 mi) southwest of Elkhorn Peak [405 m (1,330 ft)], SR 12 transitions from the Napa River watershed to the Suisun Marsh watershed and begins a gradual descent as it bends back to the east. The road grade descends more steeply as the Canyon opens onto the Suisun Basin and connects with Interstate 80.

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Within the project BSA, several creek crossings occur. North of the interchange, SR 29 spans a perennial reach of Sheehy Creek at. Looking east from the interchange, SR 12 spans a perennial reach of Fagan Creek, and numerous ephemeral tributaries to Fagan Creek. SR 12 also crosses ephemeral tributaries to the unnamed creek (referred to unofficially in some literature as Jameson Canyon Creek) in Solano County.

Appendixes G and H summarizes the plant and animal species observed in the project BSA during field surveys. These lists are a compilation of species observed during field surveys and site visits in 2005 and 2006, as well as from project-specific field notes prior to 2004.

Land cover in the project BSA is annual grassland and ruderal, developed area, agricultural lands, coast live oak-willow riparian forest, alkali grassland, wetlands, waters, landscaped vegetation, and coast live oak woodland. A water treatment facility is a unique land cover category that provides low quality CRLF breeding habitat.

Seven vegetation community types occur within the project BSA. They are

1) annual grassland; and ruderal
2) coast live oak-willow riparian forest;
3) coast live oak woodland;
4) wetlands and waters;
5) alkali grassland;
6) landscaped vegetation; and
7) agriculture lands

The primary wildlife habitats corresponding to these vegetation type communities are discussed here also. However, the vegetation types are defined by species composition while the corresponding wildlife habitats also include other physical environmental characteristics that provide shelter or other resources. Animals are mobile and may move from one vegetation type to another as required to meet feeding, breeding, nesting, and other life-cycle needs. Descriptions of each vegetation community type within the project area along with their corresponding wildlife habitats are described below.

1) Annual Grassland and Ruderal

California annual grassland is the most common community type, occupying approximately 52.4 percent of the project BSA. Dominant plant species within this type include non-native annuals including Italian ryegrass (*Lolium multiflorum)*, Italian thistle (*Carduus pycnocephalus)*, wild oats (*Avena barbata*), and soft cheat and ripgut grass

(*Bromus hordeaceous* and *B. diandrus*). On the south-facing slopes of Jameson Canyon, black mustard (*Brassica nigra*), and fennel (*Foeniculum vulgare*), are locally common. Three native perennial grasses, purple needlegrass (*Nassella pulchra*), California oatgrass (*Danthonia californica*), and alkali rye (*Leymus triticoides*) are occasionally distributed, of which alkali rye is the most prevalent.

The term ruderal is used to describe plant species that occur in weedy, disturbed areas that are typically dominated by non-native annual or perennial species. Within the project BSA, this community is distributed within annual grasslands. Ruderal vegetation within the project BSA occurs along the roadway margins of SRs 12 and 29. Species typical of the ruderal community type include many of the species observed in the annual grassland community type including ripgut, wild oats, soft cheat, black mustard, fennel, Italian thistle, chicory (*Cichorium intybus*), Mediterranean mustard (*Hirshfeldia incana*), and bull mallow (*Malva nicaeensis*).

Annual Grassland and Ruderal Habitat:

Non-native annual grassland habitat composes most of the project BSA. Open grassland is an important habitat for some raptors such as red-tailed hawk (*Buteo jamaicensis)*, and American kestrel (*Falco sparverius)*. California quail (*Callipepla californica*), mourning dove (*Zenaida macroura*), and western meadowlark (*Sturnella neglecta*) are a few seedeaters that use grasslands for foraging and nesting. Insect eaters such as western scrub-jays (*Aphelocoma californica*), barn swallows (*Hirundo rustica*), and northern mockingbirds (*Mimus polyglottos*) use the habitat only for foraging. Mammals such as the California vole (*Microtus californicus*), pocket gopher (*Thomomys bottae*), and black-tailed jackrabbit (*Lepus californicus*) forage and nest within grasslands. California ground squirrels (*Spermophilus beecheyi*) create burrows that also shelter other species. Mule deer (*Odocoileus hemiones columbianus)* use grasslands for grazing and resting at night. White tailed-kite (*Elanus leucurus*), loggerhead shrike (*Lanius ludovicianus*), and western burrowing owl (*Athene cunicularia hypugaea*) each have been observed foraging within annual grasslands within the BSA. Reptiles and amphibians rely on annual grassland for foraging and shelter; within the BSA, annual grassland provides upland movement/aestivation habitat for CRLF. Basins within annual grasslands also provide potential branchiopod habitat.

Ruderal habitat provides low-quality nesting and foraging opportunities for wildlife; however, they may provide upland movement/aestivation habitat for CRLF and basins within ruderal areas may provide potential branchiopod habitat. Wildlife species commonly found in ruderal and disturbed areas include white-crowned sparrow

(*Zonotrichia leucophrys*), Brewer's blackbird (*Euphagus cyanocephalus*), American goldfinch (*Carduelis tristis*), black-tailed jackrabbit, and California ground squirrel.

2) Coast Live Oak Woodland

The coast live oak woodland vegetation type, occupying 0.8 percent of the project BSA, is best developed in east Jameson Canyon, particularly on the north-facing slopes. The dominant plant species is coast live oak (*Quercus agrifolia*) with California bay (*Umbellularia californica*), big-leaf maple (*Acer macrophyllum*), and California buckeye (*Aesculus californica*) as common associates. The canopy is closed, with a sparse understory of grassland species and with an infrequently dense shrub cover such as poison oak *(Toxicodendron diversilobum),* common snowberry *[Symphoricarpos albus* var. *laevigatus* (*S. rivularis*)], and Himalayan blackberry (*Rubus discolor*).

Coast Live Oak Woodland Habitat:

Coast live oak woodlands provide habitat for a variety of wildlife species. At least sixty species of mammals may use oaks in some way. In California habitats where oaks form a significant part of the canopy or subcanopy, 110 species of birds have been observed during the breeding season. Cooper's hawk (*Accipiter cooperii)* may be expected to forage and nest within this habitat. Quail, wild turkeys (*Meleagris gallopavo)*, squirrels, and deer may be so dependent on acorns in fall and early winter that a poor acorn year can result in significant declines in their populations. Coast Live Oak Woodland provides upland movement/aestivation habitat for CRLF.

3) Coast Live Oak – Willow Riparian Forest

This type of riparian forest is limited to mesic areas, occupying 6.0 percent of the project BSA, and is found bordering the upper reaches of many of the creeks and tributaries within the project BSA. Coast live oak comprises the dominant tree species, red willow (*Salix laevigata)*, arroyo willow (*S. lasiolepis)*, and yellow willow (*S. lucida* ssp. *lasiandra*) occur as common associates. A second oak species, valley oak (*Q. lobata*) also frequently occurs. The understory is often sparse and devoid of herbaceous species cover, but occasionally can be very dense and populated by native perennial taxa including common snowberry, Santa Barbara sedge (*Carex barbarae*), California blackberry (*R. ursinus*), and horsetail (*Equisetum telmateia* ssp. *braunii*).

Coast Live Oak-Willow Riparian Forest Habitat:

Riparian areas are critical to many species of wildlife, including amphibians, reptiles, birds, and small and large mammals. These riparian areas provide cover, food, water, foraging, breeding and nesting habitat. The linear configuration of riparian areas creates corridors for animal movement that are critical for wildlife migration and dispersal. Typical species expected to occur in this habitat type within the project BSA include black phoebe (*Sayornis nigricans*), California quail, red-tailed hawks, raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and gray fox (*Vulpes cinereoargentius*).

Coast Live Oak-Willow Riparian Forest provides upland movement/aestivation habitat for CRLF.

4) Wetlands and waters

Wetlands and waters are distributed occasionally throughout 3.8 percent of the project BSA as depressional swales or ditches or in hillside seeps that are formed due to hydrologic conditions created by impermeable or semi-permeable clay soils or rocky substrates. Wetland community types present vary considerably along the project BSA, and include: riparian, seasonal (ephemeral pool), perennial (marsh), ponds, ditches and intermittent drainages, many of which function to convey roadside runoff. Some of these features support hydrophytic (wetland) vegetation and are referred to as wetlands. The unvegetated features are waters of the U. S. The dominant plant species observed in the wetland habitat types in the BSA are listed below.

Dominant and co-dominant plant species frequently observed in the wetland community type include brown-headed rush (*Juncus phaeocephalus var. paniculatus*) and creeping spikerush (*Eleocharis macrostachya*). Other wetland species such as Mexican rush (*J. mexicanus*), and common bulrush (*Schoenoplectus acutus*) are more locally distributed.Brown headed rush also occurs in small ephemeral wetlands on the open flats in the Napa Valley portion of the project BSA.

Wetland and Waters Habitat:

Wetland habitat varies considerably throughout the project BSA, and includes riparian, seasonal (ephemeral pool), and perennial (marsh) wetlands as well as ponds, intermittent drainages, and ditches, some of which function to convey roadside runoff. Wetland habitat is among the most productive wildlife habitat in California; it provides food, cover, and water for numerous amphibian, reptile, bird, and mammal species. Many species rely on wetland habitat for their entire life cycle. Wetlands and waters provide

aquatic breeding and aquatic movement/aestivation habitat for CRLF, foothill yellow-legged frog (*Rana boylii)*, western pond turtle (*Clemmys marmorata marmorata)*, and tricolored blackbird (*Agelaius tricolor*). Potential branchiopod habitat may be co-located with wetland and waters.

5) Alkali Grassland

Alkali grassland is limited to areas west of SR 29 near the Napa County Airport, occupying 2.7 percent of the project BSA. It is dominated by saltgrass (*Distichilis spicata*) but alkali rye, fat hen (*Chenopodium album*), and pitseed goosefoot (*C. berlandieri*) are also present.

Alkali Grassland Habitat:

Alkali grasslands provide upland movement/aestivation habitat for CRLF, and basins within alkali grasslands may provide potential branchiopod habitat. Alkali meadows are generally too wet to provide suitable habitat for small mammals; however, in late summer small mammals may visit alkali meadows that have dried. Mule deer may feed in alkali meadows, seeking forbs and palatable grasses. Waterfowl, especially mallards (*Anas platyrhynchos*), frequent streams flowing through alkali meadows. Yellow-headed (*Xanthocephalus xanthocephalus*) and red-winged (*Agelaius phoeniceus*) blackbirds occasionally nest in alkali meadows with tall vegetation and with adequate water to discourage predators Various amphibian species are abundant in wet meadows throughout California.

6) Landscaped Vegetation

Several trees and shrubs typical of landscaped or ruderal environments also occur within 1.7 percent of the project BSA. These include species such as coast redwood (*Sequoia sempervirens)*, cork oak (*Quercus suber*), blue gum (*Eucalyptus globulus*), edible fig (*Ficus carica*), silverleaf cotoneaster (*Cotoneaster pannosa*), peach (*Prunus persica*), and firethorn (*Pyracantha coccinea*). The Tree Survey Report Appendix L provides additional details on trees planted within the BSA.

Landscaped Vegetation Habitat:

Landscaped vegetation habitat within the project BSA is primarily represented by the golf course south of SR 12 in Napa County, although to a lesser extent it includes landscaping associated with commercial and industrial development near the SRs 29/12 interchange, gardens and lawns in the residential areas on both sides of SR 12 through Jameson Canyon, and stands of non-native trees. Within landscaped habitat, areas with mature

vegetation closely approximate the natural environment. In general, wildlife diversity increases and species density decreases while proportionately greater numbers of native species occur. Bird species that may be observed in landscaped vegetation include wrentits (*Chamaea fasciata*), bushtits (*Psaltriparus minimus*), oak titmouse (*Baeolophus inornatus*.), chestnut-backed chickadee (*Poecile rufescens*), California quail. Common mammals are black-tailed deer and black-tailed jackrabbit. Gopher snake (*Pituophis catenifer*) and western fence lizard (*Sceloporus occidentalis*) also occur in this habitat. Landscaped vegetation provides upland movement/aestivation habitat for CRLF.

7) Agricultural Lands

Agriculture lands occupy 12.3 percent of the project BSA and are composed primarily of active vineyards that occur from Kelly Road east to the Napa/Solano County line, but could include active or remnant orchards and strawberry farms. In this study, agricultural land does not include pasture, which is instead discussed in this Section in Annual Grassland.

Agricultural Lands Habitat:

Agriculture within the project BSA is primarily represented by vineyards that occur from west of Lynch Canyon Road to west of the Napa/Solano County line. Vineyards have been planted on deep fertile soils that once supported productive and diverse natural habitats. Larger and more diverse populations of wildlife were also supported by these native habitats; however, some species of birds and mammals have adapted to the vineyard habitats. Many have become “agricultural pests,” which has resulted in intensive efforts to reduce crop losses through fencing, sound guns, or other management techniques. Wildlife, such as deer and rabbit, browse on the vines; other wildlife, such as squirrel and numerous birds, feed on fruit. Some wildlife (e.g., mourning dove) are more passive in their use of the habitat for cover and nesting sites. Because grape vines are deciduous and relatively short in height, compared to orchards, they do not provide significant wildlife cover during cold and wet winter months. Many wildlife species act as biological control agents by feeding on weed seeds and insect pests; however, poison baits are often used to control birds and other animals that feed on grapes and berries, which may in turn be detrimental to species that prey on pest species. Vineyards and areas with excessive vegetation density do not support sufficient prey populations for Swainson’s hawk (*Buteo swainsoni*), and the intensive management does not make vineyards suitable upland dispersal habitat for CRLF.

Regional Special-status Species and Habitats of Concern

Three sensitive community types, five habitats of concern (i.e., natural community types with an extent limited to within California) and critical habitat for eleven federally endangered species, fifty-one sensitive plant species (Appendix G), and seventy-one sensitive animal species (Appendix H) were recorded. These tables, provide a compilation of those habitats and species obtained from CNDDB, CNPS, and USFWS database and include information pertaining to each species' habitat requirements and the likelihood that those habitats are present within the project BSA.

Impacts-

Vegetation- The following natural vegetation types occur within the BSA and are considered sensitive, coast live oak woodland, coast live oak-willow riparian forest, and wetlands. Alkali grassland is a natural community type but is considered part of the seasonal wetland habitat, which is described separately. Waters of the U. S. are also considered sensitive but these habitats are typically not vegetated and are discussed separately in Section 2.3.2. Physical characteristics of the natural community types are described in this section. Habitat mapping results for the terrestrial natural habitat types (coast live oak woodland and coast live oak - willow riparian forest) are also discussed in the affected environment in this section.

The remaining habitats present within the BSA (e.g., annual grassland) are not natural community types and are not considered sensitive; therefore, they are not discussed further in this section.

Table 2.3.1.2 shows the results of habitat mapping within the BSA by habitat type and project element.

Impacts to sensitive natural and urban habitats are shown in Table 2.3.1.2 and Table 2.3.1.3 provides the acreages of non-native or urban vegetation community types present in the BSA. Results of habitat mapping show that the annual grassland and ruderal vegetation type is the most prevalent throughout both the canyon and interchange portions of the project, totaling 192.9 ha (476.6 acres). Agricultural lands are the next most common vegetation type, encompassing 45.4 ha (112.2 ac).

Table 2.3.1.2
Habitat Permanently and Temporarily Impacted within the BSA – Tight Diamond Alternative

	Tight Diamond Alternative						Temporary Impact					
	Canyon		Interchange		Total		Canyon		Interchange		Total	
	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)
Agricultural Lands	5.1	12.5	0.0	0.0	5.1	12.5	9.0	22.2	0.0	0.0	9.0	22.2
Alkali Grassland	0.0	0.0	1.7	4.2	1.7	4.2	0.0	0.0	2.7	6.6	2.7	6.6
Annual Grassland and Ruderal	14.8	36.6	5.8	14.2	20.6	50.8	30.5	75.3	15.8	39.1	46.3	114.4
Coast Live Oak Woodland*	0.6	1.4	0.0	0.0	0.6	1.5	0.6	1.4	0.1	0.1	0.6	1.6
Coast Live Oak - Willow Riparian Forest*	2.7	6.8	0.1	0.3	2.9	7.1	1.6	3.9	0.1	0.3	1.7	4.2
Landscaped Vegetation*	0.5	1.2	0.0	0.0	0.5	1.2	1.0	2.4	0.3	0.6	1.2	3.1
Wetlands	0.5	1.3	1.0	2.5	1.5	3.8	1.4	3.5	0.8	1.9	2.2	5.5
Other Waters	0.2	0.4	0.0	0.1	0.2	0.5	0.4	0.9	0.0	0.1	0.4	1.1

* Woodland permanent impact areas include utility easements and temporary construction easements

Table 2.3.1.3
Habitat Permanently and Temporarily Impacted within the BSA – Single Point Alternative

	Permanent Impact						Temporary Impact					
	Canyon		Interchange		Total		Canyon		Interchange		Total	
	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)	ha	(ac)
Agricultural Lands	5.1	12.5	0.0	0.0	5.1	12.5	9.0	22.2	0.0	0.0	9.0	22.2
Alkali Grassland	0.0	0.0	2.0	4.9	2.0	4.9	0.0	0.0	2.4	5.8	2.4	5.8
Annual Grassland and Ruderal	14.9	36.8	6.1	15.0	21.0	51.8	30.4	75.1	15.5	38.3	45.9	113.5
Coast Live Oak Woodland*	0.6	1.4	0.0	0.1	0.6	1.5	0.6	1.4	0.0	0.1	0.6	1.5
Coast Live Oak - Willow Riparian Forest*	2.7	6.8	0.1	0.3	2.9	7.1	1.6	3.9	0.1	0.3	1.7	4.2
Landscaped Vegetation*	0.5	1.2	0.0	0.0	0.5	1.3	1.0	2.4	0.3	0.6	1.2	3.1
Wetlands	0.5	1.3	1.1	2.8	1.7	4.1	1.4	3.5	0.6	1.6	2.1	5.1
Other Waters	0.2	0.4	0.0	0.1	0.2	0.5	0.4	0.9	0.0	0.1	0.4	1.0

* Woodland permanent impact areas include utility easements and temporary construction easements

Habitat- The two proposed alternatives are similar in many respects, and the amount of impact potentially occurring to the two natural sensitive types is expected to be the same regardless if the preferred final interchange build alternative is a Tight Diamond or Single Point configuration. The permanent habitat impacts to coast live oak woodland habitat are 0.6 ha (1.5 ac), with impacts to coast live oak – willow riparian habitat totaling 2.9 ha (7.1 ac).

Temporary impacts to coast live oak woodland habitat are expected to be on the order of 0.6 ha (1.6 ac) for the Tight Diamond Alternative, with slightly less impact estimated to coast live oak woodland habitat due to the Single-Point Alternative [0.6 ha (1.5 ac)]. Temporary Impacts to the coast live oak – willow riparian habitat are greater than those expected for the coast live oak woodland habitat, totaling 1.7 ha (4.2 ac) for both project alternatives.

Avoidance, Minimization and/or Mitigation Measures—All feasible and practical measures will be undertaken to avoid or minimize impacts to natural sensitive terrestrial habitat types. These will include:

1. Design modifications that may allow Caltrans to avoid sensitive habitat including coast live oak and coast live oak – willow riparian habitat and reduce the impact below the level of significance.
2. Designating any sensitive habitats observed within the temporary work area as an environmentally sensitive area (ESA), and use of orange construction fencing and placement of signs to prohibit intrusion into the ESAs.
3. Showing the location of all ESAs on project construction drawings and monitoring the ESAs during construction.

Compensatory Mitigation

The loss of sensitive natural habitat, including the loss of individual oak and riparian trees, will be mitigated based on the area of oak woodland and riparian affected. An Oak Woodland and Riparian Habitat Mitigation Plan will be prepared detailing coast live oak woodland and coast live oak, willow riparian habitat restoration activities, which includes details on native oak woodland and riparian tree species planting. These plans have been submitted to the resource agencies for their review before restoration activities are initiated. In addition to planting details such as the species planted and planting densities, the restoration plan will include information on

performance criteria, monitoring, annual reporting, and remedial actions, should monitoring determine that the success criteria have not been achieved.

Caltrans is in the process of identifying an onsite mitigation site to implement permanent impacts to these habitats. Where onsite mitigation is unavailable or infeasible, Caltrans will seek nearby offsite mitigation for the permanent loss of these habitats.

Cumulative Impacts- The geographic scope of the project vicinity for the cumulative impact analysis is defined as an area within 0.4 km (0.25 miles) of the combined footprint of the SRs 29/12 interchange and the SR 12 Jameson Canyon Road Widening project. The table below shows the projects that were considered to analyze cumulative impacts for this project:

TABLE 2.3.1.4
List of Projects considered for Cumulative Impact Assessment for Biological Study

Projects	Environmental Documents Studied
1. Napa County Airport	Environmental Impact Report(EIR)
2. Montalcina at Napa Golf Course	Draft EIR
3. Suscol Flyover Project	Natural Environmental Study Report (NES)
4. Red Top Truck Climbing Lane Project	Negative Declaration/Finding of No Significant Impact
5. North Connector Project	Initial Study/Proposed Mitigated Negative Declaration
6. I-80 North Connector project	NES

No significant cumulative impacts are anticipated to coast live oak woodland and coast live oak – willow riparian resources from this project and the projects listed above. Cumulative impacts to coast live oak woodland and coast live oak, willow riparian forest were identified for the projects identified above. The impacts from these projects will be mitigated to a less than significant level. Therefore, the project is not expected to have a significant contribution to any potential cumulative impacts to these sensitive natural habitat types.

2.3.2 Wetlands and Other Waters

Regulatory Setting- Wetlands and other waters are protected under several laws and regulations. At the federal level, the Clean Water Act (33 U.S.C. 1344) is the primary law regulating wetlands and waters. The Clean Water Act regulates the discharge of dredged or fill material into waters of the United States, including wetlands. Waters

of the United States 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 Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that no discharge of dredged or fill material can 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. U. S. Army Corps of Engineers (USACE) manages the Section 404 permit program with oversight by the U. S. Environmental Protection Agency (EPA).

The Executive Order for the Protection of Wetlands (E.O. 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this executive order states that a federal agency, such as the Federal Highway Administration, 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 Department of Fish and Game (CDFG) and the Regional Water Quality Control Boards (RWQCB). In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission) may also be involved. Sections 1600-1607 of the 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 CDFG before beginning construction. If CDFG determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFG 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 ACOE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFG.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. The RWQCB also

issues water quality certifications in compliance with Section 401 of the Clean Water Act. Please see the Water Quality section for additional details.

Figure 2.3.2.1

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Affected Environment:

Wetlands- In very general terms, waters of the U. S. are features within which water flows or ponds, such as creeks, rivers, and streams and their tributaries, or oceans, bays, or ponds, and that lack vegetation.

Wetlands and other waters of the U.S. are distributed occasionally throughout 3.9 percent of the project BSA as depressional swales or ditches or in hillside seeps in areas underlain by a restrictive soil layer that results in a seasonally perched water table. Figure 2.3.2.1 show the location of wetlands and waters of the U.S. within the project study area.

Wetland community types present vary considerably along the project study area, and include: riparian, seasonal (ephemeral pool), perennial (marsh), ponds, and ditches and intermittent drainages, many of which function to convey roadside runoff. Some of these features support hydrophytic (wetland) vegetation and are referred to as wetlands. The majority of the seasonal wetlands occur in the vicinity of the SR 29/SR 12 interchange, and towards the eastern section of SR 12. Vegetation associated with seasonal wetlands is variable depending on the duration of inundation. Species generally associated with short duration ponding include Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), curly dock (*Rumex crispus*), Harding grass (*Phalaris aquatica*), bristly ox-tongue (*Picris echioides*), and Italian ryegrass. In areas subject to prolonged inundation, associated species include semaphore grass (*Pleuropogon californicus*), tall cyperus (*Cyperus eragrostis*), broad-leaved cattail (*Typha latifolia*), and hardstem bulrush (*Scirpus actutus*).

***Waters of the U. S*.-** Hydrology in the BSA is dominated by three perennial and intermittent creeks that are mapped on USGS maps: Fagan Creek (Napa County), Sheehy Creek (Napa County), and an unnamed intermittent drainage (informally known as Jameson Creek, Solano County). Creeks and their tributaries located in the Napa County portion of the BSA ultimately discharge into the Napa River whereas creeks and their tributaries situated within the Solano County portion of the BSA drain into Cordelia Slough.

In addition to these larger creeks and their tributaries, numerous constructed drainages are also present along SR 29, SR 12 and the California Northern Railroad tracks, which roughly parallels the south side of SR 12 in the eastern half of the project. Some of these drainages are considered to be waters of the U. S., while

others support hydrophytic vegetation and are considered wetlands. Besides the wetlands and waters of the US there are also water bodies known as creeks, other waters, ditches and drains that are present in the project BSA.

Perennial and Intermittent Creeks and Other Waters

Three perennial or intermittent creeks occur in the BSA. These include: Sheehy, Fagan, and an unnamed intermittent drainage (informally known as Jameson Creek). These creeks and tributaries vary in width from approximately 1.5 to 15.2 m (5 to 50 ft). With the exception of Fagan Creek and its tributary, which was primarily unvegetated, most of the creeks and drainages supported emergent wetland vegetation. Plant species include hardstem bulrush, California bulrush (*Scripus californicus*), and broadleaved cattails. Typical over-story vegetation includes trees and shrubs such as arroyo willow, coast live oak, bluegum eucalyptus, and Himalayan blackberry.

Roadway and Railroad Ditches/Drainages

Roadway and railroad ditches and drainages were found to range in width from approximately 0.9 to 3.0 m (3 to 10 ft) and occur predominantly along SR 29 and the California Northern Railroad tracks along the south side of SR 12. These features were constructed to convey storm water runoff from the roadways and railroad tracks and generally discharge into the creeks or their tributaries. Vegetation within these features is variable with some features characterized by small trees and shrubs such as arroyo willow, and Himalayan blackberry, with others characterized by cattails, common spikerush, rabbitsfoot grass, and Harding grass, or were largely unvegetated.

Impacts- A total of 181 wetlands and other waters were identified within the BSA. Sixty-seven of these features are seasonal wetlands and 114 are considered waters of the U. S. The amount of seasonal wetlands or other waters that may not be subject to regulation by the USACE is preliminarily estimated here. The exact amount will not be definitively known until the USACE (San Francisco District) verifies the wetland delineation and makes a determination on the limit of their jurisdiction. It is likely that any USACE non-jurisdictional wetlands and other waters features would be regulated by the RWQCB under the Porter-Cologne Act.

Due to access constraint, the total amount of seasonal wetland and other waters within the BSA is likely to change as more access to study area is available. Most likely, the

amount of wetland and other waters present within the BSA would be expected to decrease as the wetland delineation is refined.

A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for this project for Section 404 permit actions; this certification or waiver is issued by the RWQCB. Current assessment of the impact to wetlands may require an Individual Permit from the USACE.

Permanent and temporary impacts to potentially non-jurisdictional features are almost exactly the same for each alternative. Impacts to potentially non-jurisdictional features total 0.47 acre for permanent impacts and 0.28 acre for temporary impacts, for both alternatives. A summary of permanent and temporary impacts to wetlands and other waters by project alternative is contained in Table 2.3.2.1.

Table 2.3.2.1 Impacts to Potential Waters of the U.S. Including Wetlands Within the BSA, by Alternatives

	Tight Diamond Alternative				Single-Point Alternative			
Impact Type (Permanent/ Temporary	Permanent		Temporary		Permanent		Temporary	
	ha	ac	ha	ac	ha	ac	ha	ac
Potentially jurisdictional Wetlands	1.4	3.5	2.2	5.3	1.6	3.8	2.0	5.0
Potentially Jurisdictional Other Waters	0.1	0.3	0.4	0.9	0.1	0.3	0.4	0.9
Subtotal	**1.5**	**3.8**	**2.5**	**6.2**	**1.7**	**4.1**	**2.4**	**5.9**
Potentially Non-jurisdictional Wetlands	0.1	0.3	0.1	0.1	0.1	0.3	0.1	0.1
Potentially Non-jurisdictional Other Waters	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1
Subtotal	**0.2**	**0.5**	**0.1**	**0.3**	**0.2**	**0.5**	**0.1**	**0.3**
TOTAL	**1.7**	**4.2**	**2.6**	**6.5**	**1.9**	**4.6**	**2.5**	**6.1**

Notes:

1. In some cases, access was restricted and wetlands and other waters were mapped using aerial photographic interpretation and limited ground-truthing from the edge of the ROW. Calculations shown here likely represent an over-estimate
2. All calculations are preliminary and are subject to change pending the outcome of the USACE wetland verification
3. Slight differences in calculations do not show due to rounding of significant digits

Caltrans will implement avoidance and minimization measures and compensatory mitigation to ensure no net loss of habitat functions and values. Permanent impacts to potentially jurisdictional wetlands and other waters are very similar for both proposed alternatives, totaling 3.8 acre for the Tight Diamond Alternative compared with 4.1 acre for the Single-Point Alternative. Temporary impacts to potentially jurisdictional features show a similar pattern, with 6.2 acres compared with 5.9 acres for the Tight Diamond and Single-Point Alternatives, respectively. Table 2.3.2.1 shows the impacts of the two different alternatives.

Avoidance, Minimization and/or Mitigation Measures:

All feasible and practical measures will be undertaken to avoid or minimize impacts to seasonal wetlands and other waters during construction. These measures are described below.

1. Wetland assessments will be conducted in parcels for which access was not previously obtained in order to investigate additional parcels, refine the delineation, and reduce the potential amount of impact. Additional wetland delineations will be conducted by Caltrans prior to project construction as part of the USACE jurisdictional determination.
2. To the maximum extent practicable, all construction activities in the temporary work area will avoid wetlands and other waters of the U. S. All wetlands and waters within the temporary work area will be designated as an ESA and protected with appropriate fencing and signage. All ESAs will be shown on the final construction drawings.
3. All work will be performed in accordance with a SWPPP. Also, BMPs to prevent erosion into onsite or offsite waters of the U. S., (including wetlands) will be implemented and may include the use of silt fences, sandbags, detention basins, and other means as appropriate.
4. The topography and grade will be restored to preconstruction conditions in wetland and other waters areas that are temporarily affected. Following all grading and earthwork, these areas will be either be replanted or reseeded with the appropriate plant species, if determined necessary, or monitored following construction, to determine that vegetation comparable to the pre-existing condition has naturally regenerated.
5. Unavoidable wetland and other waters losses estimated to occur once additional wetland investigations are performed or that occur during construction will be tallied and incorporated into project permits and compensatory mitigation documents and requirements as appropriate. Compensatory mitigation is described below.

In cases where impacts to wetlands and other waters are unavoidable, Caltrans will mitigate impacts to a less than significant level through wetland preservation and/or creation at an approved ratio as determined during the permitting process by the USACE and the RWQCB.

Compensatory mitigation will consist of the following elements:

1. To minimize the potential for onsite or offsite erosion into other wetland features, on-site roadside ditch wetland or other waters creation will occur prior to project completion and will be completed prior to the beginning of the wet season (typically October 31st).
2. Standard erosion control measures (BMP) and the preparation of a SWPPP will be required of the contractor and implemented during construction to ensure that sedimentation into adjacent wetlands and other waters does not occur and indirectly impact adjacent resources. Monitoring of erosion control measures will be conducted during construction and remedied if found insufficient.
3. Creation of wetland habitat as compensation for permanent impacts will be required. This may be accomplished through habitat creation, at either an on- or off-site location, or through restoration, preservation, or a combination of these two approaches.
4. Creation of wetland and other waters habitat will be accomplished through steps outlined in a Conceptual Wetland Restoration Plan that will be prepared and submitted in support of obtaining the project permits, agreements, waivers, or approvals from the USACE, CDFG, and RWQCB.
5. The mitigation ratio for the creation of wetland resources will range from between 1:1 to 3:1 (mitigation to impact) on an acreage basis, either on-site or off-site. The exact mitigation ratio (acreage basis) will be dependent on the type and habitat quality of the wetlands and other waters impacted, the quantity and location of impacted wetlands resources, the location of the proposed creation, and the outcome of agency discussions.
6. The Conceptual Wetland and Other Waters Creation Plan will follow guidelines established by the USACE. A discussion of the annual reporting requirement, a monitoring plan, and remedial measures, should monitoring determine that success criteria are not being achieved. The Caltrans District 4 Office of Biological Sciences and Permits will plan and implement the on-site mitigation, in conjunction with the Caltrans District 4 Office of Landscape Architecture.
7. Compensatory mitigation could also be accomplished by purchasing mitigation credits at a wetland mitigation bank that services Solano and Napa Counties. Currently, there is only one USFWS approved active mitigation bank that services Solano and Napa Counties—the Elsie Gridley Multi-Species Conservation Bank. However, other banks nearby the project vicinity are pending or proposed and it is possible a suitable bank would be active at the time the

mitigation credits are required. Additional mitigation opportunities may be available with the Solano Land Trust south of the project in Lynch Canyon.

With the implementation of the above measures, impacts to wetlands and other waters will be reduced to a less than significant level.

Cumulative Impacts

The geographic scope of the project vicinity for the cumulative impact analysis is defined as an area within 0.4 km (0.25 mile) of the combined footprint of the SRs 29/12 interchange and the SR 12 Jameson Canyon Road widening project. Projects included in this cumulative impact analysis include the same projects discussed in the Natural Community section, section 2.3.1. Projects included in this cumulative impact analysis include the projects shown in Table 2.3.1.4.

Impacts to wetlands and other waters occurring as a result of these proposed project will also be less than significant after mitigation is implemented. No significant cumulative impacts are anticipated to occur to wetland resources from the SRs 29/12 intersection improvement in combination with the projects listed above. Therefore, the project is not expected to have a significant contribution to any potential cumulative impacts to wetland resources and the incremental effect is not expected to be cumulatively considerable.

2.3.3 Plant Species

Regulatory Setting- The U. S. Fish and Wildlife Service (USFWS) and California Department of Fish and Game (CDFG) share 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 afforded varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species Section 2.3.4 in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including CDFG fully protected species and species of special concern, USFWS

candidate species, and non-listed California Native Plant Society (CNPS) rare and endangered plants.
The regulatory requirements for FESA can be found at United States Code 16 (USC), Section 1531, et. seq. See also 50 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, Public Resources Code, Sections 2100-21177.

Vegetation Community- Eight vegetation community types that occur within the project study area are discussed in section 2.3.1.

Trees

Affected Environment- A total of 1,225 trees were mapped within the project footprint during the 2006 and earlier Caltrans surveys. Native oak woodland and riparian tree species are considered sensitive because they are related species of the coast live oak woodland and coast live oak and willow riparian habitat types. Within the project BSA there are various types of Oaks and also ornamental tree species occur. They comprise the landscaped vegetation type, and these landscaping trees are not considered sensitive from a vegetation standpoint.

Impact- A total of 1,225 trees (comprised of twenty-three tree species) were mapped and/or tabulated within the proposed project permanent impact area and temporary work area. The majority of the trees are native, 74 to 87 percent, depending on their location within either the permanent impact area or the temporary work area.

Table 2.3.3.1 below show the implementation of the project will result in the permanent loss of up to 547 trees if the Tight Diamond Alternative is constructed, or 528 trees with the Single-Point Alternative.

An unknown number of trees within the temporary work area will also be damaged or removed during construction, for each alternative. The number of trees affected within the temporary work area is unknown at this time and will be tallied during construction and the number added to the total mitigation required for the project.

The following avoidance and minimization efforts will be implemented to reduce impacts to native oak and riparian trees to the maximum degree possible.

Table 2.3.3.1 Percentage of Native Trees, Non-Native Trees, and Trees That are Native to Limited Natural Stands But Are Used As a Landscaping Tree

Native or Non-native Tree Species	Number of Trees	Percentage of Trees (547 total)	Number of Trees	Percentage of Trees (690 total)
	Permanent Impact Area (Combined Catchline)*		Temporary Work Area (Combined Catchline)*	
Native tree species	476	87%	510	74%
Native to limited natural stands but used as a landscaping tree	46	8%	129	19%
Non-native tree species	25	5%	50	7%
Total	**547**	**100%**	**690**	**100%**

Notes:

* The combined catchline is the outer extent of the two proposed alternatives that represents the maximum extent of permanent impact

Avoidance, Minimization and/or Mitigation Measures—The minimization efforts for the tree impacts are listed below.

1. Design of the proposed project will be modified to avoid native oak and riparian tree species and reduce the impact below the level of significance.
2. Any individual native oak woodland or riparian trees greater than 4 inches diameter at breast height observed within the temporary work area will be designated as an ESA and protected with orange construction ESA fencing and signage.
3. The location of all ESAs will be shown on project construction drawings and monitored during construction.

Permanent impacts to native oak woodland and riparian trees will be addressed on an acreage basis as part of the oak woodland and riparian habitat mitigation effort rather than replacing individual trees on a stem basis.

Impacts to landscaping vegetation (defined as non-native trees, and native trees used as landscaping species), will be mitigated by replanting landscaping tree species onsite following construction. A separate landscaping plan will be prepared for the installation of landscaping species within the project BSA. Alternatively, the loss of landscaping tree species could be mitigated by adding the total number of landscaping

trees to be affected to the total number of trees to be planted in the oak woodland and riparian habitat mitigation areas, and an appropriate native species substitute selected.

Cumulative Impacts- The geographic scope of the project vicinity for the cumulative impact analysis is defined as an area within 0.4 km (0.25 mile) of the combined footprint of the SRs 29/12 interchange and the SR 12 Jameson Canyon Road. The cumulative impact analysis projects include the same set of projects discussed in cumulative projects in section 2.3.1. Projects included in this cumulative impact analysis include the projects shown in Table 2.3.1.4.

Impacts to native trees were identified as part of these projects. These projects will mitigate impacts to native trees to a less than significant level. No significant cumulative impacts are anticipated to native trees from the SRs 29/12 project and the projects listed above. The project is therefore not expected to have a significant contribution to any potential cumulative impacts to native trees.

Special-status habitats, communities and Plant Species

Affected Environment- The natural vegetation types occur within the BSA and are considered sensitive: coast live oak woodland, coast live oak, willow riparian forest, and wetlands. Alkali grassland is a natural community type but is considered part of the seasonal wetland habitat, which is described separately. Waters of the U. S. are also considered sensitive but these habitats are typically not vegetated and are discussed separately in Section 2.3.1. Section 2.3.3 discusses the physical characteristics of the natural community types in these sections. Habitat mapping results for the terrestrial natural habitat types (coast live oak woodland and coast live oak - willow riparian forest) are also described in Section 2.3.1.

The remaining habitats present within the BSA (e.g., annual grassland) are not natural community types and are not considered sensitive; therefore, they are not discussed further in this section.

The project BSA was surveyed for special-status plant species in 2006 and 2007. No special-status plant species were found within the project BSA in areas that were surveyed. Results of the habitat assessment determined that the probability of special-status plant occurrence within the BSA was low based on the observed BSA conditions that is degree of disturbance, presence of localized rock substrate and edaphic conditions, and prevalence of non-native species.

However, two special-status plants, the streamside daisy (*Erigeron bioletti)*, a CNPS List 3 plant, and long-petaled iris (*Iris longipetala*), a CNPS List 4 species, were identified adjacent to the BSA outside of and approximately fifty feet from the very northeastern edge of the BSA.

Impacts- Access limitations prevent conclusive determination of the extent of potential project-related impacts to special-status plant species. Parcels with suitable target species habitat that were directly surveyed but were not surveyed at the appropriate time of year to determine if potentially occurring special-status plants are present will be surveyed prior to construction. The pre-construction surveys will follow survey protocols and the surveys will be conducted by a Caltrans qualified botanist.

Based on the habitats identified in the project BSA, and the degree of site disturbance observed, the likelihood of special-status plant species occurrence (except for streamside daisy and long-petaled iris) is low. However, if special-status plants are encountered during the pre-construction surveys, the potential impacts to special-status plants will be identified and quantified, and appropriate mitigation will be developed and implemented. All feasible and practical measures will be undertaken to avoid or minimize impacts to special-status plant species, should any be identified during the pre-construction surveys. These measures are described further below.

Avoidance, Minimization and/or Mitigation Measures—The significance of the potential impact, should any special-status plants occur, is dependant on the species affected, the characteristics of species distribution and abundance both regionally and locally, and the number of individuals and quantity of habitat affected.

If special-status plant species are identified during preconstruction surveys, feasible and practical measures will be undertaken to avoid or minimize impacts to the population(s). These will include:

1. Design modifications that may allow Caltrans to avoid the species and reduce the impact below the level of significance.
2. Designation of any special status plant populations observed within the permanent impact area or temporary work area as an ESA, and delimiting the ESA with orange construction fencing and signage.
3. Showing the location of all ESAs on project construction drawings and monitoring them during construction.

Compensatory Mitigation- Based on habitats identified in the BSA, the likelihood of special-status species occurrence (except for streamside daisy or long-petaled iris) is low. However, if special-status species are encountered during the preconstruction surveys, the appropriate compensatory mitigation will be developed and implemented in coordination with the appropriate resource agencies. If the project cannot be redesigned to completely avoid or minimize the impact to the species, significant impacts to the plant population will be mitigated through:

1. Development and implementation of a Rare Plant Relocation Plan, which would describe relocation to an agency-approved suitable location.
2. Preservation of an existing population of the species at a ratio of at least 1:1 (a ratio of species habitat impacted to species habitat preserved) or higher, as determined appropriate based on the quality of the habitat and species impacted and the quality of the preserved habitat.
3. Coordination and consultation with USFWS and CDFG for a determination of the likelihood of adverse effects and development of appropriate mitigation.
4. Restoration of areas of temporary disturbance to the pre-existing grade and reseeding with a site-specific mix of native vegetation if determined appropriate; or salvaging the topsoil within the plant population, storing it, and reinstallation of the topsoil following construction.

Through implementation of these measures, impacts to special status plants, should any be identified during preconstruction surveys, will be reduced to a less than significant level.

Cumulative Impacts- It is expected that the overall likelihood of special status plant occurrence within the BSA is low for the two rare plant species, the long-petal iris and the streamside daisy.

No impacts to rare plants were identified as part of the projects listed in Table 2.3.1.4, except for the North Connector project, which will not result in significant impacts to the long-petal iris and the streamside daisy, the two species observed directly adjacent to, but outside of, the proposed project BSA. The Napa County Airport Specific Plan and EIR did not specifically include protocol level surveys for rare plants, but describes that suitable rare plant habitat is present, and states that surveys prior to project implementation would be conducted and mitigation provided. Potential impacts to rare plant resources could occur within the Napa County Airport Specific

Plan Area; however, these impacts will be mitigated. No other significant impacts to rare plants are predicted to occur as part of the remaining projects, listed above.

2.3.4. Animal Species

Regulatory Setting- Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NOAA Fisheries) and the California Department of Fish and Game (CDFG) are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with special status wildlife that is not listed or proposed for listing under the state or federal Endangered Species Act. All other special status animal species are discussed here, including CDFG fully protected species and species of special concern, and USFWS or NOAA Fisheries 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 1601 – 1603 of the Fish and Game Code
- Section 4150 and 4152 of the Fish and Game Code

In addition to state and federal laws regulating impacts to wildlife, there are often local regulations (example: county or city) that need to be considered when developing projects. If work is being done on federal land (BLM or Forest Service, for example), then those agencies' regulations, policies, and Habitat Conservation Plans are followed.

The primary wildlife habitats within the project study area are described in this section. The wildlife habitats correspond to the vegetation types discussed in Section 2.3.1 in Natural Communities and its habitats. The threatened and Endangered Species are discussed in Section 2.3.5. The special status species are discussed in this section.

Three sensitive community types, five habitats of concern (i.e., natural community types with an extent limited to within California) and critical habitat for eleven federally endangered species, fifty-one sensitive plant species, and seventy-one sensitive animal species were recorded from within the twelve United States Geological Survey (USGS) quads surrounding the project. A compilation of those habitats and species obtained from CNDDB, CNPS, and USFWS database queries for occurrences within the Cordelia and Cuttings Wharf USGS quadrangles as well as the ten surrounding USGS quadrangles, and include information pertaining to each species' habitat requirements and the likelihood that those habitats are present within the project BSA.

Regional Special-status Species and Habitats of Concern

***Foothill Yellow-legged frog* (FYLF; *Rana boylii*)**

Affected Environment- The foothill yellow-legged frog (FYLF; *Rana boylii*) is a State Species of Concern (SSC) that occurs throughout the Coast Ranges from the Oregon border, south to the Transverse Range in Los Angeles County, in most of northern California west of the Cascade crest. Based on habitats identified in our project BSA, the likelihood of FYLF occurrence is low; all parcels could not be accessed, however, and their presence cannot be completely ruled out. Potential impacts include loss of individuals during construction in general and use od heavy equipment movement can cause temporary loss of foraging and potential breeding habitat.

Avoidance, Minimization, and/or Mitigation Measures—Because suitable habitat for FYLF occurs within currently inaccessible parcels, qualified biologists will conduct pre-construction surveys for FYLF in or near the suitable creek and riparian habitat. Any FYLF that are encountered during project activities will be relocated. Relocation of state species of concern associated with this project will require a letter of authorization from CDFG. Because of the overlap in habitat requirements, the avoidance and minimization measures that will be implemented for CRLF (discussed in Section 2.3.5) are expected to minimize the potential impacts to FYLF habitat.

Compensatory Mitigation- With implementation of the above avoidance and minimization measures, and with compensatory mitigation for the project's impacts to waters and wetlands and CRLF habitat, no further compensatory measures will be required.

Cumulative Impacts

The geographic scope of the project vicinity for the cumulative impact analysis is defined as an area within 0.25 mile of the footprint of the SRs 29/12 interchange and SR 12 Jameson Canyon Road widening project.

Impacts to FYLF will be reduced to a less than significant level after mitigation is implemented. Therefore, no significant cumulative impacts are anticipated to FYLF resources from the proposed project.

Northwestern and Southwestern Pond Turtle (Clemmys marmorata)

Intergrades of two closely related subspecies of western pond turtles with special status may occur within the project BSA, the northwestern [*Clemmys (Actinemys, Emys) marmorata marmorata*] and southwestern [*Clemmys (Actinemys, Emys) marmorata pallida*] pond turtle. They are both SSC and impacts and mitigation would be the same for either species.

Western pond turtles range from uncommon to common in suitable aquatic habitat throughout California. The northwestern subspecies includes those that are located in the Sacramento Valley and San Francisco Bay area north to Puget Sound. Western pond turtles require some slack- or slow-water aquatic habitat, and are uncommon in high-gradient streams.

Impacts- Access limitations prevent conclusive determination of the extent of potential project-related impacts to western pond turtles. Pre-construction surveys will be conducted by a qualified biologist familiar with the local fauna to determine if the project will impact western pond turtles. The proposed action could have permanent and temporary direct effects to the western pond turtle, if present. Large equipment and earth moving activities can crush or bury turtles. This mortality could potentially include the destruction of occupied nests. Other individuals may be affected through loss of habitat, possible disruption of foraging, and harassment from increased human activity during construction.

Avoidance, Minimization, and/or Mitigation Measures—Caltrans biology staff or other qualified biologist will conduct pre-construction surveys for western pond turtles prior to the start of any construction activities for the proposed project. Relocation of State Species of Concern associated with this project will require a letter of authorization from CDFG. Because of the similarity in habitat requirements,

the avoidance, minimization measures, and compensatory mitigation measures that will be implemented to protect CRLF breeding are expected also to minimize the potential to impact western pond turtle habitat.

Compensatory Mitigation -With implementation of the avoidance and minimization measures discussed in Section 2.3.5 for CRLF, and with compensatory mitigation for the project's impacts to waters and wetlands and CRLF habitat, no further compensatory measures will be required for this species.

Cumulative Impacts- The projects of Table 2.3.1.4 will incorporate similar avoidance, minimization, and compensation to mitigate impacts to western pond turtles. By incorporating these and similar mitigation measures, significant cumulative impacts to western pond turtles are not anticipated.

Of the projects reviewed in the project vicinity, only the IS/PMND for the North Connector project identified an impact to pond turtles. Mitigation Measure in the IS/PMND for the North Connector project provides that unavoidable potentially occupied upland burrowing habitat within 304.8 m (1000 ft) of a pond at the west end of the study area will be preserved.

The North Connector project will incorporate similar avoidance, minimization, habitat creation and/or habitat preservation measures to mitigate their impacts to western pond turtles. By incorporating these and similar mitigation measures, significant cumulative impacts to western pond turtles are not anticipated.

Mitigation for impacts to western pond turtles habitat will be implemented too if found, thereby reducing western pond turtle impacts to a less than significant level after mitigation is implemented. Therefore, no significant cumulative impacts are anticipated.

Special-Status and Protected Birds

Eleven species of birds with special status are present or presumed to be present within the project area. Ten of these are SSC, and one is State-listed as threatened (ST; Swainson's hawk). Swainson's hawk was not observed during surveys within the project BSA; however, a Section 2081 incidental take permit will be required if this species will be affected by project-related activities.

Three special-status or fully protected bird species have been observed or are expected to be present within the project BSA:

Golden eagle is a SSC that is fully protected by CDFG and is also protected under the federal Bald and Golden Eagle Protection Act (BGEPA);

White-tailed kite is a fully protected bird. CDFG does not issue take permits for fully protected species, and there are no provisions in the California Fish and Game Code for mitigating effects to fully protected species.

L*oggerhead shrike* is a SSC. CDFG does not issue take permits for fully protected species, and there are no provisions in the California Fish and Game Code for mitigating effects to fully protected species.

In addition to the state or federal listing status, most birds that occur within the project BSA are protected under the Migratory Bird Treaty Act (MBTA) and CDFG codes. Besides these listed species two additional species nests and a rookery were found during surveys that are protected by the MBTA.

Cliff swallow (*Petrochelidon pyrrhonota*) and *Black phoebe* nests were observed inside culverts during surveys and a Great *blue heron* (*Ardea herodius*) rookery is known to occur in the vicinity of the project footprint.

Impacts- Nest removal activities will affect bird nesting habitat and would constitute a potential impact to the nesting habitat; however, because nesting habitat in the BSA is only a small percentage of what exists in the local area, this impact is expected to be a less than significant impact. Therefore, significant impacts to nesting birds are not anticipated.

Great blue heron rookery abandonment would likely increase with increased visits by humans and with road building activity within 0.5 km (0.3 mi). Some colonies may splinter and attempt to settle nearby following abandonment. Response to disturbance can vary between sites and time of breeding season. Early in the season, herons flush easily from nests with the slightest disturbance; after eggs, they fly reluctantly and return quickly to nests; few flush when chicks are in the nest.

Removal of trees, shrubs, and other vegetation may result in direct impacts to these species due to the loss of possible nests and any associated eggs and/or nestlings. Noise and construction activities within the BSA may preclude or disrupt nesting in

these areas throughout the duration of the construction period. Indirect impacts may result from the loss of nesting habitat; however, these impacts will be mitigated through the avoidance and minimization measures and compensatory mitigation discussed below.

Avoidance, Minimization, and/or Mitigation Measures—This project will adhere to the MBTA, which recommends that unavoidable nesting habitat for Cooper's hawk, loggerhead shrike, and other protected bird species are removed in the non-nesting season between *October 1 and February 15*.

For migratory birds other than eagles and endangered or threatened species, a permit is not required to dislodge or destroy migratory bird nests that are not occupied by juveniles or eggs. However, any such destruction that results in take of any migratory bird is a violation of the MBTA (e.g., where juveniles still depend on the nest for survival). Because additional prohibitions of the BGEPA apply to eagle nests, no one may destroy or dislodge any eagle nest without a permit. The FESA (16 U.S.C. 1531-1544) prohibits destruction of nests of threatened and endangered migratory bird species.

In this way, impacts to birds protected by the MBTA will be minimized, but not avoided. If a golden eagle nest is found and avoidance is not possible, or if any Threatened or Endangered species nest is found, Caltrans will stop work and consult with USFWS before proceeding. Caltrans biology staff will conduct pre-construction nesting surveys to identify and remove nearby bird nests or to prevent nesting, as necessary. Caltrans will take additional reasonable measures to avoid and minimize unnecessary disruptions to the normal behavior patterns of protected bird species that include, but are not limited to, breeding, feeding, and sheltering.

To the extent practicable, shrub and tree trimming and/or removal activities associated with the project will be conducted from September through January, outside the nesting season (generally between February 1 and August 31).

If shrub and tree removal is scheduled to occur during the nesting season, a qualified wildlife biologist, familiar with the species and habitats in the BSA, will be retained to conduct preconstruction surveys for nesting birds within suitable nesting habitat in the BSA. The nesting bird surveys should be conducted within one week before

initiation of construction activities within those habitats. If no active nests are detected during surveys, construction may proceed.

If construction activities begin prior to the breeding season, construction can proceed until it is determined that an active migratory bird nest is subject to abandonment because of construction activities.

If construction activities are scheduled to occur during the breeding season, and if surveys indicate that migratory bird nests would be directly impacted by construction activities, a no-disturbance buffer will be established around the nest to avoid disturbance or destruction of the nest until after the breeding season or after a wildlife biologist determines that the young have fledged (usually late-June to August). The extent of these buffers will be determined by a wildlife biologist and will depend on the level of noise or construction disturbance, line of sight between the nest and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers.

Culverts will be inspected by a qualified biologist prior to the nesting season and any inactive nests will be dislodged or destroyed. After clearing the culverts of bird nests, bird exclusion netting will be installed to prevent birds (especially cliff swallows) from building new nests inside the culverts.

Because great blue herons habituate to non-threatening repeated activities, most studies recommend a minimum 300 m (984 ft) buffer zone from the periphery of colonies in which no human activity should take place during courtship and nesting seasons (February through August). This buffer will be maintained and the biological monitor, familiar with the species, will observe the rookery for disturbance. Construction activities will be halted if the rookery is likely to abandon nesting and the appropriate mitigation will be implemented. By implementing the general avoidance and minimization measures and the specific great blue heron rookery measure above, impacts to the great blue heron rookery will be avoided or minimized and is not expected to be a significant impact.

If active nests are identified on or immediately adjacent to the BSA, all non-essential construction activities (e.g., equipment storage, meetings) should be avoided in the immediate vicinity of the nest site; however, construction activities can proceed if the biological monitor has verified that the individual is not likely to abandon the nest

during construction. Construction disturbance will be temporary, and implementation of the avoidance and minimization measures described above will further minimize any effects on migratory birds. Indirect impacts may result from the loss of nesting habitat; however, replanting of vegetation will minimize impacts on potential nesting habitat (trees) within the BSA.

Compensatory Mitigation - Any bird nests that are identified during pre-construction nesting surveys will be removed in the non-nesting season to minimize impacts to nesting bird species to an insignificant level. If nests are found during the breeding season, implementation of the avoidance and minimization measures described above will minimize impacts. Through implementation of these measures, impacts to nesting birds, should any be identified during preconstruction surveys, will be reduced to below the level of significance and no further mitigation will be required.

Cumulative Impacts- The Table 2.3.1.4 projects have been evaluated for the cumulative impact assessment for the birds for the proposed project.

The Draft Subsequent EIR for the Montalcino at Napa Golf Course indicates the potential for nesting and non-nesting special status birds within that project site. Bird surveys conducted for that project reported the occurrence of merlin (SSC), white tailed kite (fully protected), and a possible vocalization of salt marsh common yellowthroat (SSC). Raptor and colonial nest removal would be mitigated to a less than significant level through the implementation of pre-construction nest surveys, and that if any nests were determined present, those trees would not be removed until the end of the nesting season.

These projects will incorporate similar avoidance, minimization, habitat creation and/or habitat preservation measures to mitigate their impacts to special status birds. By incorporating these and similar mitigation measures, significant cumulative impacts to special status birds are not anticipated.

Special-Status Animal Species: Bats

Two special-status species of bats are presumed present within the project BSA. The pallid bat (*Antrozous pallidus*) and Pacific western big-eared bat [*Corynorhinus* (=*Plecotus*) *townsendii townsendii*] are both SSC.

***Pallid Bat* (*Antrozous pallidus*)**

The pallid bat is a locally common species and occurs in lower elevations throughout California. This nocturnal mammal feeds on a wide variety of insects and arachnids, including beetles, grasshoppers, crickets, Jerusalem crickets (*Stenopelmatus fuscus*) moths, spiders, and scorpions. Their mating season ranges from late October to February, with young born from April to July. This species is very sensitive to disturbance of roosting sites, as these sites are essential for metabolic economy, juvenile growth, and as night roosts to consume prey. Pallid bat inhabits rocky, outcrop areas where they commonly roost in rock crevices, caves, and mine tunnels but they also roost in the attics of houses, under the eaves of barns, behind signs, in hollow trees.

***Pacific western big-eared bat [Corynorhinus(=Pecotus) townsendii townendsii*]**

The Pacific western big-eared bat is found throughout California. Most abundant in mesic habitats, this species is found in all but sub-alpine and alpine habitats, and may be observed during any season throughout its range. This species was once considered common in California, but is now considered uncommon throughout the state. This species feeds primarily on small moths, but beetles and a variety of soft-bodied insects also are consumed. Their mating season ranges from November to February, with young born in May and June. This species is extremely sensitive to disturbance of roosting sites, as a single visit may result in abandonment of the roost.

Impacts- Activities near culverts, trees, rock outcrops, structures, and other potential roosting habitat create a potential for disturbance to special-status bats, as would any avoidance and minimization measures to remove or restrict roosts, or to relocate any special-status bat. Implementation of the avoidance and minimization measures discussed below are expected to reduce, but not eliminate, project-related impacts to these species.

Avoidance, Minimization and/or Mitigation Measures—Because suitable habitat for special-status bat species may occur within currently inaccessible parcels, Caltrans biology staff will conduct pre-construction surveys to determine if roosts occur within the project footprint. Pre-construction surveys shall be conducted no more than fourteen days prior to tree removal and project construction to avoid loss of individuals or active roost sites, and may include removing or restricting access to potential special-status bat roost sites. If roost sites are determined to be present within the project area and avoidance is not possible, a bat specialist will be consulted

to identify appropriate protection measures, which may include non-disturbance buffers to protect roost sites, exclusion from roost sites, or removal of unoccupied roost sites, thereby minimizing impacts to these species. Roost removal or relocation of a state species of concern associated with this project will require a letter of authorization from the CDFG Region 3 Office. Caltrans will take additional reasonable measures to avoid and minimize unnecessary disruptions to the normal behavior patterns of special-status bats, which include, but are not limited to, breeding, feeding, and sheltering.

Compensatory Mitigation - Any bat roost that is identified during pre-construction surveys will be restricted or removed, and any special-status bat that is encountered during project related activities would be relocated to minimize impacts to special-status bat species. If any roost sites are removed or restricted, or if special-status bat species are relocated or otherwise affected by project activities, the appropriate compensatory mitigation will be developed and implemented, and would include the construction and placement of bat boxes or other suitable roost structures.

Cumulative Impacts- The Table 2.3.1.4 projects, as discussed below, will incorporate similar avoidance, minimization, and compensation to mitigate impacts to special status bat species. By incorporating these and similar mitigation measures, significant cumulative impacts to special status bat species are not anticipated.

The DSEIR for the Montalcino at Napa Golf Course states that a bat habitat assessment was conducted for the Devlin Road Extension project area, and while some potential roost habitat was observed, no roosting bats or bat signs were documented. A significant impact to special-status bats may occur from removal of snags and structures, and Mitigation Measure 5.2-18 in that document provides that snags and structures will not be removed during the maternity season (June-August); however, if removal must be conducted during this period then pre-construction surveys will be conducted to determine the presence or absence of these species. If pre-construction surveys determine presence, then a qualified biologist will remove bats using standard non-invasive exclusion methods. Implementation of this measure would reduce impacts to a less than significant level.

The IS/PMND for the North Connector project states, “Suitable roosting habitat for (pallid) bat occurs on cliffs in the West End of the study area north of SR12, although these cliffs would not be impacted by the proposed project. In general, trees in the

area of impact do not provide suitable roosting or nesting cavities. Regardless, preconstruction surveys would be conducted before trees or potential roost structures are impacted or removed within the study area."

The IS/PMND determines that impacts to occupied roost trees or structures would be considered potentially adverse. Mitigation measures include preconstruction surveys before trees or potential roost structures are impacted or removed and tree removal and structure demolition work one month of the survey. If a maternity colony is observed, no eviction/exclusion should be allowed during the maternity season, and if a non-reproductive group of bats are found within a building or roost tree, they should be evicted and excluded from the roost site prior to work activities. Implementation of these measures is expected to mitigate impacts to a less than significant level.

2.3.5. Threatened and Endangered Species

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 CFR Part 402. This act and subsequent 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, are required to consult with the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NOAA Fisheries) to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 is a Biological Opinion or an incidental take permit. Section 3 of FESA defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level, the California Endangered Species Act (CESA), California Fish and Game Code, Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats. The California Department of Fish and Game (CDFG) 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 CDFG. For projects requiring a Biological Opinion under Section 7 of the FESA, CDFG may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

The discussions of the endangered species for the proposed project are discussed below.

Federally-listed plant species

Affected Environment- *Contra Costa goldfields* is federally listed, spring annual herb that blooms from March to June. This species has not been identified within the project BSA; however, suitable habitat does occur on parcels where access was not granted to conduct surveys. This plant is endangered. The nearest known CNDDB record of the Contra Costa goldfields is from Suscol Ridge, about four miles south of Napa, approximately 0.80 km (0.5 mi) north of the northwest end of the BSA.

Showy Indian clover is another annual plant that blooms from April to June found in Solano County, west and north to Marin and Sonoma Counties. Showy Indian clover is very rare and the micro-habitat requirements for this species are not well known. Potentially suitable habitat for showy Indian clover (low, wet swales, grasslands, and grassy hillsides) does occur within the BSA in areas that have not yet been surveyed for rare plants. However, the species is extremely endangered, and it is very unlikely to occur. Therefore, it is inferred to be absent in areas of unsurveyed suitable habitat within the BSA.

Both of the federally listed species are not expected to occur within the BSA based on field surveys and habitat assessments conducted to date. A preconstruction survey will be followed by Caltrans staff.

Impacts- As described earlier, access limitations prevent conclusive determination of the extent of potential project-related impacts to federally-listed plant species. However, the surveys that were done in the area where Caltrans staff had access, indicated that it is very highly unlikely that these species would occur in the proposed project BSA.

Avoidance, Minimization, and/or Mitigation Measures—If a preconstruction survey finds these species in the project BSA, the following measures will be taken by Caltrans.

1. Making minor design modifications to avoid impacts to the species;
2. Designating any federally-listed plants and/or populations observed within the temporary work area as an ESA with orange construction fencing and placement of signage to avoid the ESA;
3. Showing the location of all ESAs on project construction drawings and monitoring them during construction.
4. Implementing reasonable and prudent measures to minimize and avoid take of listed species for permanent impacts to suitable habitat or individual plants.

Cumulative Impacts- Should rare plants be observed during future surveys within the proposed project and result in significant rare plant impacts, mitigation will be implemented. Impacts, should any be identified, will be less than significant after mitigation is implemented. Therefore, no significant cumulative impacts are anticipated to rare plant resources from the SRs 29/12 interchange and the projects listed above. Therefore, the project is not expected to have a significant contribution to any potential cumulative impacts to federally listed plants. Projects included in this cumulative impact analysis include the projects shown in 2.3.1.4.

Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpool shrimp: *federally-listed large branchiopods*
(*Branchinecta conservatio, Branchinecta lynchii, and Lepidurus packardi*)

Affected Environment- The Conservancy fairy shrimp (*Branchinecta conservatio*) and vernal pool tadpole shrimp (*Lepidurus packardi*) are federally endangered (FE) species, and the vernal pool fairy shrimp (*Branchinecta lynchii*) is a federally threatened (FT) species that are protected under the federal Endangered Species Act (FESA). A dry season survey of potential large branchiopod habitat was completed in November 2006 and a wet season survey was completed in June of 2007.

A total of 140 basins occurring in the BSA were evaluated for their potential to support federally-listed large branchiopods during preliminary site surveys. Eighty of these basins occur to which access was granted, twenty-six basins were determined not to provide habitat to federally-listed large branchiopods, forty-one basins were considered potential large branchiopod habitat and were dry-season sampled, and 13 basins were determined to provide possible or unknown habitat for federally-listed

large branchiopods. Thirty-seven of the forty-one sampled potential habitat basins and three of the thirteen possible or unknown habitat basins occur near the SRs 29/12 interchange. These areas have been evaluated and sampled as appropriate in the dry season 2007 and in the wet season 2006-2007.

Impacts- Protocol level surveys to accessible parcels were completed in July 2007. No branchiopods were identified. The federally-listed large branchiopod species occurrence is inferred in inaccessible and unsurveyed potential habitat basins. Depending on whether the Tight Diamond or the Single Point alternative is chosen, between 12.09-12.14 acres of permanent impacts to inaccessible and unsurveyed potential habitat basins will occur.

Avoidance, Minimization and/or Mitigation Measures—Standard minimization efforts to be implemented would include elements of the following to avoid and minimize project-related impacts:

1. Design modifications that may allow Caltrans to avoid the species and reduce the impact below the level of significance.
2. To the maximum extent practicable, avoidance of all construction activities in the temporary work area with federally -listed large branchiopod habitat. Any identified federally listed large branchiopod habitat within the temporary work area will be designated as an ESA and protected with appropriate fencing and signage. All ESAs will be shown on the final construction drawings.
3. Performance of all work in accordance with a Storm Water Pollution Prevention Plan (SWPPP). Best Management Practices (BMPs) will be implemented and may include the use of silt fences, sandbags, detention basins, and other means as appropriate to prevent erosion into any identified federally-listed large branchiopod habitat.
4. Restoration of the topography and grade to preconstruction conditions in vernal pool areas that are temporarily affected. Following all grading and earthwork, these areas will be either be replanted or reseeded with the appropriate plant species, if determined necessary, or monitored following construction, to determine that vegetation comparable to the pre-existing condition has naturally regenerated.
5. Tallying of unavoidable vernal pool losses during construction and incorporating into project permits and compensatory mitigation documents and requirements as appropriate. Compensatory mitigation is described below.

Since project-related impacts are currently undetermined, no compensatory mitigation for impacts to federally-listed large branchiopod has been identified. However, access has been obtained to only sixty-nine of 125 total parcels within the BSA, and surveys will therefore not exclude the potential for federally-listed large branchiopods to occur within unsurveyed potential habitat. If federally-listed large branchiopods are determined to be impacted by the project, then appropriate compensatory mitigation will be developed and implemented in coordination with the appropriate resource agencies.

To mitigate the potential permanent impacts of the proposed project on listed branchiopods, Caltrans would purchase approximately 13.35 acres of vernal pool construction and/or vernal pool preservation credits. This vernal pool preservation and creation would constitute adequate compensation for adverse effects to branchiopod species. This compensation would include:

1. Purchase of mitigation credits at an existing bank or banks, or
2. Purchase and preservation of a parcel with suitable habitat submitted to the USFWS for approval, or
3. A combination of these two approaches.

Cumulative Impacts- No impacts to federally-listed large branchiopods were identified as part of the above projects. The Napa County Airport Specific Plan and EIR did not specifically include protocol level surveys for federally-listed large branchiopods, however that document states:

"Vernal pools could be destroyed by development in the grassland area. Any rare or endangered species present in the pools would also be eliminated (sic) surveys for vernal pools and rare or endangered plants associated with vernal pools should be done in spring and early summer; apparently no surveys have been done in the project area. The potential for adverse effects on rare or endangered species cannot be predicted, but suitable habitat for these species is present. The loss of vernal pools would be an adverse impact regardless of the presence or absence of rare of endangered plants."

Potential impacts to federally-listed large branchiopods therefore could occur within the Napa County Airport Specific Plan Area; however, these impacts will be mitigated. No other significant impacts to federally-listed large branchiopods are predicted to occur as part of the remaining projects, listed above.

California Red-legged Frog (CRLF)

Affected Environment- The CRLF is a federally threatened species with protection under the FESA by USFWS and CDFG. This species is a pond-dwelling amphibians that generally live near permanent aquatic habitats including livestock ponds and pools in perennial streams. The optimal habitat is characterized by dense, shrubby riparian vegetation associated with deep, still, or slow-moving water. The shrubby riparian vegetation that structurally seems to be most suitable for this frog is that provided by arroyo willow, although cattails (*Typha* spp.) and bulrushes (*Scirpus* spp.) also can provide suitable habitat. Although CRLFs are found in ephemeral streams and ponds, populations cannot be maintained where all surface water disappears.

There are two occurrences of CRLF documented within 1.6 km (1 mi) of the project BSA. These are recorded in the CNDDB at both locations are north of SR 12 and documented within the last three years. Occurrence was in a drainage containing small plunge pools and surrounded by grassland. Another occurrence is located in a pond/freshwater marsh dominated by cattails. Beyond 1.6 km (1 mi) from the project BSA, the CNDDB denotes nine additional occurrences within an 8 km (5 mi) radius of the project BSA. Each of these additional occurrences is located more than 3.2 km (2 mi) south of the study area and, all but one , are separated from the project BSA by I-80. SR 29 separates these occurrences from potential CRLF habitat west of SR 29 in the project BSA, which includes the high-quality habitat in the western reach of Sheehy Creek.

All of the seven perennial creeks identified within the project BSA were surveyed; however, Fagan Creek south of SR 12 was not visible from the roadway and could not be accessed. For comparison purposes, biologists surveyed a reach of Fagan Creek just downstream and west of the reach within the BSA. Results of this survey allowed Caltrans biologists to approximate current conditions of Fagan Creek within the BSA. Numerous ephemeral drainages occur in the project BSA that dry up before August in most years, and therefore do not provide breeding habitat for CRLF.

The BSA contains unsuitable upland habitats, suitable upland or movement corridor habitat, suitable aquatic dispersal habitat, and suitable aquatic breeding habitat for CRLF. The suitable upland habitat in the BSA consists of mixed grasslands and oak woodlands within 1.6 km (one mile) of potential breeding habitat which is present ion

project BSA. Although direct observations were not possible throughout the project BSA, indirect observations from adjacent accessible parcels and aerial photo interpretation were used to determine the location and extent of suitable CRLF habitat within inaccessible portions of the BSA. CRLF presence is inferred in locations that could not be accessed but where suitable habitat was determined to occur based on indirect observations.

Impacts- There is potential for project activities to disrupt movement or cause entrapment, harassment, and mortality to CRLF. The implementation of measures described below will minimize the potential for impacts to CRLF. However, the proximity of the project to known CRLF occurrences and the presence of suitable habitat throughout the project area will require formal Section 7 consultation with USFWS. A Biological Assessment (BA) is scheduled for submission to the USFWS in July 2007 that will initiate formal consultation for CRLF.

Avoidance, Minimization and/or Mitigation Measures—On April 1, 2003, a field meeting with USFWS Coast Bay-Delta Branch Chief Dan Buford determined that project activities east of the SRs 29/12 interchange would not affect the CRLF if seasonal restraints, avoidance of seasonal wetlands, and other avoidance measures were in place during project activities.

To avoid and minimize impacts to CRLF the following measures will be used:

1. Work in ephemeral drainages and seasonal wetlands will be restricted until the summer and/or early autumn months (June 15 through October 15).
2. ESA fencing will be installed and storm water BMPs implemented to avoid project-related impacts to CRLF habitat.
3. Caltrans biology staff will conduct pre-construction surveys for CRLF prior to the start of any construction activities in or near suitable habitat.
4. If CRLF are observed during pre-construction surveys, construction activities will be stopped and the CRLF will be relocated by a permitted biologist.
5. Creek and riparian impact avoidance and minimization measures, and on-site restoration of temporarily disturbed areas, as described in Section 2.3.2, will further minimize impacts to the CRLF.

Compensatory Mitigation- Compensatory mitigation for temporary impacts to combined aquatic habitat are proposed at 1.1:1. At this ratio, offsite mitigation at 0.1:1 would require 0.26 ha (0.65 ac), for the Tight Diamond Alternative and 0.25 ha

(0.61 ac) for the Single-Point Alternative. An additional 2.64 ha (6.51 ac) or 2.49 ha (6.15 ac) will be restored onsite at the ratio of 1:1 for temporary impacts to CRLF combined aquatic habitat.Temporary disturbance to CRLF upland dispersal habitat will be mitigated through restoration of on-site habitats as described in Section 2.3.3.

To mitigate the potential permanent impacts of the proposed project to CRLF, Caltrans would purchase a combined total habitat of at least 57.87 ha (143.00 ac). This total would include 52.47 ha (129.65 ac) of upland habitat credits and 5.14 ha (12.70 ac) of wetland construction and/or wetland preservation credits. This upland preservation and wetland preservation and creation would constitute adequate compensation for adverse effects to CRLF.

This compensation would include:
1. Purchase of mitigation credits at an existing bank or banks, or
2.Purchase and preservation of a parcel with suitable habitat submitted to the USFWS for approval, or
3.A combination of these two approaches.

Caltrans has considered purchasing and conserving land as compensatory mitigation that may support CRLF. Additional mitigation opportunities may be available with the Solano Land Trust south of the project in Lynch Canyon, or through established or future mitigation banks.

Cumulative Impacts- While no CRLF have been documented within the project BSA, reported occurrences within 1.6 km (1 mi) of the project BSA and the presence of suitable aquatic breeding habitat and aquatic and upland movement/aestivation habitat within the BSA suggest the likelihood of CRLF within the BSA. Moreover, surveys did not include all potential habitat since not all areas could be accessed; therefore impacts to CRLF cannot be ruled out.

The geographic scope of the project vicinity for the cumulative impact analysis is defined as an area within 0.4 km (0.25 mile) of the footprint of the SRs 29/12 interchange and the SR 12 Jameson Canyon Road widening project.

These projects will incorporate similar avoidance, minimization, habitat creation and/or habitat preservation measures to mitigate their impacts to CRLF.

Incorporating these measures and similar mitigation measures, significant cumulative impacts to CRLF are not anticipated.
The Draft Subsequent EIR for the Montalcino at Napa Golf Course states that protocol-level CRLF surveys were conducted but that no CRLF were encountered. The presence of breeding CRLF was determined unlikely given the shallow and seasonal nature of the aquatic habitat.

The Red Top Road Truck Climbing Lane project NES states that ephemeral drainages in the area of that project may assist in the dispersal of CRLF and that a seasonal pond determined to be potential habitat may be affected by one of the design options; however, due to the implementation of seasonal work restrictions minimal impacts to CRLF will occur.

The I-80 North Connector project IS/PMND with EA reports that biologists observed CRLF in a drainage feature on the West End of the project area on multiple occasions and that CRLF are assumed to be present throughout the West End of the project area. Construction of the project could result in impacts to CRLF and/or its habitat and that these impacts would be considered an adverse effect. Approximately 0.24 ha (0.59-acre) of seasonal wetlands and seeps at the West End of the project area will be affected by the proposed project; however, these impacts will be mitigated by the creation of a 0.6 ha (1.5 acre) pond and the dedication of 4.4 ha (10.8) acres of mitigation land within an open space preserve, thereby reducing the impacts to a less than significant level.

Mitigation for impacts to CRLF habitat will be implemented as discussed above which will reduce CRLF impacts to a less than significant level after mitigation. Therefore, no significant cumulative impacts are anticipated to CRLF resources from the SR 12 Jameson Canyon widening and SRs 29/12 interchange project and the projects discussed for cumulative impact assessment.

2.3.6. Invasive species

Regulatory Setting: On February 3, 1999, President Clinton signed Executive Order 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 guidance issued August 10, 1999 directs the use of the state's noxious weed list to define the invasive plants that must be considered as part of the NEPA analysis for a proposed project.

Invasive Plant Species

Affected Environment- Invasive plant species within the BSA are defined as species of plants included on lists prepared by the California Department of Food and Agriculture (CDFA), and invasive plants identified by the California Invasive Plant Council (Cal-IPC). Cal-IPC focuses on plant species that impact natural areas, sometimes called "wildland weeds" (Cal-IPC, 2007). The state laws implemented by the CDFA are found in the CDFA Code, which defines a 'noxious weed' to be any species of plant that is, or is liable to be, troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, which the director, by regulation, designates to be a noxious weed.

Information on invasive plant species is tracked by these agencies because invasive plants can significantly degrade wildlife habitat. According to the Cal-IPC, nationally, invasive species are the second-greatest threat to endangered species, after habitat destruction (Cal-IPC, 2007). The project BSA contains numerous plant species considered to be invasive species of varying severity. A list of all CDFA and Cal-IPC ranked invasive plant species.

Numerous invasive plant species occur scattered throughout the project BSA. The grassland and ruderal habitats that are adjacent to the active roadway support the highest number of invasive plants. Invasive Plant were observed during 2006 Rare Plant Surveys of the BSA. Sixty-two invasive species observed within the project BSA during the 2006 rare plant surveys and their corresponding Cal-IPC and CDFA ranks. Five of these invasive species are ranked a 1 or "high" by the Cal-IPC, in terms of overall threat. However, these species are all extremely widespread throughout significant portions of California and are not unique to the project region.

Impacts- Most of the habitats within the project BSA have been already directly or indirectly disturbed over the long-term by roadway construction and traffic as well as agricultural practices and development in the project region. A total of sixty-two invasive plant species were identified during the 2006 rare plant surveys. Because invasive species are already so widespread, the chance that construction of the

proposed project could result in the introduction of new invasive plants or spread existing invasive species into portions of the BSA in which invasive species do not already occur is small. However, it is possible that construction could cause the spread of invasive species already occurring, or the introduction of new invasive species. This could be considered a significant impact, depending on species-specific characteristics of the particular invasive species introduced or spread. For example, if an "A" ranked – CDFA species were introduced, this would be of serious concern and would require the immediate attention and action of the CDFA. Therefore, measures to avoid and minimize the potential for the introduction of new invasive plants or the spread of existing plants will be implemented during construction. These measures are described below.

Avoidance, Minimization and/or Mitigation Measures—Caltrans will implement the following protection measures:

- Prior to project construction, Caltrans will conduct surveys within the project area for invasive species of highest concern and the preconstruction weed surveys will be mapped.
- Caltrans will not allow disposal of soil and plant materials from any areas that support CDFA List A or Cal-IPC List 1 invasive species into natural habitats such as coast live oak woodland, coast live oak-willow riparian forest, or within or directly adjacent to wetlands or other waters.
- Erosion control species will be certified "weed free" to reduce the chances of introducing a new invasive species to the project BSA, or spreading an existing invasive species into unoccupied areas. Additionally, only non-invasive native and/or non-native species will be used for erosion control or landscaping.

If CDFA List A plants are identified during future surveys, or another invasive habitat threat is identified (e.g., such as the sudden oak death fungal pathogen), all construction equipment shall be pressure washed or steam cleaned prior to initial entry to the project limits. Additionally, other measures as required by CDFA or other agencies may be required to prevent the spread of pathogens or invasive plants.

Cumulative Impacts- Should an invasive plant be observed during future surveys within the BSA, mitigation measures as described above will be implemented. With implementation of mitigation measures, impacts to natural habitats due to invasive weeds, should any be identified, will be less than significant after mitigation is

implemented. No significant cumulative impacts are anticipated due to invasive weed species from the SRs 29/12 project and the projects included in the scope of the cumulative impacts analysis. Therefore, the project is not expected to have a significant contribution to any potential cumulative impacts to invasive species.

2.4 Construction Impacts

Affected Environment- During the SR 12 widening, it is anticipated that there will be two main construction stages. Stage 1 will be the construction of two lanes and shoulders for the EB direction and retaining walls. Stage 2 will be the widening and overlaying of existing highway. On SR 12, two lanes, one lane for both WB and EB, will be maintained throughout construction. For the SR 29/12 interchange segment, SR 29 would be maintained as a four-lane highway. A temporary detour for SR 12 will be built between Kelly Road and Airport Boulevard in order to elevate SR 12 over SR 29 and construct it at its proposed alignment.

Impacts- During the construction associated with the proposed project, emergency response vehicles and utilities may be affected by lane closures, unforeseen delays, or construction activities.

Utility relocations have been identified within the project footprint and will be relocated as necessary to construct either of the build alternatives. All utility relocations will be within the environmental footprint of the proposed project. The potential impacts due to relocation of utilities have already been taken into account in the environmental studies.

Construction staging and storage will occur within the project footprint and have been studied as part of the environmental process. Unsightly material and equipment storage shall not be visible within the foreground of the highway, or visually screened where required. In addition, all areas disturbed by construction, staging and storage shall be revegetated immediately following completion construction.

Avoidance, Minimization, and/or Mitigation Measures—A Transportation Management Plan (TMP) will be required for this project. The TMP is a special program that is implemented during construction to minimize and prevent delay and inconvenience to emergency response vehicles and the traveling public. The proposed construction and improvements can include temporary roadwork, which require lane closures or detouring.

The TMP for this project will be developed and refined during the final design phases, supported by detailed traffic studies to evaluate traffic operations. The need for necessary lane closures during off-peak hours or at night, or short–term detour routes, will be identified as required. The TMP typically will include press releases to notify and inform motorists, businesses, community groups, local entities, and elected officials of upcoming closures or detours. Various TMP elements, such as portable Changeable Message Signs and California Highway Patrol Construction Zone Enhanced Enforcement Program may be utilized to alleviate and minimize delay to the traveling public. The TMP will also serve to notify all emergency service providers in the project corridor of the project construction schedule, lane closures, and detours. Utilities located within the project corridor will be identified before construction and relocated, if required.

2.5 Climate Change (CEQA)

Regulatory Setting: While climate change has been a concern since at least 1988, as evidenced by the establishment of the United Nations and World Meteorological Organization's Intergovernmental Panel on Climate Change (IPCC), the efforts devoted to greenhouse gas[1] (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. In 2002, with the passage of Assembly Bill 1493 (AB 1493), California launched an innovative and pro-active approach to dealing with GHG emissions and climate change at the state level. AB 1493 requires the Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions; these regulations will apply to automobiles and light trucks beginning with the 2009 model year.

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

[1] Greenhouse gases related to human activity include: Carbon dioxide, Methane, Nitrous oxide, Tetrafluoromethane, Hexafluoroethane, Sulfur hexafluoride, HFC-23, HFC-134a*, and HFC-152a*.

S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

Climate change and GHG reduction is also a concern at the federal level; however, at this time, no legislation or regulations have been enacted specifically addressing GHG emissions reductions and climate change.

Affected Environment: "According to a recent white paper by the Association of Environmental Professionals[2], "an individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Global climate change is a cumulative impact; a project participates in this potential impact through its incremental contribution combined with the cumulative increase of all other sources of greenhouse gases.

The Department and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 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 (December 2006).

One of the main strategies in the Department's Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph. Relieving congestion by enhancing operations and improving travel times in high congestion travel corridors will lead to an overall reduction in GHG emissions. "

The proposed project's purpose is to relieve congestion and improve traffic operations. Section 2.1.6 of this Initial Study/Environmental Assessment showed that under the No Build scenario, traffic operations on SR 12 in the year 2035 will be Level of Service (LOS) "F" or "E" in all segments during the AM and PM peak hours. The traffic operations for the SRs 29/12 intersection in the year 2035 will also be LOS "F." Under either of the Build alternatives, the traffic operations for SR 12 and the SRs 29/12 interchange will be LOS "C" or "D."

[2] Hendrix, Micheal and Wilson, Cori. *Recommendations by the Association of Environmental Professionals (AEP) on How to Analyze Greenhouse Gas Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), p. 2.

The Department recognizes the concern that carbon dioxide emissions raise for climate change. However, modeling and gauging the impacts associated with an increase in GHG emissions levels, including carbon dioxide, at the project level is not currently possible. No federal, state or regional regulatory agency has provided methodology or criteria for GHG emission and climate change impact analysis. Therefore, the Department is unable to provide a scientific or regulatory based conclusion regarding whether the project's contribution to climate change is cumulatively considerable.

The Department continues to be actively involved on the Governor's Climate Action Team as ARB works to implement AB 1493 and AB 32. As part of the Climate Action Program at Caltrans (December 2006), 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 is working closely with local jurisdictions on planning activities; however, the Department does not have local land use planning authority. The Department is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks. However it is important to note that the control of the fuel economy standards is held by the United States Environmental Protection Agency and ARB. Lastly, the use of alternative fuels is also being considered; the Department is participating in funding for alternative fuel research at the University of California Davis.