Chapter 3 California Environmental Quality Act Evaluation

3.1 Determining Significance under the California Environmental Quality Act

The proposed project is a joint project by the Caltrans and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. FHWA's responsibility for environmental review, consultation, and any other action required in accordance with the NEPA and other applicable federal laws for this project is being, or has been, carried out by Caltrans under its assumption of responsibility pursuant to 23 U.S. Code 327. Caltrans is the lead agency under the CEQA and the NEPA.

One of the primary differences between the NEPA and the CEQA is the way significance is determined.

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

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

3.2 Discussion of Significant Impacts

3.2.1 Impacts Mitigated to a Less Than Significant Level

Aesthetics – Less than Significant Impact with Mitigation

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

The removal of vegetation and construction of flyover and retaining walls could have a negative impact on the visual environment, however, with the proposed mitigation; the replanting of disturbed areas and 19 acres of new trees, shrubs and irrigation will be installed between the property line and the new auxiliary lanes, the proposed project will result in "less than significant with mitigation" visual effects. Avoidance, minimization and mitigation measures are summarized in Section 3.6.

Biological Resources – Less than Significant Impact with Mitigation

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

The proposed project will temporarily impact 3.83 acres and permanently impact 1.76 acres of giant garter snake upland habitat. The project will not impact any giant garter snake aquatic habitat. The areas of upland habitat that the proposed project will impact are ruderal grasslands between the Natomas drainage canals and I-5 and I-80. Avoidance, minimization, and mitigation measures are summarized in Section 2.26.9.

No Swainson's hawk's nests were observed within the ESL though there are two known nest trees within a quarter mile of the ESL. 9.85 acres of foraging habitat is will be permanently impacted by the project.

Avoidance measures include designing the project for the minimum footprint necessary.

Compensatory mitigation for impacts to Swainson's hawk foraging habitat will follow the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (DFG, 1994). As outlined in this document, impacts to foraging habitat shall be mitigated for at a 1:1 ratio for impacts within one mile of an active nest. Impacts are currently estimated at 9.85 acres within one mile of an active nest. Based on these amounts, 9.85 acres of Swainson's hawk foraging habitat mitigation will be needed. More details of Swainson's hawk avoidance, minimization, and mitigation measures are provided in Section 2.26.5.

3.2.1.1 Unavoidable Significant Environmental Effects

The proposed project would not result in any unavoidable significant environmental impacts.

3.3 CEQA Noise Analysis

The Caltrans Noise Protocol states that a traffic noise impact may be considered significant under CEQA if the project is predicted to result in a substantial increase in traffic noise. When determining whether a noise impact is significant under CEQA, the baseline noise level and the build noise level are compared. The CEQA noise analysis is completely independent of the NEPA-23 CFR 772 analysis discussed in Chapter 2, which is centered on noise abatement criteria. Under CEQA, the assessment entails looking at the setting of the noise impact and then how large or perceptible any noise increase would be in the given area. Key considerations include: the uniqueness of the setting, the sensitive nature of the noise receptors, the magnitude of the noise increase, the number of residences affected and the absolute noise level.

The results of the noise modeling assessment indicate that project will result in increase of 1 to 2 dB throughout the study area which is barely perceptible to the human ear. The traffic noise impacts of the proposed project are therefore not considered significant under CEQA.

3.4 CEQA Air Analysis

Local and Regional Implementation of Federal Requirements

The air quality management agencies of direct importance in Sacramento County include the U.S. Environmental Protection Agency (EPA), Air Resources Board (ARB), and the Sacramento Metropolitan Air Quality Management District (SMAQMD). The EPA has established federal standards for which the ARB and SMAQMD have primary implementation responsibility. The ARB and SMAQMD are responsible for ensuring that state standards are met. The SMAQMD is responsible for implementing strategies for air quality improvement and recommending mitigation measures for new growth and development. At the local level, air quality is managed through land use and development planning practices, which are implemented in Sacramento County through the general planning process. The SMAQMD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws.

The SMAQMD has specified significance thresholds within its *Guide for Air Quality Assessment in Sacramento County* (Sacramento Metropolitan Air Quality Management District 2004) to determine air quality impacts for projects located within the Sacramento Valley Air Basin (SVAB). SMAQMD's thresholds of significance, as indicated in their guide are summarized in Table 29.

Table 29 Sacramento Metropolitan Air Quality Management District Thresholds of Significance

	Ozone Precursor Emissions			
	ROG (pounds per day)	NO_x (pounds per day)	CO	PM_{10}
Construction (short-term)	None	85	CAAQS[a]	CAAQS[a]
Operational (long-term)	65	65	CAAQS[a]	CAAQS[a]

[a] California Ambient Air Quality Standards (CAAQS)

A project that may cause an exceedance of a state air quality standard, or may make a substantial contribution to an existing exceedance of an air quality standard will have a significant adverse air quality impact. "Substantial" is defined as making measurably worse, which is 5% or more of an existing exceedance of a state ambient air quality standard.

Source: Sacramento Metropolitan Air Quality Management District 2004

For the assessment of significant impacts from construction-related emissions of particulate matter, the SMAQMD has established screening levels based on a project's maximum actively disturbed area. Based on the maximum area disturbed, the SMAQMD recommends mitigation measures that would reduce particulate matter emissions to a less-than-significant level. Table 30 summarizes the mitigation measures the SMAQMD recommends for various project sizes.

Table 30 Sacramento Metropolitan Air Quality Management District Particulate Matter Screening Levels for Construction Projects

Screening Level	Mitigation
5 acres and below	No mitigation required
5.1 – 8 acres	Level One Mitigation Required: Water exposed soil twice daily. Maintain 2 feet of freeboard space on haul trucks.
8.1 – 12 acres	Level Two Mitigation Required: Water exposed soil three times daily. Water soil piles three times daily Maintain 2 feet of freeboard space on haul trucks.
12.1 – 15 acres	Level Three Mitigation Required: Keep soil moist at all times. Maintain 2 feet of freeboard space on haul trucks. Use emulsified diesel or diesel catalysts on applicable heavy-duty diesel construction equipment.

Source: Sacramento Metropolitan Air Quality Management District 2004

3.4.1 Project Conformity with Local and Regional Plans

As discussed in Section 2.19 of this document, the proposed project is included in the Metropolitan Transportation Plan (MTP) 2035, which was found to conform and adopted by the Sacramento Area Council of Governments (SACOG) on March 20, 2008. FHWA and the Federal Transit Administration (FTA) adopted the air quality conformity finding on May 16, 2008. The project is also included in the financially constrained 2009/2012 Metropolitan Transportation Improvement Plan (MTIP) (Amendment 7), page 56. The MTIP was found to conform by FHWA and the Federal Transit Administration (FTA) on 08/21/2008. The design concept and scope of the proposed project is consistent with the project description in the MTP 2035, the 2009/2012 MTIP (Amendment 7), and the assumptions in SACOG's regional emissions analysis.

Further, a project level conformity analysis shows that the project will conform with the State Implementation Plan (SIP), including the localized impact analysis for CO and PM10 required by 40 CFR 93.116 and 93.123. This project is not considered a Project of Air Quality Concern regarding particulate matter (PM10) as defined in 40 CFR 93.123 (b)(1) and meets the requirements of the Clean Air Act and 40 CFR 93.116, therefore an explicit PM10 hot-spot analysis is not required (SACOG Regional Planning Partnership, Minutes February 25, 2009).

With regard to short-term construction impacts and SMAQMD's suggested mitigation, Caltrans does not, at this time, have the authority to require the use of specific types of equipment or other direct restrictions on contractor equipment fleet emissions. However, the Contractor is required to comply with Caltrans Standard Specifications Section 14-9.01 and Section 10 of Caltrans Standard Specifications (2006). Section 7, "Legal Relations and Responsibility," addresses the Contractor's responsibility on many items of concern, such as: air pollution; protection of lakes, streams, reservoirs, and other water bodies; use of pesticides; safety; sanitation; convenience of the public; and damage or injury to any person or property as a result of any construction operation. Section 14-9.01 specifically requires compliance by the Contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. Section 10 requires dust control. If dust palliative materials other than water are to be used, material specifications are contained in Section 2.19.4. Should a SMAQMD permit be required for construction, the Contractor shall be responsible for meeting all permit requirements.

The proposed project's effects to air quality will be less than significant.

Mobile Source Air Toxics (MSAT) Emissions

Mobile source air toxics (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 toxic also results from engine wear or from impurities in oil or gasoline. The six air toxics labeled by the USEPA as priority transportation MSATs are benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attributable to MSAT exposure associated with a proposed action. This EIR/EA 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 EIR/EA. Due to these limitations, see Appendix D for a discussion regarding incomplete or unavailable information in accordance with CEQ regulations (40 CFR Section 1502.22[b]).

Table 31 presents Average Annual Daily Traffic (AADT) volumes on I-5 and I-80 for 2006, 2020, 2030, and 2040 conditions. The volumes indicate that the AADT on I-5 and I-80 is currently in excess of 125,000 and is projected to increase in future years.

Table 31 I-5 and I-80 ADT Volumes

	From	To	2006 Daily Traffic Count	Base year Model	No Project Scenario				Plus Project Scenario			
					Unadjusted Forecast	Forecasts			Unadjusted Forecast	Forecasts		
					2035	2040	2030	2020	2035	2040	2030	2020
I-5	South	Garden Highway	188,000	184,438	287,714	337,260	300,780	239,640	291,135	341,670	303,950	241,350
	Garden Highway	W. El Camino	175,000	171,969	256,116	299,340	269,470	217,080	263,133	305,300	272,710	220,590
	W. El Camino	I-80	160,000	148,769	260,117	315,220	276,050	215,680	269,802	321,990	278,850	220,520
	I-80	Arena Boulevard	139,000	127,629	218,642	262,340	229,910	184,510	222,775	261,220	228,030	186,580
	Arena Boulevard	Del Paso Road	127,000	107,557	192,793	239,600	211,740	169,620	195,367	241,610	211,380	170,910
	Del Paso Road	SR 99	103,000	98,425	185,501	210,730	181,830	146,540	186,265	211,830	181,100	146,920
	SR 99	Power Line Road	79,000	77,985	129,789	141,820	124,020	104,910	130,053	142,920	123,480	105,040
	Power Line Road	Airport Road	79,000	77,985	108,394	116,220	105,440	94,210	108,459	115,890	105,350	94,240
	Airport Road	North	53,000	63,779	91,648	86,820	77,030	66,940	91,597	86,460	76,880	66,910
I-80	West	W. El Camino	188,000	74,055	126,743	247,020	235,160	214,350	127,507	252,260	234,960	214,730
	W. El Camino	I-5	175,000	67,173	109,791	222,520	213,470	196,310	111,929	228,940	214, 510	197,380
	I-5	Truxel	160,000	115,900	188,362	249,540	229,600	196,240	194,167	262,480	235,440	199,140
	Truxel	Northgate Boulevard	139,000	111,091	169,941	213,650	194,670	168,430	173,234	219,650	197,890	170,080
	Northgate Boulevard	Norwood Avenue	127,000	123,994	179,629	196,340	177,340	154,820	182,110	200,040	180,050	156,060
	Norwood Avenue	East	103,000	124,629	176,911	167,790	149,940	129,150	179,035	170,950	152,240	130,210

Source: Fehr & Peers 2008a

Table 32 presents modeled MSAT emissions. The differences in emissions between with- and without-project conditions represent emissions generated directly as a result of implementation of the proposed project. To represent a worst-case scenario, traffic along I-5 south of Garden Highway was modeled, as this segment has the highest AADT in the project study area for all conditions. Table 32 indicates that implementation of the proposed project alternatives would result in minor and inconsequential increases in Formaldehyde, Acetalydehyde, DPM, Butadiene, Benzene, and Acrolein emissions under 2020, 2030, and 2040 conditions, which is considered a less than significant impact under CEQA.

Table 32 MSAT Emissions for I-5 south of Garden Highway (grams per day)

	DPM	Δ	Formaldehyde	Δ	Butadiene	Δ
Existing (2006)	466,724.88		228,859.08		41,951.34	
2020 No Project	198,960.84	17.82	97,726.36	8.75	13,049.70	1.17
2020 With Project	198,978.66		97,735.11		13,050.87	

2030 No Project	149,098.99	19.75	79,297.05	10.50	11,159.51	1.47
2030 With Project	149,118.74		79,307.55		11,160.98	
2040 No Project	139,584.64	23.27	75,986.57	12.66	10,944.93	1.73
2040 With Project	139,607.91		75,999.23		10,946.76	
	Benzene	**Δ**	**Acrolein**	**Δ**	**Acetalydehyde**	**Δ**
Existing (2006)	226,976.53		9,412.75		82,020.14	
2020 No Project	85,366.56	7.46	2,870.28	0.26	38,680.50	3.46
2020 With Project	85,374.20		2,870.54		38,683.96	
2030 No Project	70,909.09	9.39	2,412.27	0.32	31,205.57	4.13
2030 With Project	70,918.48		2,412.59		31,209.70	
2040 No Project	67,659.61	11.27	2,397.77	0.40	29,743.80	4.96
2040 With Project	67,670.88		2,398.17		29,748.76	

Generation of Operation-Related Emissions of Ozone Precursors, Carbon Monoxide, and Particulate Matter in Excess of Sacramento Metropolitan Air Quality District Standards (CEQA)

Long-term air quality impacts are those associated with motor vehicles operating on the roadway network, predominantly those operating in the project vicinity. Emission of ROG, NO_x, CO, PM_{10}, $PM_{2.5}$ and CO_2 for existing year (2006), construction year (2020) with and without project, interim year (2030) with and without project and design-year (2040) with and without project conditions were evaluated through modeling conducted using the ARB's CT-EMFAC model and vehicle activity data provided by the project traffic engineer, Fehr & Peers (Fehr & Peers 2008b).

Table 33 summarizes the modeled yearly emissions. The differences in emissions between with- and without-project conditions represent emissions generated directly as a result of implementation of the proposed project. Vehicular emission rates are anticipated to lessen in future years due to continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

Table 33 Summary of Project-Related Emissions (tons per year)

	Yearly VMT	Δ	ROG	Δ	NO_X	Δ	CO	Δ
Existing (2006)	36,912,756		21,650.50		70,991.57		310,813.23	
2020 No Project	45,560,075	4,079 (0.01%)	10,047.24	0.90	24,740.49	2.22	130,670.60	11.70
2020 With Project	45,564,154		10,048.14		24,742.70		130,682.30	
2030 No Project	51,324,955	6,798 (0.01%)	8,055.97		15,130.45		97,714.87	
2030 With Project	51,331,753		8,057.03		15,132.45		97,727.81	
2040 No Project	57,089,835	9,518 (0.02%)	7,389.22	1.07	12,257.34	2.00	90,098.58	12.94
2040 With Project	57,099,352		7,390.45		12,259.39		90,113.60	
SMAQMD Thresholds		*NA*		*65*		*65*		*None*
	PM10	**Δ**	**PM2.5**	**Δ**	**CO_2[1]**	**Δ**		
Existing (2006)	1,804.18		1,688.13		13,899.83			
2020 No Project	1,700.10	0.15	1,512.58	0.14	18,036.80	1.61		
2020 With Project	1,700.26		1,512.71		18,038.41			
2030 No Project	1,770.27		1,673.76		20,243.94			
2030 With Project	1,770.51		1,673.98		20,246.62			
2040 No Project	1,860.24	0.23	1,749.61	0.22	22,430.86	2.68		
2040 With Project	1,860.55		1,749.90		22,434.60			
SMAQMD Thresholds		*CAAQS*		*CAAQS*		*None*		

Note: CO^2 presented in metric tons per year.

Project-level emissions were obtained by comparing future with-project emissions to future without-project emissions. Table 33 presents project-level emissions and indicates that project-related emissions are not anticipated to exceed SMAQMD thresholds (See Table 34).

Table 34 SMAQMD Thresholds of Significance

	Ozone Precursor Emissions			
	ROG (pounds per day)	**NO_x (pounds per day)**	**CO**	**PM_{10}**
Construction (short-term)	None	85	CAAQS[a]	CAAQS[a]
Operational (long-term)	65	65	CAAQS[a]	CAAQS[a]

[a] California Ambient Air Quality Standards (CAAQS)

A project that may cause an exceedance of a state air quality standard, or may make a substantial contribution to an existing exceedance of an air quality standard will have a significant adverse air quality impact. "Substantial" is defined as making measurably worse, which is 5% or more of an existing exceedance of a state ambient air quality standard.

Source: Sacramento Metropolitan Air Quality Management District 2004

Temporary Increase in Ozone Precursor (ROG and NOx), CO and PM10 Emissions during Grading and Construction Activities

Implementation of the proposed project would result in the construction of widened roads, overcrossings, and embankments, as well as intersection improvements. Temporary construction emissions would result from grubbing/land clearing, grading/excavation, drainage/utilities/subgrade construction, and paving activities and construction worker commuting patterns. Pollutant emissions would vary daily, depending on the level of activity, specific operations, and prevailing weather.

The SMAQMD Road Construction Emissions Model (Version 6.3) was used to estimate construction-related ozone precursors (ROG and NO_x), CO, PM_{10}, $PM_{2.5}$, and CO_2 emissions from construction activities. It was assumed that construction activities would occur for 8 hours per day over a 24-month period commencing in 2011. The total project length was assumed to be 5 miles, with a total acreage of 15 acres and a maximum of 3.75 acres disturbed per day. It was also assumed that no soil would be imported or exported. Construction activities were divided into separate phases and analyzed separately. The results of modeling for construction activities are summarized in Table 35.

Table 35 Construction Emission Estimates for (pounds per day)

Construction Phase	ROG	NOX	CO	PM10	PM2.5	CO2
Grubbing/land clearing	8.7	46.1	29.8	40.1	10.2	4,311.8
Grading/excavation	10.1	56.3	34.7	40.8	10.9	5,567.7
Drainage/utilities/sub-grade	7.7	39.3	26.2	40.0	10.1	4,083.1
Paving	6.9	27.5	21.7	2.5	2.3	2,697.0
Total	33.4	169.1	112.4	123.4	33.4	16,659.6
SMAQMD Threshold	None	85	None	CAAQS	CAAQS	None

Note: Emissions calculations based on Road Construction Emissions Model (Version 6.3)

Table 35 indicates that construction activities would not exceed SMAQMD threshold levels (Table 29). As previously indicated, the SMAQMD has established screening-level criteria for the assessment of significant impacts from construction-related emissions of fugitive dust. These screening criteria are based on a project's maximum actively disturbed area.

3.5 Climate Change under 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 (GHG) emissions reduction and climate change research and policy have increased dramatically in recent years. These efforts are primarily concerned with the emissions of GHG related to human activity that include carbon dioxide (CO_2), methane, nitrous oxide, tetrafluoromethane, hexafluoroethane, sulfur hexafluoride, HFC-23 (fluoroform), HFC-134a (s, s, s, 2 –tetrafluoroethane), and HFC-152a (difluoroethane).

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

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

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

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

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

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

> **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs),

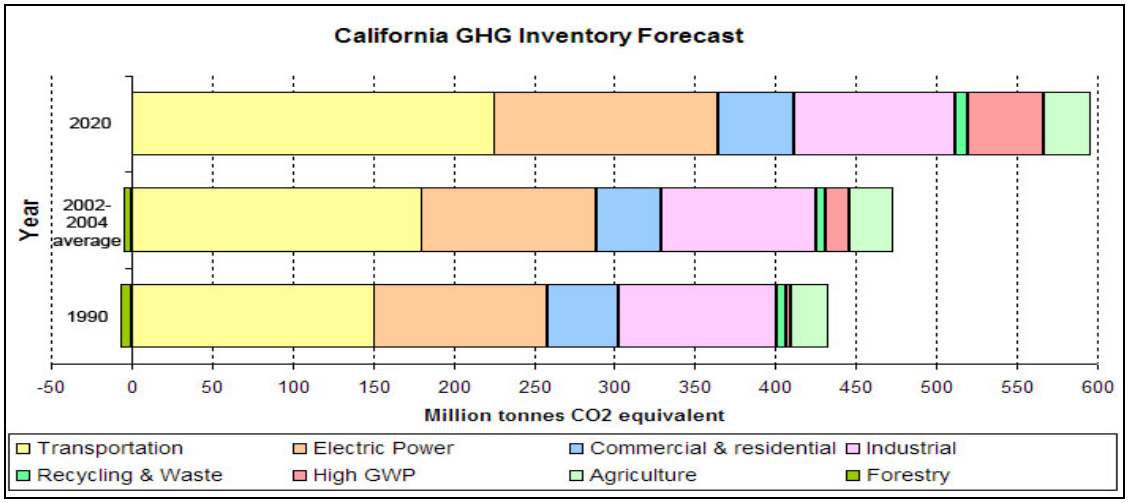
> perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)--in the atmosphere threaten the public health and welfare of current and future generations.
>
> **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action is a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles, which were jointly proposed by EPA and the Department of Transportation's National Highway Safety Administration on September 15, 2009.

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

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

Figure 16 California Greenhouse Gas Inventory



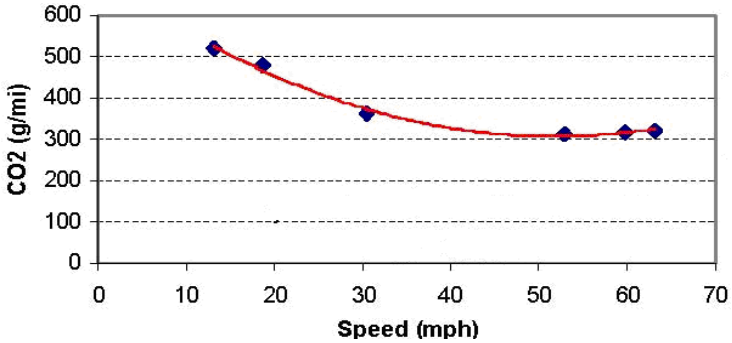
Taken from : http://www.arb.ca.gov/cc/inventory/data/forecast.htm

Caltrans and its parent agency, the Business, Transportation, and Housing Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 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 (see Climate Action Program at Caltrans (December 2006), Caltrans has created and is implementing the Climate Action Program at Caltrans that was published in December 2006. This document can be found at: http://www.dot.ca.gov/docs/ClimateReport.pdf

3.5.1 Project Analysis

One of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. The highest levels of carbon dioxide from mobile sources, such as automobiles, occur at stop-and-go speeds (0-25 miles per hour) and speeds over 55 mph; the most severe emissions occur from 0-25 miles per hour (See Figure 17). To the extent that a project relieves congestion by enhancing operations and improving travel times in high congestion travel corridors GHG emissions, particularly CO_2, may be reduced.

Figure 17 Fleet CO_2 Emissions vs. Speed (Highway)



Source: Center for Clean Air Policy— http://www.ccap.org/Presentations/Winkelman%20TRB%202004%20(1-13-04).pdf

Increase in Greenhouse Gas (GHG) Contaminant Emissions

Impacts associated with GHGs are long-term climatic changes. As previously noted, GHG contaminant emissions tend to accumulate in the atmosphere because of their relatively long lifespan. As a result, their impact on the atmosphere is mostly independent of the point of emission; GHG contaminant emissions are more appropriately evaluated on a regional, state, or even national scale than on an individual project level. It is anticipated that GHG emissions would increase with implementation of the proposed project alternatives.

The purpose of this project is to reduce traffic delays by improving the interchange operation and safety, improve air-quality, increase capacity and promote ride-sharing. Traffic on both I-5 and I-80 has steadily increased over the last few decades with commercial and residential development along the I-5 and I-80 corridors reducing operating efficiency of the existing interchange. The project area has been incorporated for larger studies in the Sacramento Transportation Authority (STA) Freeway Safety and Congestion Relief Program as well as part of the larger existing and planned HOV network in the Sacramento region supporting van pools, carpools, and transit. As part of the regional transportation plans, including the 2009/2012 Metropolitan Transportation Implementation Plan (MTIP), the Metropolitan Transportation Plan (MTP) 2035, Measure A funding, and the Sacramento Regional Blueprint, this project is also identified in the current SACOG MTIP as a part of the area's overall strategy for providing mobility, congestion relief, and reduction of transportation-related air pollution in support of efforts to attain federal air quality standards for the region.

This project supports the goals of the SACOG 2035 Metropolitan Transportation Plan by providing greater connectivity with the existing and proposed HOV network in the Sacramento region. Additionally, the vision is to provide congestion relief by carrying more people in fewer vehicles during peak periods and promote ride sharing and the use of high occupancy vehicles, such as carpools, vanpools, and express bus services. The proposed project will construct an HOV flyover and connect future HOV lanes to provide continuity of HOV lanes in the vicinity of the project. As such, this project is a transportation demand project by definition.

The existing I-5/I-80 interchange is a freeway-to freeway interchange constructed in 1968. Within the project limits, I-5 is an eight-lane divided freeway with auxiliary lanes to and from the adjacent interchanges. I-80 is a six-lane divided freeway within the project limits. A portion of the eastbound I-80 mainline between I-5 and the San Juan Road Overcrossing is reduced to two lanes. The portion of I-80 east of the interchange has auxiliary lanes to and from the Truxel Road interchange. Under existing conditions , recurrent congestion is experienced during morning and evening peak periods on I-5 (in both directions), as well as eastbound I-80, near the interchange from lack of capacity and short weaving distances between the on and off-ramps and the connector ramps. The bike path on San Juan Road, beginning at Azevedo Road

and ending at Airport Boulevard will be perpetuated. The city of Sacramento is proposing to extend the bicycle lane to West El Camino Avenue.

Section 1.3.2, Operational Deficiencies, details the operational and accessibility constraints and Section 2.10, Traffic Capacity and Congestion, describes the worsening weaving, delays and interruptions in traffic flow to which commuters would be subject in 2040 without the proposed operational improvements. Continued development along the I-5 and I-80 corridors and increasing traffic volumes will further exacerbate the eroding operating conditions which commuters would be subject to without this project in 2040. The American River Bridge bottleneck generates congestion that extends to SR 99 on southbound I-5 under all alternatives. There is a proposal included in the MTP to provide an all modal river crossing near Truxel, which could relieve some of the congestion on I-5 at the American River Bridge.

For 2040 conditions, congestion would be relieved with improved traffic flows, greater speeds, improved travel times reductions, and less congestion delay (See Table 36). The improved performance was a result of adding HOV direct connectors and replacing the existing loop connector in the southeast quadrant with a multilane flyover connector. Elimination of the existing connector would permit more efficient weave/merge movements and improve safety onto eastbound I-80 under the I-5 OC. The build alternative improvements are expected to reduce sideswipe, hit object, and overturn accidents for interchange loop ramps.

Table 36 Vehicle miles/hours travelled

Scenario	Daily Vehicle Miles Traveled	Daily Vehicle Hours Traveled	Daily Average Speed (miles per hour)
Existing conditions	36,912,756	1,013,096	41.74
2020 no project	45,560,075	1,355,023	39.9
2020 with project	45,564,154	1,355,836	39.9
2020 with project – 2020 no project	4,079 (0.01%)	813 (0.06%)	0.0 (0%)
2030 no project	51,324,955	1,582,974	38.7
2030 with project	51,331,753	1,584,329	38.7
2030 with project – 2030 no project	6,798 (0.01%)	1,355 (0.09%)	0.0 (0%)
2040 no project	57,089,835	1,810,925	37.4
2040 with project	57,099,352	1,812,822	37.5
2040 with project – 2040 no project	9,518 (0.02%)	1,897 (0.10%)	0.1 (0.3%)

Source: Fehr & Peers 2008b

Quantitative Analysis

The quantification of CO_2 emissions was conducted using the Air Resources Boards' CT-EMFAC model and vehicle activity data provided by the project traffic engineer, Fehr & Peers

(Fehr & Peers 2008b). Yearly emissions of CO_2 associated with and without implementation of the proposed project alternatives are presented in Table 37.

Increases of CO_2 emissions over existing conditions are predicted by the modeling. Table 37 indicates that implementation of the proposed project when compared to the no project condition would result in increased CO_2 emissions of 1.61 metric tons per year 2020 conditions, 2.68 metric tons per year for 2030 conditions, and 3.74 metric tons per year for 2040 conditions. This is equivalent to an increase of less than 1 passenger cars/day, assuming the average U.S. passenger vehicle emits approximately 5.20 metric tons CO^2e (U.S. Environmental Protection Agency 2005, http://www.epa.gov/otaq/climate/420f05004.htm).

The 2006 existing condition CO_2 emissions were about 13,900 metric tons per year. In 2020, the CO_2 emissions are anticipated to be approximately 18,037 metric tons per year without the project and 18,038 metric tons per year with the project. While the modeling does show an increase in CO_2 emissions over existing conditions, it is important to note that even in the "no build" condition, CO_2 emission increases are anticipated. In fact, as the modeling results show, the majority of the CO_2 emission increases are not caused by the project since the difference between the "with project" and "without project" CO_2 emissions ranges from only about 1.6 metric tons per year to 3.74 metric tons per year. Even without the project, the 2040 "no build" condition has a modeled increase of 8.5 metric tons per year, which is a 61.3% increase over the existing conditions. This indicates that a substantial portion of the CO_2 emission increase stems from factors outside of the project, such as constrained traffic movements outside the project area, land use changes, and population growth.

Table 37 Summary of Project-Related Emissions (pounds per day)

	Yearly VMT	Δ		CO2[1]	Δ
Existing (2006)	36,912,756	-		13,899.83	-
2020 No Project	45,560,075	4,079 (0.01%)		18,036.80	1.61
2020 With Project	45,564,154			18,038.41	
2030 No Project	51,324,955	6,798 (0.01%)		20,243.94	2.68
2030 With Project	51,331,753			20,246.62	
2040 No Project	57,089,835	9,518 (0.02%)		22,430.86	3.74
2040 With Project	57,099,352			22,434.60	
SMAQMD Thresholds	-	*NA*		-	*None*

[1] CO_2 presented in metric tons per year.

Limitations and Uncertainties with Modeling

EMFAC

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting CO_2 emissions. According to the *National Cooperative Highway Research Program* report, Development of a Comprehensive Modal

Emission Model (April 2008), studies have revealed that brief but rapid accelerations can contribute significantly to a vehicle's carbon monoxide and hydrocarbon emissions during a typical urban trip. Current emission-factor models are insensitive to the distribution of such modal events (i.e., cruise, acceleration, deceleration, and idle) in the operation of a vehicle and instead estimate emissions by average trip speed. This limitation creates an uncertainty in the model's results when compared to the estimated emissions of the various alternatives with baseline in an attempt to determine impacts. Although work by EPA and the CARB is underway on modal-emission models, neither agency has yet approved a modal emissions model that can be used to conduct this more accurate modeling. In addition, EMFAC does not include speed corrections for most vehicle classes for CO_2 – for most vehicle classes emission factors are held constant which means that EMFAC is not sensitive to the decreased emissions associated with improved traffic flows for most vehicle classes. Therefore, unless a project involves a large number of heavy-duty vehicles, the difference in modeled CO_2 emissions due to speed change will be slight.

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

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

Other Variables

With the current science, project-level analysis of greenhouse gas emissions is limited. Although a greenhouse gas analysis is included for this project, there are numerous key greenhouse gas variables that are likely to change dramatically during the design life of the proposed project and would thus dramatically change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2008 (http://www.epa.gov/oms/fetrends.htm)," which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy has improved each year beginning in 2005, and is now the highest since 1993. Most of the increase since 2004 is due to higher fuel economy for light trucks, following a long-term trend of slightly declining overall fuel economy that peaked in 1987. These vehicles also have a slightly lower market share, peaking at 52 percent in 2004 with projections at 48 percent in 2008. Table 38 shows the alternatives for vehicle fuel economy increases currently being studied by the National Highway

Traffic Safety Administration in its Draft EIS for New Corporate Average Fuel Economy (CAFE) Standards (June 2008).

Table 38 Vehicle Fuel Economy

Model Year 2015 Required Miles Per Gallon (mpg) by Alternative							
No Action		25% Below Optimized	Optimized (Preferred)	25% Above Optimized	50% Above Optimized	Total Costs Equal Total Benefits	Technology Exhaustion
Cars	27.5	33.9	35.7	37.5	39.5	43.3	52.6
Trucks	23.5	27.5	28.6	29.8	30.9	33.1	34.7

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

> Large advancements have occurred in fuel cell vehicle and hydrogen infrastructure technology over the past 15 years. Fuel cell technology has progressed substantially resulting in power density, efficiency, range, cost, and durability all improving each year. In another sign of progress, automotive developers are now demonstrating over 100 fuel cell vehicles (FCVs) in California – several in the hands of the general public – with configurations designed to be attractive to buyers. Cold-weather operation and vehicle range challenges are close to being solved, although vehicle cost and durability improvements are required before a commercial vehicle can be successful without incentives. The pace of development is on track to approach pre-commercialization within the next decade.
>
> A number of the U.S. DOE 2010 milestones for FCV development and commercialization are expected to be met by 2010. Accounting for a five to six year production development cycle, the scenarios developed by the U.S. DOE suggest that 10,000s of vehicles per year from 2015 to 2017 would be possible in a federal demonstration program, assuming large cost share grants by the government and industry are available to reduce the cost of production vehicles.[3]

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

Fourth, driver behavior has been changing as the U.S. economy and oil prices have changed. In its January 2008 report, "Effects of Gasoline Prices on Driving Behavior and Vehicle Market,"

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

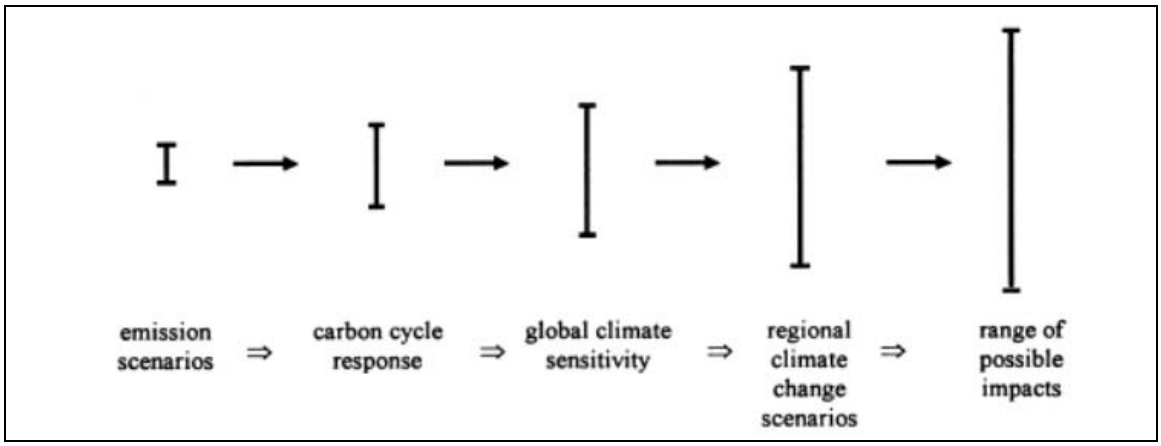
(http://www.cbo.gov/ftpdocs/88xx/doc8893/01-14-GasolinePrices.pdf) the Congressional Budget Office found the following results based on data collected from California: 1) freeway motorists have adjusted to higher gas prices by making fewer trips and driving more slowly; 2) the market share of sports utility vehicles is declining; and 3) the average prices for larger, less-fuel-efficient models have declined over the past five years as average prices for the most-fuel-efficient automobiles have risen, showing an increase in demand for the more fuel efficient vehicles.

Limitations and Uncertainties with Impact Assessment

Taken from pp. 3-48 and 3-49 of the National Highway Traffic Safety Administration Draft EIS for New CAFE Standards (June 2008), Figure 18 illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis:

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

Figure 18 Cascade of Uncertainties



Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment for this project of what the modeled 2020 Build scenario of 1.61 to the 2040 Build scenario of 3.64 ton increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of $C0_2$ equivalent. This uncertainty only increases when viewed globally. The IPCC has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce greenhouse gas

emissions. Non-mitigation IPCC scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO_2 from 2000 to 2030, which represents an increase of between 25 and 90%.[4]

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing "new" greenhouse gas emissions.

Although some of the emission increases might be new, the extent to which the modeled 1.64 to 3.64 ton increase in CO_2 emissions represents a net global increase, reduction, or no change, is uncertain and there are no models approved by regulatory agencies that operate at the global or even statewide scale.

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

> In analyzing across the CAFE 30 alternatives, the mean change in the global mean surface temperature, as a ratio of the increase in warming between the B1 (low) to A1B (medium) scenarios, ranges from 0.5 percent to 1.1 percent. The resulting change in sea level rise (compared to the No Action Alternative) ranges, across the alternatives, from 0.04 centimeter to 0.07 centimeter. In summary, the impacts of the model year 2011-2015 CAFE alternatives on global mean surface temperature, sea level rise, and precipitation are relatively small in the context of the expected changes associated with the emission trajectories. This is due primarily to the global and multi-sectoral nature of the climate problem. Emissions of CO_2, the primary gas driving the climate effects, from the United States automobile and light truck fleet represented about 2.5 percent of total global emissions of all greenhouse gases in the year 2000 (EPA, 2008; CAIT, 2008). While a significant source, this is a still small percentage of global emissions, and the relative contribution of CO_2 emissions from the United States light vehicle fleet is expected to decline in the future, due primarily to rapid growth of emissions from developing economies (which are due in part to growth in global transportation sector emissions). [NHTSA Draft EIS for New CAFE Standards, June 2008, pp.3-77 to 3-78].

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

3.5.2 CEQA Conclusion

While the project is anticipated to result in a slight increase in CO_2 emissions, the increase is very small. In addition, the majority of the CO_2 emissions increases are caused not by the project itself but by other factors such as population growth and land use. This project is also an integral part of an overall transportation strategy to support transit and reduce congestion. Based on the limitations outlined above, it is Caltrans determination that in the absence of further regulatory or scientific information related to greenhouse gas emissions and CEQA significance, it is too speculative to make a determination regarding the project's direct impact and its contribution on the cumulative scale to climate change. However, Caltrans is firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the following section.

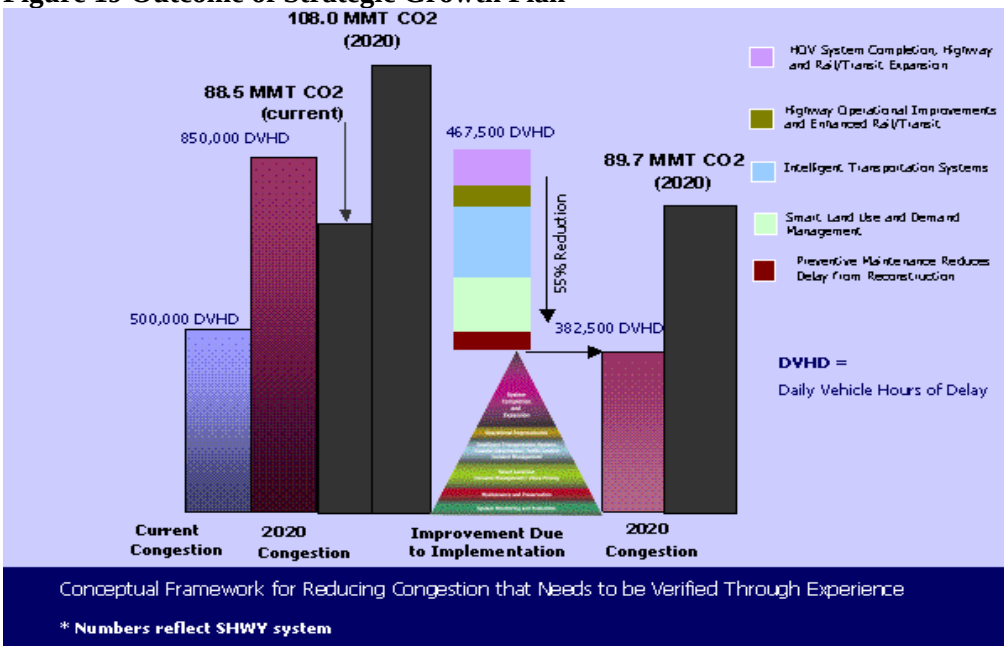
3.5.3 Construction GHG Emissions

GHG emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the GHG emissions produced during construction can be mitigated to some degree by longer intervals between maintenance and rehabilitation events. Measures to reduce construction related emissions from this project are discussed in Section 2.19.4

3.5.4 Assembly Bill 32 Compliance (AB 32)

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

Figure 19 Outcome of Strategic Growth Plan



As part of the 2006Climate Action Program at Caltrans, http://www.dot.ca.gov/docs/ClimateReport.pdf), Caltrans 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. Caltrans is working closely with local jurisdictions on planning activities; however, Caltrans does not have local land use planning authority. Caltrans is also supporting efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; Caltrans is doing this by supporting on-going research efforts at universities, by supporting legislative efforts to increase fuel economy, and by its participation on the Climate Action Team. It is important to note, however, that the control of the fuel economy standards is held by EPA and CARB. Lastly, the use of alternative fuels is also being considered; Caltrans is participating in funding for alternative fuel research at the UC Davis.

Table 39 summarizes Caltrans' and statewide efforts that Caltrans is implementing in order to reduce GHG emissions. For more detailed information about each strategy, please see Climate Action Program at Caltrans (December 2006); it is available at http://www.dot.ca.gov/docs/ClimateReport.pdf.

Table 39 Climate Change Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO_2 Savings (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local Governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Trans. System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	.007	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, CARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.45 .0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 .36	3.6
Goods Movement	Office of Goods Movement	Cal EPA, CARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.67

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

Caltrans and the California Highway Patrol are working with regional agencies to implement intelligent transportation systems (ITS) to help manage the efficiency of the existing highway system. ITS is commonly referred to as electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.

In addition, Caltrans provides ridesharing services and park-and-ride facilities to help manage the growth in demand for highway capacity.

According to Caltrans Standard Specification Provisions, idling time for lane closure during construction is restricted to ten minutes in each direction; in addition, the contractor must comply with Sacramento Metropolitan Air Quality Control District's rules, ordinances, and regulations in regards to air quality restrictions.

3.5.5 Adaptation Strategies

Addressing climate change requires a two-pronged approach: mitigation and adaptation. The previous discussion addressed the primary cause of climate change, greenhouse gas (GHG), and the state's efforts to reduce these emissions. It covered the executive orders and legislation, strategies to reduce and mitigate the effects of these emissions, and analytical methods to analyze GHG for environmental documents.

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

Climate change adaption must also involve the natural environment as well. Efforts are underway to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation.

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

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

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

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

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

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

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

Prior to the release of the final Sea Level Rise Assessment Report, all state agencies that are planning to construct projects in areas vulnerable to future sea level rise were directed to consider a range of sea level rise scenarios for the years 2050 and 2100 in order to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. However, all projects that have filed a Notice of Preparation, and/or are programmed for construction funding the next five years (through 2013), or are routine maintenance projects as of the date of Executive Order S-13-08 may, but are not required to, consider these planning guidelines. The Notice of Preparation for this project was issued on February 20, 2008 and filed with the Governor's Office of Planning and Research. Sea level rise estimates should also be used in conjunction with information regarding local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data. (Executive Order S-13-08 allows some exceptions to this planning requirement.)

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is an active participant in the efforts being conducted as part of Governor's Schwarzenegger's Executive Order on Sea Level Rise and is mobilizing to be able to respond to the National Academy of Science report on Sea Level Rise Assessment which is due to be released by December 2010. Currently, Caltrans is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change impacts, Caltrans has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, Caltrans will be able review its current design standards to determine what changes, if any, may be warranted in order to protect the transportation system from sea level rise. For additional information regarding the potential impacts of climate change in California, see Our Changing Climate: Assessing the Risks to California, A Summary Report from the California Climate Change Center at http://www.energy.ca.gov/2006publications/CEC-500-2006-077/CEC-500-2006-077.PDF.

3.6 Mitigation Measures for Significant Impacts under CEQA

All impacts stemming from the proposed project will be mitigated to less than significant. Below is a summary of mitigation proposed under CEQA.

3.6.1 Giant Garter Snake

The proposed project will temporarily impact 3.83 acres and permanently impact 1.76 acres of giant garter snake upland habitat. The project will not impact any giant garter snake aquatic habitat. The areas of upland habitat that the proposed project will impact are ruderal grasslands between the Natomas drainage canals and I-5 and I-80. More details of avoidance, minimization, and mitigation measures can be found in Section 2.26.9. GGS habitat will be avoided by establishing ESA fencing to prevent disturbance beyond what's necessary for construction.

Other avoidance measures include construction windows, minimizing disturbed areas, and pre-construction surveys.

After construction is completed temporary fill and construction debris will be removed and, wherever feasible, disturbed areas will be restored to pre-project conditions. Table 40 summarizes the conservation measures that will be taken.

Table 40 Summary of Giant Garter Snake Conservation Measures

EFFECTS:	EFFECTS:	CONSERVATION MEASURE:
Temporary (1 season)	Temporary impacts will not exceed 20 acres and no permanent impacts.	Habitat Restoration
Temporary (2 seasons)	Temporary impacts will not exceed 20 acres and no permanent impacts.	Habitat Restoration plus 1:1 replacement
Temporary (More than 2 seasons)	Temporary impacts will not exceed 20 acres and no permanent impacts.	3:1 Replacement (or restoration plus 2:1 replacement)
Permanent loss	The project will not exceed three acres of giant garter snake habitat and will impact less than one acre of aquatic habitat.	3:1 Replacement

Compensatory mitigation shall be determined according to the "Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake *(Thamnophis gigas)* Habitat" (USFWS 2005a) as outlined in Table 27.

Temporary impacts are expected to last for one season and the disturbed area will be revegetated following the measures outlined above.

Permanent impacts will be compensated for at a 3:1 ratio. A total of 5.28 acres of giant garter snake upland habitat mitigation will be required to fully compensate for project impacts. All mitigation will be completed within the Sacramento River watershed and will be approved by USFWS.

Cumulative impacts for the GGS are not considered significant because the proposed mitigation already renders the impacts "less than cumulative considerable."

3.6.2 Swainson's Hawk

More details of Swainson's hawk avoidance, minimization, and mitigation measures are provided in Section 2.26.5. No Swainson's hawk's nests were observed within the ESL though there are two known nest trees within a quarter mile of the ESL. 9.85 acres of foraging habitat is will be permanently impacted by the project.

Avoidance measures include designing the project for the minimum footprint necessary.

Compensatory mitigation for impacts to Swainson's hawk foraging habitat will follow the *Staff Report Regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (DFG, 1994). As outlined in this document, impacts to foraging habitat shall be mitigated for at a 1:1 ratio for impacts within one mile of an active nest. Impacts are currently estimated at 9.85 acres within one mile of an active nest. Based on these amounts, 9.85 acres of Swainson's hawk foraging habitat mitigation will be needed.

Cumulative impacts for the Swainson's hawk are not considered significant because the proposed mitigation already renders the impacts "less than cumulative considerable."

3.6.3 Visual Impacts

Nineteen acres of new trees, shrubs and irrigation systems will be installed between the property line and the new auxiliary lanes as compensation for the loss of vegetation and highway planting.