Chapter 4
Air Quality and Climate Change

4.1 Introduction

This chapter provides an analysis of air quality and climate change impacts resulting from the proposed project. It describes existing air quality conditions in the project area, identifies sensitive land uses, and summarizes the overall regulatory framework for air quality management in California and the region, as well as regulations pertaining to climate change and greenhouse gas (GHG) emissions. Environmental impacts related to air quality and climate change, as well as mitigation measures to reduce or eliminate potential impacts, are also discussed.

The following sources were used to prepare this chapter:

- Aerometric Data Analysis and Management System's Air Quality Data Regulatory Setting (California Air Resources Board 2010a)
- Air Designation Maps/State and National (California Air Resources Board 2010b)
- *The Green Book of Nonattainment Areas for Criteria Pollutants* (U.S. Environmental Protection Agency 2010a)
- *Guide to Air Quality Assessment in Sacramento County* (Sacramento Metropolitan Air Quality Management District 2009a)
- *Guide to Air Quality Assessment: Determining Significance of Air Quality Impacts under the California Environmental Quality Act* (El Dorado County Air Pollution Control District 2002)
- Intergovernmental Panel on Climate Change. 1996. 1995: Science of Climate Chang. (Second Assessment Report). Cambridge University Press. Cambridge, U.K
- Intergovernmental Panel on Climate Change. 2001. Atmospheric Chemistry and Greenhouse Gases. In: Climate Change 2001: Working Group I: The Scientific Basis. Available: http://www.ipcc.ch/ipccreports/tar/wg1/pdf/TAR-04.PDF. Accessed: September 22, 2009.
- Intergovernmental Panel on Climate Change. 2007. Introduction. In: Climate Change 2007: Mitigation (Working Group III Fourth Assessment Report.) Available: <://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-spm.pdf >. Accessed: August 11, 2009.

4.2 Environmental Setting

4.2.1 Existing Conditions

This section discusses existing air quality conditions in the study area, which is bounded by I-5 and Bradshaw Road on the west, the Cosumnes River on the south, Grant Line and White Rock Roads on the east, and US 50 on the north.

4.2.1.1 Climate and Meteorology

California is divided into 15 air basins based on geographic features that create unique regional climates. Sacramento County is located within the southern region of the Sacramento Valley Air Basin (SVAB), and El Dorado County is located within the westernmost area of the Mountain Counties Air Basin (MCAB). Because the project alignment only stretches 3 miles into the MCAB, and the climate does not change dramatically at this border between the SVAB and MCAB, the climate within the air quality study area is most accurately characterized by that of the SVAB.

Hot, dry summers and mild, rainy winters characterize the Mediterranean climate of the SVAB. During the year, the temperature may range from 20–115°F, with summer highs usually in the 90s and winter lows occasionally below freezing. Average annual rainfall is about 20 inches, with about 75% of the total falling during the rainy season (generally from November through March). The prevailing winds are moderate in strength and vary from moist, clean breezes from the south to dry land flows from the north.

The mountains surrounding the SVAB create a barrier to airflow, which can trap air pollutants under certain meteorological conditions. The highest frequency of air stagnation occurs in autumn and early winter when large high-pressure cells lie over the Sacramento Valley. The lack of surface wind during these periods and the reduced vertical flow caused by less surface heating reduces the influx of outside air and allows air pollutants to become concentrated in a stable volume of air. The surface concentrations of pollutants are highest when these conditions are combined with smoke or when temperature inversions trap cool air, fog, and pollutants near the ground.

The ozone season (May through October) in the Sacramento Valley is characterized by stagnant morning air or light winds with the Delta sea breeze arriving in the afternoon out of the southwest. Usually, the evening breeze transports the airborne pollutants to the north out of the Sacramento Valley. During about half of the days from July to September, however, a phenomenon called the Schultz Eddy prevents this from occurring. Instead of allowing the prevailing wind patterns to move north carrying the pollutants out, the Schultz Eddy causes the wind pattern to circle back south. Essentially, this phenomenon causes the air pollutants to be blown south toward the Sacramento area. This phenomenon exacerbates the pollution levels in the area and increases the likelihood of violating federal or state standards. The eddy normally dissipates around noon, when the Delta sea breeze arrives. (Sacramento Metropolitan Air Quality Management District 2009a.)

4.2.1.2 Criteria Pollutants

The U.S. Environmental Protection Agency (EPA) and California Air Resources Board (ARB) have established ambient air quality standards for six criteria pollutants: ozone, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, lead, and particulate matter (PM), which consists of PM less than 10 microns (PM10) and PM less than 2.5 microns (PM2.5). Primary air pollutants generated by vehicle exhaust and combustion of fossil fuel include ozone precursors—nitrogen oxides (NO_x) and reactive organic gases (ROGs)—CO, and PM. Although not yet regulated by federal air standards, toxic air containments (TACs) and GHGs are also generated by vehicle exhaust and fossil fuel combustion.

Based on local monitoring data, the major pollutants of concern in the air quality study area are ozone, CO, and PM. These criteria pollutants, as well as TACs, mobile source air toxics (MSATs), naturally occurring asbestos (NOA), and GHGs, are described below.

Ozone

Ozone is a nearly colorless, odorless gas that irritates the lungs and damages materials and vegetation. It is created by chemicals that come from many sources, including mobile sources such as automobiles, buses, trucks, trains, construction vehicles, and airplanes. Ozone is a major component of smog in the Sacramento region (approximately 40%), and results from the photochemical reaction of ROGs and NO_x in the presence of sunlight and heat. Although ozone is the air contaminant for which standards are set, ozone precursors (ROGs and NO_x) are the pollutants that must be controlled. Health researchers have found that exposure to ozone can decrease lung function, reduce disease resistance, and aggravate heart disease, asthma, bronchitis, and emphysema.

Carbon Monoxide

CO is a highly toxic, odorless, colorless gas that binds to hemoglobin in the bloodstream in place of oxygen molecules. By reducing the oxygen-carrying potential of blood, CO causes heart difficulties in people with chronic diseases, reduces lung capacity, impairs mental functioning by interfering with the transfer of oxygen to the brain, and may aggravate arteriosclerosis. CO is primarily produced by the incomplete combustion of carbon-containing fuels (vehicular exhaust from tailpipes). CO is primarily a local pollutant that creates individual hot spots, or small areas where CO concentrations are high. CO is mostly a winter problem in the Sacramento urbanized area.

Particulate Matter

PM refers to finely divided solids or liquids, such as soot, dust, aerosols, and mists. Suspended particulates aggravate chronic heart and lung disease problems, produce respiratory problems, and often transport toxic elements. Suspended particulates also absorb sunlight, producing haze and reducing visibility. PM in Sacramento County is caused primarily by dust from grading and excavation activities, agricultural uses, and motor vehicles, particularly diesel-powered vehicles. PM10 causes a greater health risk than larger particles because these fine particles can more easily penetrate the defenses of the human respiratory system.

Similar to PM10, PM2.5 is primarily the result of combustion in motor vehicles, particularly diesel engines, as well as industrial sources and residential/agricultural activities such as burning. It is also formed through the reaction of other pollutants. As with PM10, these particulates can increase the chance of respiratory disease, and cause lung damage and cancer.

Toxic Air Contaminants

TACs are pollutants that may result in an increase in mortality or serious illness, or that may pose a present or potential hazard to human health. Health effects of TACs include cancer, birth defects, neurological damage, damage to the body's natural defense system, and diseases that lead to death. In 1998, following a 10-year scientific assessment process, the ARB identified PM from diesel-fueled engines—commonly called diesel particulate matter (DPM)— as a TAC. Compared to other air toxics the ARB has identified, DPM emissions are estimated to be responsible for about 70% of the total ambient air toxics risk (California Air Resources Board 2000).

Mobile Source Air Toxics

By including air toxics regulations in the California Clean Air Act (California CAA), the State of California made controlling air toxic emissions a national priority. Congress followed this lead and mandated that the EPA regulate 188 air toxics. These substances are also known as hazardous air pollutants (HAPs). The EPA's latest rule on the control of HAPs from mobile sources (72 Federal Register [FR] 8430) identified a group of 93 compounds emitted from mobile sources that are listed in its Integrated Risk Information System. From this list, the EPA has identified seven as priority MSATs:

- Acrolein
- Benzene
- 1,3-Butadiene
- DPM/diesel exhaust organic gases
- Formaldehyde
- Naphthalene
- Polycyclic organic matter

The EPA's rule requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using the EPA's MOBILE6.2 model, even if VMT increases by 145% (as assumed by 2050), a combined reduction of 72% in the total annual emission rate for the priority MSATs is projected from 1999 to 2050 (Federal Highway Administration 2009).

Naturally Occurring Asbestos

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals. It has been mined for applications requiring thermal insulation, chemical and thermal stability, and high tensile strength. In addition to finding asbestos in older buildings, it is also found in its natural state (NOA).

Exposing or disturbing rock and soil that contains NOA can result in the release of fibers to the air, and consequently public exposure. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (or serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, termolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present.

Exposure and disturbance of rock and soil that contain asbestos can result in the release of fibers to the air and consequent exposure to the public. Asbestos can result in a human health hazard when airborne. The inhalation of asbestos fibers into the lungs can result in a variety of adverse health effects, including inflammation of the lungs, respiratory ailments (e.g., asbestosis, which is scarring of lung tissue that results in constricted breathing), and cancer (e.g., lung cancer and mesothelioma, which is cancer of the linings of the lungs and abdomen).

Greenhouse Gases

GHGs primarily generated by vehicle exhaust and fossil fuel combustion are carbon dioxide (CO_2), methane, and nitrous oxide. The Intergovernmental Panel on Climate Change (IPCC) estimates that CO_2 accounts for more than 75% of all anthropogenic (i.e., human-made) GHG emissions. Approximately 75% of anthropogenic CO_2 emissions are the result of fossil fuel burning; approximately 25% are the result of land use change (Intergovernmental Panel on Climate Change 2007). Methane is the second-largest contributor of anthropogenic GHG emissions and results from growing rice, raising cattle, combustion, and mining coal (National Oceanic and Atmospheric Administration 2005). Nitrous oxide, while not as abundant as CO_2 or methane, is a powerful GHG. Sources of nitrous oxide include agricultural processes, nylon production, fuel-fired power plants, nitric acid production, and vehicle emissions.

To simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the global warming potential methodology defined in the IPCC reference documents (Intergovernmental Panel on Climate Change 1996, 2001). The IPCC defines the global warming potential of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalent (CO_2e), which compare the gas in question to that of the same mass of CO_2 (CO_2 has a global warming potential of 1 by definition).

Table 4-1 lists the global warming potential of CO_2, methane, and nitrous oxide; their lifetimes; and abundances in the atmosphere in parts per trillion (ppt).

Table 4-1. Lifetimes and Global Warming Potentials of Several Greenhouse Gases

GHG	Global Warming Potential (100 years)	Lifetime (years)	1998 Atmospheric Abundance (ppt)[a]
CO_2	1	50–200	365,000,000
Methane	21	9–15	1,745
Nitrous oxide	310	120	314

Sources: Intergovernmental Panel on Climate Change 1996, 2001:388–390.

[a] 1 ppt is a mixing ratio unit indicating the concentration of a pollutant in ppt by volume.

A GHG inventory is a quantification of all GHG emissions and sinks within a selected physical and/or economic boundary. GHG inventories can be performed on a large scale (i.e., for global and national entities) or on a small scale (i.e., for a particular building or person). Although many processes are difficult to evaluate, several agencies have developed tools to quantify emissions from certain sources.

Table 4-2 outlines the most recent global, national, statewide, and local GHG inventories to help contextualize the magnitude of potential project-related emissions.

Table 4-2. Global, National, State, and Local GHG Emissions Inventories

Emissions Inventory	CO_2e (metric tons)
2004 IPCC Global GHG Emissions Inventory	49,000,000,000
2008 EPA National GHG Emissions Inventory	6,956,800,000
2008 ARB State GHG Emissions Inventory	477,700,000
2005 Sacramento County GHG Emissions Inventory	13,938,537
City of Citrus Heights Inventory	578,134
City of Elk Grove Inventory	842,971
City of Folsom Inventory	609,009
City of Rancho Cordova Inventory	557,943
City of Sacramento Inventory	4,553,051

Sources: Intergovernmental Panel on Climate Change 2007; U.S. Environmental Protection Agency 2010d; California Air Resources Board 2009; ICF Jones & Stokes 2009.

4.2.1.3 Existing Air Quality Conditions

Existing air quality conditions in the project area can be characterized in terms of the federal and state air quality standards, and by monitoring data collected in the region. The EPA and ARB maintain an extensive network of monitoring stations throughout California. Table 4-3 presents pollutant concentrations measured at the Elk Grove–Bruceville Monitoring, El Camino and Watt, and Branch Center Road Stations for the past 3 years for which complete data are available (2007–2009). These stations were selected based on their proximity to the project area. Table 4-3 indicates which pollutants are measured at each station because not all stations monitor for the same pollutants. Concentrations are typically measured in parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$).

As shown in Table 4-3, Sacramento County has experienced frequent violations of the state and federal ozone and PM10 standards.

Table 4-3. Pollutant Concentrations Measured at the Elk Grove–Bruceville, El Camino and Watt, and Branch Center Road Monitoring Stations

	Sacramento County		
Pollutant Standards	2007	2008	2009
1-Hour Ozone (Elk Grove–Bruceville)			
Maximum 1-hour concentration (ppm)	0.102	0.111	0.102
1-hour California designation value	0.110	0.110	0.100
1-hour expected peak day concentration	0.109	0.105	0.099
Number of days standard exceeded[a]			
CAAQS 1-hour (>0.09 ppm)	1	5	2
8-Hour Ozone (Elk Grove–Bruceville)			
National maximum 8-hour concentration (ppm)	0.087	0.093	0.086
National second-highest 8-hour concentration (ppm)	0.082	0.085	0.078
State maximum 8-hour concentration (ppm)	0.088	0.093	0.087
State second-highest 8-hour concentration (ppm)	0.083	0.085	0.079
8-hour national designation value	0.083	0.082	0.079
8-hour California designation value	0.096	0.093	0.085
8-hour expected peak day concentration	0.097	0.095	0.086
Number of days standard exceeded[a]			
NAAQS 8-hour (>0.075 ppm)	5	7	5
CAAQS 8-hour (>0.070 ppm)	13	13	12
Carbon Monoxide (El Camino and Watt)			
National maximum 8-hour concentration (ppm)[b]	3.20	2.84	2.84
National second-highest 8-hour concentration (ppm) [b]	2.96	2.60	2.84
California maximum 8-hour concentration (ppm)[c]	3.20	2.84	2.84
California second-highest 8-hour concentration (ppm)[c]	2.96	2.60	2.84
Maximum 1-hour concentration (ppm)	3.50	3.20	–
Second-highest 1-hour concentration (ppm)	3.10	2.80	–
Number of days standard exceeded[a]			
NAAQS 8-hour (≥9 ppm)	0	0	0
CAAQS 8-hour (≥9.0 ppm)	0	0	0
NAAQS 1-hour (≥35 ppm)	0	0	0
CAAQS 1-hour (≥20 ppm)	0	0	0
PM10[d] (Branch Center Road)			
National[b] maximum 24-hour concentration (μg/m³)[b]	70	71	45
National[b] second-highest 24-hour concentration (μg/m³)[b]	61	53	35
California maximum 24-hour concentration (μg/m³)[c]	75	72	48
California second-highest 24-hour concentration (μg/m³)[c]	66	57	38
California annual average concentration (μg/m³)[e]	20.7	23.2	18.7
Number of days standard exceeded[a]			
NAAQS 24-hour (>150 μg/m³)[f]	0	0	0
CAAQS 24-hour (>50 μg/m³)[f]	30	12	0

Pollutant Standards	Sacramento County 2007	2008	2009
PM2.5 (Elk Grove–Bruceville)			
National maximum 24-hour concentration (μg/m³)[b]	–	–	–
National second-highest 24-hour concentration (μg/m³)[b]	–	–	–
California maximum 24-hour concentration (μg/m³)[c]	57.7	83.3	41.0
California second-highest 24-hour concentration (μg/m³)[c]	48.2	79.2	39.3
National annual designation value (μg/m³)	–	–	–
National annual average concentration (μg/m³)	–	–	–
California annual designation value (μg/m³)	–	16.0	16.0
California annual average concentration (μg/m³)[e]	–	16.1	14.7
Number of days standard exceeded[a]			
NAAQS 24-hour (>35 μg/m³)[f]	–	–	–

Sources: California Air Resources Board 2010a; U.S. Environmental Protection Agency 2010b.

Notes: CAAQS = California ambient air quality standards.
NAAQS = national ambient air quality standards.
ppm = parts per million.
μg/m³ = micrograms per cubic meter.
– = insufficient data available to determine the value.

[a] An exceedance is not necessarily a violation.

[b] National statistics are based on standard conditions data. In addition, national statistics are based on samplers using federal reference or equivalent methods.

[c] State statistics are based on local conditions data, except in the South Coast Air Basin, for which statistics are based on standard conditions data. In addition, state statistics are based on California-approved samplers.

[d] Usually, measurements are collected every 6 days.

[e] State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.

[f] Mathematical estimate of how many days concentrations would have been measured as higher than the level of the standard had each day been monitored. Values have been truncated.

4.2.1.4 Regional Attainment Status

Local monitoring data (Table 4-3) are used to designate areas as nonattainment, maintenance, attainment, or unclassified for the national ambient air quality standards (NAAQS) and California ambient air quality standards (CAAQS). The four designations are further defined as follows:

- **Nonattainment**: Assigned to areas where monitored pollutant concentrations consistently violate the standard in question.
- **Maintenance**: Assigned to areas where monitored pollutant concentrations exceeded the standard in question in the past, but are no longer in violation of that standard.
- **Attainment**: Assigned to areas where pollutant concentrations meet the standard in question over a designated period of time.
- **Unclassified**: Assigned to areas where data are insufficient to determine whether a pollutant is violating the standard in question.

Table 4-4 summarizes the attainment status of Sacramento and El Dorado Counties with regard to the NAAQS and CAAQS.

Table 4-4. Federal and State Attainment Status of Sacramento and El Dorado Counties

	Sacramento County		El Dorado County	
Pollutant	NAAQS	CAAQS	NAAQS	CAAQS
1-hour ozone	–	Serious nonattainment	–	Serious nonattainment[b]
8-hour ozone	Serious nonattainment	Nonattainment	Serious nonattainment[b]	Nonattainment
CO	Moderate maintenance[a]	Attainment	Attainment[b]	Unclassified
PM2.5	Nonattainment	Nonattainment	Nonattainment[b]	Unclassified
PM10	Moderate nonattainment	Nonattainment	Attainment	Nonattainment

Sources: California Air Resources Board 2010b; U.S. Environmental Protection Agency 2010a.
Note: – = no applicable standard.
[a] Designation applies to a portion of the county.
[b] Designation applies to the portion of the county in which the project corridor is included.

4.2.1.5 Sensitive Receptors

The Sacramento Metropolitan Air Quality Management District (SMAQMD) identifies sensitive receptors as "facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants." Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors (Sacramento Metropolitan Air Quality Management District 2009a). Along the project corridor, sensitive receptors are most concentrated in defined communities, such as Franklin, Sheldon, Mather Air Force Base (see the discussion of alternative corridor alignments in Chapter 17), and El Dorado Hills. In addition, several single residences and subdivisions are also scattered north and west of the project corridor. Figure 12-1 in Chapter 12 shows the location of sensitive receptors within a 1-mile radius of the project corridor and alternative alignments (discussed in Chapter 17).

4.2.2 Regulatory Setting

4.2.2.1 Criteria Pollutants

The federal and state air quality management agencies of direct importance in the project area are the EPA and ARB, respectively. Within Sacramento and El Dorado Counties, the SMAQMD and the El Dorado County Air Pollution Control District (EDCAPCD), respectively, have jurisdiction over local air quality. These agencies either have regulatory authority or are responsible for the development and implementation of programs and plans designed to reduce air pollution levels.

Federal

The federal Clean Air Act (CAA), promulgated in 1963 and amended twice thereafter, including the 1990 Clean Air Act Amendments (CAAA), establishes the framework for modern air pollution control. The act directs the EPA to establish NAAQS for the six criteria pollutants discussed above. The NAAQS are summarized in Table 4-5. Most standards have been set to protect public health. For some pollutants, standards have been based on values such as protection of crops, protection of materials, or avoidance of nuisance conditions.

The CAA requires states to submit a state implementation plan (SIP) for areas in nonattainment for NAAQS. The SIP, which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits. In cases where an SIP is submitted but fails to demonstrate achievement of the NAAQS, the EPA is directed to prepare a federal implementation plan.

Table 4-5. Ambient Air Quality Standards Applicable in California

			Standard (parts per million)		Standard (micrograms per cubic meter)		Violation Criteria	
Pollutant	Symbol	Average Time	California	National	California	National	California	National
Ozone*	O_3	1 hour	0.09	–	180	–	If exceeded	–
		8 hours	0.070	0.075	137	147	If exceeded	If fourth-highest 8-hour concentration in a year, averaged over 3 years, is exceeded at each monitor within an area
Carbon monoxide	CO	8 hours	9.0	9	10,000	10,000	If exceeded	If exceeded on more than 1 day per year
		1 hour	20	35	23,000	40,000	If exceeded	If exceeded on more than 1 day per year
(Lake Tahoe only)		8 hours	6	–	7,000	–	If equaled or exceeded	–
Nitrogen dioxide	NO_2	Annual arithmetic mean	0.030	0.053	57	100	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.18	0.100	339	188	If exceeded	–
Sulfur dioxide	SO_2	Annual arithmetic mean	–	–	–	80	–	If exceeded
		24 hours	0.04	–	105	365	If exceeded	If exceeded on more than 1 day per year
		1 hour	0.25	0.075	655	–	If exceeded	–
Hydrogen sulfide	H_2S	1 hour	0.03	–	42	–	If equaled or exceeded	–
Vinyl chloride	C_2H_3Cl	24 hours	0.01	–	26	–	If equaled or exceeded	–
Inhalable particulate matter	PM10	Annual arithmetic mean	–	–	20	–	–	–
		24 hours	–	–	50	150	If exceeded	If exceeded on more than 1 day per year
	PM2.5	Annual arithmetic mean	–	–	12	15	–	If 3-year average from single or multiple community-oriented monitors is exceeded
		24 hours	–	–	–	35	–	If 3-year average of 98th percentile at each population-oriented monitor within an area is exceeded

Pollutant	Symbol	Average Time	Standard (parts per million) California	Standard (parts per million) National	Standard (micrograms per cubic meter) California	Standard (micrograms per cubic meter) National	Violation Criteria California	Violation Criteria National
Sulfate particles	SO_4	24 hours	–	–	25	–	If equaled or exceeded	–
Lead particles	Pb	Calendar quarter	–	–	–	1.5	–	If exceeded no more than 1 day per year
		30-day average	–	–	1.5	–	If equaled or exceeded	–
		Rolling 3-month average	–	–	–	0.15	If equaled or exceeded	Averaged over a rolling 3-month period

Source: California Air Resources Board 2010c.

State

Responsibility for achieving the CAAQS (Table 4-5) is placed on the ARB and local air districts, and is to be achieved through district-level air quality management plans that will be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to the ARB, which in turn has delegated that authority to individual air districts.

The ARB has traditionally established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving SIPs. Please refer to the following section for a discussion of SIPs approved by the SMAQMD and EDCAPCD, respectively.

The California CAA of 1988 substantially added to the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires them to prepare air quality plans, and grants them authority to implement transportation control measures (TCMs). The California CAA also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates the CAAQS. These clean air plans are specifically designed to attain these standards and must be designed to achieve an annual 5% reduction in district-wide emissions of each nonattainment pollutant or its precursors. Please refer to the following section for a discussion of air quality plans approved by the SMAQMD and EDCAPCD, respectively.

The California CAA requires that the state air quality standards be met as expeditiously as practicable, but unlike the federal CAA, it does not set precise attainment deadlines. Instead, it establishes increasingly stringent requirements for areas that will require more time to achieve the standards. In addition, the California CAA emphasizes the control of "indirect and area-wide sources" of air pollutant emissions and gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish TCMs.

Local

Sacramento Metropolitan Air Quality Management District

Most of the project corridor is located within the jurisdiction of the SMAQMD. As discussed above, under the California CAA, the SMAQMD is required to develop an air quality plan for nonattainment criteria pollutants within the air district. Counties within the Sacramento area (Sacramento, Yolo, and portions of Placer, El Dorado, Solano, and Sutter) have adopted the 2009 Sacramento Metropolitan Area 8-Hour Ozone Attainment Plan (2009 Ozone Plan) (Sacramento Valley Air Quality Engineering and Enforcement Professionals 2010). This plan outlines strategies to achieve the health-based ozone standard. The Sacramento region is also in the process of developing a plan to address PM.

The proposed project may be subject to the following SMAQMD rules. These rules have been adopted by the SMAQMD to reduce emissions throughout the district. Failure to comply with any applicable district rule would be a violation subject to district enforcement action. (California Air Resources Board 2010d.)

- **Rule 402 (Nuisance)**: Prohibits the discharge of air containments which cause injury, detriment, nuisance, or annoyance.
- **Rule 403 (Fugitive Dust)**: Regulates operations which periodically may cause fugitive dust.
- **Rule 404 (Particulate Matter)**: Limits the quantity of PM through concentration limits.
- **Rule 412 (Stationary Internal Combustion Engines):** Limits emissions of NO_x, CO, and non-methane hydrocarbons from stationary internal combustion engines. (If construction requires engines rated at more than 50 brake horsepower.)
- **Rule 453 (Cutback and Emulsified Asphalt Paving)**: Limits emissions of ROGs from the use of cutback and emulsified asphalt paving materials, paving, and maintenance operations.

El Dorado County Air Pollution Control District

The northernmost portion of the project corridor extends 3 miles past the Sacramento County/El Dorado County line and therefore falls within the jurisdiction of the EDCAPCD. As discussed above, counties within the Sacramento area, included El Dorado, have adopted the 2009 Ozone Plan and are currently drafting a plan to address PM. Similar to the SMAQMD, the EDCAPCD has established several rules to improve air quality within El Dorado County. The proposed project may be subject to the following EDCAPCD rules: (California Air Resources Board 2010d.)

- **Rule 205 (Nuisance)**: Prohibits the discharge of air containments which cause injury, detriment, nuisance, or annoyance.
- **Rule 207 (Particulate Matter)**: Limits the quantity of PM through concentration limits.
- **Rule 223 (Fugitive Dust)**: Limits the amount of PM and asbestos PM entrained in the atmosphere.
- **Rule 224 (Cutback and Emulsified Asphalt Paving Materials)**: Limits emissions of ROGs from the use of cutback and emulsified asphalt paving materials, paving, and maintenance operations.
- **Rule 233 (Stationary Internal Combustion Engines)**: Limits emissions of NO_x and CO from stationary internal combustion engines. (If construction requires engines rated at more than 50 brake horsepower.)

4.2.2.2 Greenhouse Gases and Climate Change

Climate change has only recently been widely recognized as an imminent threat to the global climate, economy, and population. Therefore, the climate change regulatory setting—nationally, statewide, and locally—is complex and evolving. This section identifies key legislation, executive orders, and relevant court cases relevant to the environmental assessment of project GHG emissions.

Federal

Endangerment Finding

On December 7, 2009, the EPA administrator found that current and projected concentrations of CO_2, methane, nitrous oxide, hydroflourocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) threaten the public health and welfare of current and future generations. Additionally, the administrator found that combined emissions of CO_2, methane, nitrous oxide, and HFCs from motor vehicles contribute to the atmospheric concentrations and thus to the threat of climate change. Although the endangerment finding in itself does not place requirements on industry, it was an important step in the EPA's process to regulate of GHGs.

President's Council on Environmental Quality Draft Guidance

On February 18, 2010, Nancy Sutley, chair of the President's Council on Environmental Quality (CEQ), issued a memorandum providing guidance on consideration of the effects of climate change and GHG emissions under NEPA (Sutley 2010). The draft guidance suggests that the effects of projects directly emitting GHGs in excess of 25,000 tons annually be considered in a qualitative and quantitative manner. The CEQ does not propose this reference as a threshold for determining significance, but as "a minimum standard for reporting emissions under the CAA." The draft guidance also recommends that the cumulative effects of climate change on the proposed project be evaluated. The draft guidance is still undergoing public comments and will not be effective until issued in final form (Sutley 2010).

National Tailpipe Standards

On April 1, 2010, the EPA and the National Highway Traffic Safety Administration announced the first national tailpipe standards for new cars and trucks sold in the United States. The program applies to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016, and requires these vehicles to meet combined average fuel economy of 35.5 miles per gallon. It is estimated that these standards will cut GHG emissions by 960 million metric tons over the lifetime of the vehicles (U.S. Environmental Protection Agency 2010c).

State

A variety of legislation has been enacted in California relating to climate change, much of which sets aggressive goals for GHG reductions within the state. The following key legislation is applicable to the proposed project.

Executive Order S-3-05

Under this Executive Order S-3-05, state agencies ordered to reduce California's GHG emissions to: 1) 2000 levels by 2010, 2) 1990 levels by 2020, and 3) 80% below the 1990 levels by 2050.

Assembly Bill 32: Global Warming Solutions Act of 2006

Assembly Bill (AB) 32 sets the same overall year 2020 GHG emissions reduction goals as Executive Order S-3-05, while further mandating that the ARB create a plan includes market mechanisms) and implement rules to achieve "real, quantifiable, cost-effective reductions" of GHGs. AB 32 further directs state agencies and the newly created state Climate Action Team to identify discrete early action GHG reduction measures. These actions were adopted in early 2010 and relate to truck efficiency, port electrification, tire inflation, and reduction of PFCs, propellants, and sulfur hexafluoride.

Climate Change Scoping Plan

The ARB's Climate Change Scoping Plan prepared pursuant to AB 32 contains the main strategies California will use to reduce GHG from business-as-usual emissions projected for 2020 back to 1990 levels (California Air Resources Board 2008). As part of the scoping plan, the ARB and other agencies are undertaking regulatory rule making, culminating in rule adoption by January 1, 2011, for reducing GHG emissions to achieve the emissions cap by 2020, although official adoption has not yet occurred at the time of this writing.

Executive Order S-01-07: Low Carbon Fuel Standard

Executive Order S-01-07 requires a 10% or greater reduction in the average fuel carbon intensity for transportation fuels in California regulated by the ARB.

Assembly Bill 1493 (Pavely): Greenhouse Gases, Chapter 200, Statutes of 2002

AB 1493 requires the ARB to adopt regulations to reduce GHG emissions from noncommercial passenger vehicles and light-duty trucks of model years 2009 and later. The regulations were adopted September 24, 2009.

Senate Bill 375 (Steinberg): Statutes of 2008

Senate Bill (SB) 375 requires regional transportation plans, developed by metropolitan planning organizations (MPOs), to incorporate a "sustainable communities strategy" in their regional transportation plans that will achieve GHG emission reduction targets set by the ARB. The targets established for the SACOG region are a 7% reduction by 2020 and a 16% reduction by 2035.

State CEQA Guidelines, As Amended in 2010

The State CEQA Guidelines require lead agencies to describe, calculate, or estimate the amount of GHG emissions resulting from a project. Moreover, the guidelines emphasize the necessity to determine potential climate change effects of the project and propose mitigation as necessary. The guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds, but require the preparation of an EIR if "there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with adopted regulations or requirements" (Section 15064.4).

Local

Sacramento Metropolitan Air Quality Management District

The SMAQMD's *Guide to Air Quality Assessment in Sacramento County* establishes analysis expectations with regard to GHG emissions in CEQA documents such as EIRs (Sacramento Metropolitan Air Quality Management District 2009a). The district recommends that an analysis of potential impacts of project-generated GHG emissions should include a description of GHGs, summary of existing regulations, and discussion of GHG emissions sources in the project area. The guidelines further state that the analysis quantifies the mass emissions associated with project construction and operation. Although the guidelines recommend that GHG emissions be quantified, they do not identify thresholds at which emissions are considered significant. Rather, they state that the lead agency should determine a threshold appropriate to the project using either thresholds adopted by other agencies or their own. Finally, the SMAQMD requires that CEQA documents make a conclusion about the significance of project-related GHG emissions and identify feasible mitigation measures to reduce those emissions.

El Dorado County Air Pollution Control District

The EDCAPCD's *Guide to Air Quality Assessment* does not currently contain any guidance for the analysis of climate change impacts (El Dorado County Air Pollution Control District 2002). Consultation with district staff indicates that guidance is forthcoming, but no date or timeline is currently available. In the meantime, use of the SMAQMD's guidance is recommended (Otani pers. comm.).

4.3 Impact and Mitigation Discussion

4.3.1 Thresholds of Significance

4.3.1.1 Criteria Air Pollutants

Based on State CEQA Guidelines Appendix G, an impact pertaining to air quality is considered significant if it would:

- conflict with or obstruct implementation of the applicable air quality plan;
- violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)[1];
- expose sensitive receptors to substantial pollutant concentrations; or
- create objectionable odors affecting a substantial number of people.

The guidelines further state that the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the determinations above. Both the SMAQMD and EDCAPCD have established quantitative thresholds for the evaluation of air quality impacts. Table 4-6 summarizes both agencies' significance thresholds.

[1] See Chapter 18 for a discussion of cumulative impacts.

Table 4-6. SMAQMD and EDCAPCD Thresholds of Significance

Pollutant	Application	SMAQMD	EDCAPCD
ROGs	Construction emissions	–	82 pounds per day
	Operational emissions	65 pounds per day	82 pounds per day
NO_x	Construction emissions	85 pounds per day	82 pounds per day
	Operational emissions	65 pounds per day	82 pounds per day
CO	Operational emissions	Exceedance of CAAQS	Exceedance of CAAQS
PM10 and PM2.5	Construction and operational emissions	Exceedance of CAAQS **or** of failure to implement emissions control practices	Exceedance of CAAQS

Sources: Sacramento Metropolitan Air Quality Management District 2009a; El Dorado County Air Pollution Control District 2002.

Note: – = no applicable threshold.

4.3.1.2 Greenhouse Gases

Based on 2010 State CEQA Guidelines Appendix G, an impact pertaining to climate change is considered significant if it would:

- conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing GHGs, or
- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

As discussed above, neither the SMAQMD nor EDCAPCD have established thresholds to define a "significant amount" of GHGs. Within the state, the Bay Area Air Quality Management District (BAAQMD), South Coast Air Quality Management District (SCAQMD), and San Joaquin Valley Air Pollution Control District (SJVAPCD) are the only agencies to have adopted GHG thresholds. Although un-adopted, Sacramento County has also proposed a per capita threshold for transportation projects (Table 4-7).

To evaluate significance, this analysis draws upon the adopted GHG thresholds in Table 4-7 to evaluate GHG emissions, as well as the project's consistency with applicable climate action plans and regulations. In accordance with the SMAQMD CEQA guidelines and scientific consensus regarding the cumulative nature of GHGs[2], the analysis includes a cumulative, rather than project-level, evaluation of climate change impacts in Chapter 18.

[2] Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants (such as ozone precursors), which are primarily pollutants of regional and local concern. Given their long atmospheric lifetimes (see Table 4-1), GHGs emitted by countless sources worldwide accumulate in the atmosphere. No single emitter of GHGs is large enough to trigger global climate change on its own. Rather, climate change is the result of the individual contributions of countless sources past, present, and future. Therefore, GHG impacts are inherently cumulatively.

Table 4-7. Adopted Greenhouse Gas Thresholds

Agency	Threshold	Application
BAAQMD	1,100 (metric tons/year) Compliance with GHG reduction strategy 4.6 metric tons/service population/year	Development projects (operational emissions)
	25,000 (metric tons/year)	Stationary source projects (operational emissions)
SCAQMD	10,000 (metric tons/year)	Stationary source projects (operational emissions)
SJVAPCD	Compliance with GHG reduction strategy Implementation of best performance standards 29% reduction in GHG emissions relative to business-as-usual conditions[a]	Development and stationary source projects (operational emissions)
Sacramento County (Draft)	4.56 metric tons per capita[b]	Transportation projects

Sources: Bay Area Air Quality Management District 2010; South Coast Air Quality Management District 2008; San Joaquin Valley Air Pollution Control District 2009; Sacramento County 2010d.

[a] Defined as emissions that would occur if no GHG mitigation measures were implemented.

[b] This threshold is based on a per capita approach. Consequently, it difficult to apply this threshold to the proposed project—there is not a means of identifying the population served by the project, particularly since the project is intended to provide a transportation link across the Sacramento and into El Dorado counties.

Climate Change Impacts on the Project

Climate change is a complex phenomenon that has the potential to alter local climatic patterns and meteorology. Although modeling indicates that climate change will result in sea level rise, changes in regional climate and rainfall, among other things, a high degree of scientific uncertainty still exists with regard to characterizing future climate characteristics and predicting how various ecological and social systems will react to any changes in the existing climate at the local level. Regardless of this uncertainty, it is widely understood that some form of climate change is expected to occur in the future. Consequently, the proposed project may be impacted by changing climatic conditions.

Appendix G of the CEQA Guidelines does not include an entry for the effects of climate change on projects. However, in its own words, "[t]he sample questions in this form are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance." The absence of an issue from Appendix G does not mean that it may not be meaningful to a particular project and therefore worthy of analysis (*Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 117 Cal.App.4th 590). Therefore, for completeness and informational purposes, a brief summary of anticipated regional changes in climate are provided below.

Several recent studies have attempted to characterize future climatic scenarios for the State. While specific estimates and statistics on the severity of changes vary, sources agree that the Sacramento Valley will witness warmer temperatures, increased heat waves, and changes in rainfall patterns.

Specifically, the California Energy Commission (CEC) estimates that average annual temperatures in the Valley will increase by approximately 1°C to 3°C between 2010 and mid-century. Climatic models also predict that between 2035 and 2064, the number of heat wave days will increase by more than 100, relative to the previous 30 year period between 2005 and 2034. Annual precipitation is expected to witness a declining trend, but remain highly variable, suggesting that the Sacramento Valley will be vulnerable to increased drought. Warmer temperatures and increased precipitation in the form of rain are expected to result in decreased snowpack in the Sierra Nevada. Such effects will translate into earlier snowmelt and increased potential for flooding as a result of insufficient reservoir capacity to retain earlier snowmelt. (Sacramento County 2010d; Intergovernmental Panel on Climate Change 2007; California Natural Resources Agency 2009; California Energy Commission 2009.)

Sea level rise during the next 50 years is expected to increase dramatically over historical rates. The CEC predicts that by 2050, sea level rise, relative to the 2000 level, ranges from 30 centimeters (cm) to 45 cm. Coastal sea level rise could result in saltwater intrusion to the delta and associated biological impacts in the Sacramento Valley. Changes in soil moisture and increased risk of wildfires may also dominate future climatic conditions in the project area. (Sacramento County 2010d; Intergovernmental Panel on Climate Change 2007; California Natural Resources Agency 2009; California Energy Commission 2009.)

The proposed project will likely be most affected by climatic changes that could comprise the structural integrity of the facility. Such events include extreme heat, flooding, changes in soil moisture, and fire hazards. For example, extreme heat events coupled with changes in soil moisture could lead to pavement breaks or cracks. Likewise, flooding could erode underlining earth, which may cause portions of the roadway to become unlevel. While these future climatic conditions pose a threat to the proposed project, the severity of the impact is currently unknown.

4.3.2 Approach and Methodology

This section describes potential air quality impacts that could result from implementation of the proposed project and optional project components. This evaluation of impacts is at a program level and enables the JPA to select a Connector corridor and move into more detailed planning and design. Components of the proposed project and optional project components will be subject to further project-level environmental review at a later time.

The land use and transportation network configurations assumed for the proposed project are described in Chapters 11 and 16, respectively. Section 15126 of the State CEQA Guidelines provides that the environmental setting "will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant." The environmental setting consists of existing physical conditions at the time the NOP is released or CEQA analysis is begun.

In 2010, the California Supreme Court clarified that "[n]either CEQA nor the CEQA Guidelines mandates a uniform, inflexible rule for determination of the existing conditions baseline. Rather, an agency enjoys the discretion to decide, in the first instance, exactly how the existing physical conditions without the project can most realistically be measured, subject to review, as with all CEQA factual determinations, for support by substantial evidence." The Court limited this flexibility by further stating that "[a]n approach using hypothetical allowable conditions as the baseline results in 'illusory' comparisons that 'can only mislead the public as to the reality of the impacts and subvert full consideration of the actual environmental impacts,' a result at direct odds with CEQA's intent."

(*Communities for a Better Environment v. South Coast Air Quality Management District* (2010) 48 Cal.4th 310.)

Past practice in traffic impact analysis undertaken to help determine the significance of a project's air quality impact has often relied upon a "future no-project" scenario as its CEQA baseline. The project's impact is derived from the difference between "future with-project" and "future no-project" scenarios. This approach has been used in the past because it offers a means of comparing with- and without-project scenarios that share common assumptions for future growth and improvements. It may not, however, conform to the *Communities for a Better Environment* decision. In fact, that approach was invalidated in late 2010 in the Sixth District Court of Appeal's decision in *Sunnyvale West Neighborhood Assn. v. City of Sunnyvale* (2010) __ Cal.App.4th __.

In recognition of the *Communities for a Better Environment* and *Sunnyvale West* decisions, the EIR for the Southeast Connector has not followed this past practice. For purposes of determining the impact on air quality in this EIR, the baseline is physical conditions along the Southeast Connector alignment as they existed in 2008. The data on existing traffic levels has been used to estimate existing air quality conditions based on standard modeling techniques. The estimated existing conditions are compared to the existing conditions with the project to determine the significance of the project's air quality impact. This approach complies with the intent of the *Communities for a Better Environment*, by providing a significance determination based on the change from existing conditions and avoiding the use of a hypothetical baseline condition.

Determining the significance of an impact by comparing anticipated project conditions to existing conditions in the area affected by the project is a relatively straightforward analysis for most impacts. However, the air quality impact of a project that will not be operational for years is not easily compared to existing conditions. By the time the Project is operational in 2025 there will be new infrastructure and background growth in the region unrelated to the project that will impact area roads. The 2025 traffic conditions modeled for the proposed project and used as the basis for the air quality analysis do not include reasonable assumptions about new infrastructure and background growth within the region. As a result, although this analysis provides a comparison between existing conditions and existing conditions with the Project in place, the resultant significance determination will likely overstate the extent of change in air quality conditions that is a direct result of the Project.

This EIR does not ignore the potential impacts that would occur under the "future with-project" scenario. The significance of the impacts of the "future with-project" scenario in comparison to the "future without-project" scenario is disclosed in the cumulative impact discussion in Chapter 18, Cumulative and Growth Inducing Impacts.

Buildout of the proposed project may include any of the following optional project components: Kammerer Road Bypass Option, Off-Corridor Multi-Use Path Option, Deer Creek Causeway Options 1 and 2, Reduced Access Roadway Option, and High Access Roadway Option. Construction emissions associated with these optional project components were evaluated in accordance with the methods outlined in Section 4.3.2.1.

Operational emissions associated with the proposed project and optional project components were evaluated based on the methods described in Section 4.3.2.2 and Appendix B. Operational emissions associated with the Kammerer Road Bypass Option and the Off-Corridor Multi-Use Path Alternative were not estimated because the traffic analysis (Chapter 16) found that they would have no discernable impacts on the transportation network and did not identify any differences in the operational data.

4.3.2.1 Construction Emissions

Although the approval of a project corridor at the conclusion of the program EIR process will not immediately lead to project construction, estimates of the type of equipment were made in this program EIR analysis for purposes of calculating eventual project construction impacts related to air quality. Construction emissions were estimated using the SMAQMD's Road Construction Emissions Model (Version 6.3.2). The road construction model is a public-domain spreadsheet model formatted as a series of individual worksheets. The model enables users to estimate emissions using a minimum amount of project-specific information. The model estimates emissions for load hauling (on-road heavy-duty vehicle trips), worker commute trips, construction site fugitive dust (PM10 and PM2.5), and off-road construction vehicles.

This analysis is based on anticipated construction equipment calculated by the Road Construction Emissions Model, which estimates construction equipment based on project size, duration of construction activities, and level of daily construction activities. Although exhaust emissions are estimated for each activity, fugitive dust estimates are currently limited to major dust-generating activities, which include grubbing/land clearing and grading/excavation. Table 4-8 outlines the modeling inputs used to quantify construction emissions.

Table 4-8. Modeling Assumptions to Quantify Construction Emissions

Proposed Project and Optional Project Component	Project Length (miles)	Acreage Disturbed[a]	Maximum Acreage Disturbed per Day[b]
Proposed Project with Reduced Access Roadway	33.5	1,471	368
Proposed Project with Deer Creek Causeway Option 1	35.8	1,403	351
Proposed Project with Deer Creek Causeway Option 2	35.8	1,427	357
Proposed Project with High Access Roadway	33.5	1,477	369
Proposed Project with Off-Corridor Multi-Use Path[c]	63.5	1,554	388
Proposed Project with Kammerer Road Bypass	34.3	1,476	369

[a] Assumes alignment footprint plus 50 feet on either side for construction staging. Calculated using ArcGIS.

[b] A default assumption of 25% the total acreage was assumed based on guidance found in the SMAQMD CEQA guidelines (Sacramento Metropolitan Air Quality Management District 2009a). The maximum daily acreage under mitigated conditions is assumed to be 15 acres, based on Mitigation Measure AQ-2 (see below).

[c] Off-corridor trail assumed to have a total disturbance area of 84.8 acres.

To determine the portion of emissions occurring within the SMAQMD and EDCAPCD, total emissions were multiplied by the ratio of roadway constructed within each air district. It was assumed that regardless of the total length with the various optional project components, 3 miles of the roadway would be constructed within the EDCAPCD. Consequently, modeled emissions were multiplied by the ratios presented in Table 4-9.

Table 4-9. Percent of Roadway to Be Constructed within the SMAQMD and EDCAPCD[a]

Proposed Project and Optional Project Component	Percent in SMAQMD	Percent in EDCAPCD
Proposed Project with Reduced Access Roadway	91.05%	8.95%
Proposed Project with Deer Creek Causeway Option 1	91.61%	8.39%
Proposed Project with Deer Creek Causeway Option 2	91.63%	8.37%
Proposed Project with High Access Roadway	91.05%	8.95%
Proposed Project with Off-Corridor Multi-Use Path[b]	90.56%	9.44%
Proposed Project with Kammerer Road Bypass	91.25%	8.75%
No Project[c]	91.05%	8.95%

[a] Three miles of the total roadway length (Table 4-8) are assumed to be constructed in the EDCAPCD, unless otherwise stated.

[b] Three miles of the total off-trail length are assumed to constructed in the EDCAPCD.

[c] Only for operational emissions analysis (see below).

4.3.2.2 Operational Emissions

The analysis of air quality impacts under existing (2008) and future (2025 and 2035) conditions employed slightly different methodologies due to constraints associated with the available traffic data. A brief methods overview is presented below. However, for more detailed information, please refer to Appendix B.

Future Conditions (2025 and 2035)

Operational emissions for the Reduced Access Roadway Option, Deer Creek Causeway Options 1 and 2, and High Access Roadway Option were quantified using the most recent approved methodologies and models. The effects of criteria pollutants (ozone precursors, CO, PM10, and PM2.5) were quantified with Caltrans' CT-EMFAC emissions model (Version 2.6) and traffic data provided by the project traffic engineers, DKS (Fugitt pers. comm.). The effects of localized CO hotspot emissions were evaluated through CO dispersion modeling using the *Transportation Project-Level Carbon Monoxide Protocol* developed for Caltrans by the Institute of Transportation Studies at the University of California, Davis (Garza et al. 1997). An analysis of potential health risks associated with exposure of sensitive receptors to DPM was conducted using the CAL3QHCR dispersion model and the SMAQMD's *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways* (Sacramento Metropolitan Air Quality Management District 2010).

Existing Conditions (2008)

Pollutant emissions were estimated under the "no project" and the proposed project with Reduced Access Roadway Option using traffic data provided by the traffic engineers (Long pers. comm.). This design option was identified as having the worst traffic impacts in the Chapter 16. However, although related, the severity of traffic impacts is not directly commensurate with air quality impacts on a one to one ratio due to other compounding factors, such as vehicle speed and type, that also influence vehicle emissions. In fact, the analysis of air quality impacts completed under future conditions (2025 and 2035) identified both the Reduced Access Roadway Option and the Deer Creek Causeway Option 1 as having the highest emissions. Thus an analysis of both design options was undertaken using the assumptions outlined in Appendix B to evaluate a worst-case scenario relating to air quality emissions.

While the Future Conditions analysis evaluated six intersections (White Rock Road/Latrobe Road, White Rock Road/Off-Vehicle Road, Teichert [local road]/Grant Line Road, SR 99 Northbound ramps/Grant Line Road, East Bidwell Road/Iron Point Road, and Scott Road/Easton Valley Parkway), the effects of localized CO hotspot emissions under existing conditions were analyzed at the intersection of East Bidwell Road and Iron Point Road. This intersection was selected as the traffic data indicates that it is the only intersection that will experience higher delay and/or LOS with implementation of the project under existing conditions, as four of the other five intersections will experience operational improvements and the remaining intersection does not exist under existing no project" and proposed project conditions. The traffic data required to conduct a CO analysis was only available for the no project alternative and the design option with the highest average daily traffic (ADT). Based on ADT provided under future conditions, this option was assumed to be the High Access Roadway. Appendix B presents a detailed methodology used in the CO analysis.

An analysis of potential health risks associated with exposure of sensitive receptors to DPM was conducted for the "no project" condition and the High Access Roadway using the CAL3QHCR dispersion model and the SMAQMD's *Recommended Protocol for Evaluating the Location of Sensitive Land Uses Adjacent to Major Roadways* (Sacramento Metropolitan Air Quality Management District 2010).

4.3.3 Impacts of the Proposed Project

Implementation of the proposed project will generate short-term construction emissions from construction and long-term operational emissions from vehicle travel on the project corridor. Because the specific components to be included in the project have not been selected, traffic data required to provide a quantitative analysis of the air quality impacts that could result from operation of the project is not available. Rather, the available data consisted of traffic volumes for the proposed project with the various optional project components. Consequently, a quantitative analysis of operational air quality impacts from the proposed project is not possible and a qualitative assessment was conducted. For consistency, construction impacts are also discussed qualitatively.

Consistent with the availability of the traffic data, the impacts of the proposed project with optional project components are discussed in combination below. As shown in Impact AQ-2, all optional project components will generate construction and operational NO_x emissions in excess of the SMAQMD thresholds. In addition, the proposed project with the Reduced Access Roadway will exceed the District's operational ROG threshold. None of the optional project components will result in impacts on sensitive receptors or generate odors, and impacts under the proposed project alone would be similar to those for the proposed project in combination with optional project components. Consequently, it reasonable to conclude that construction and operational NO_x emissions will exceed the SMAQMD thresholds.

Impact AQ-1: Conflict with or Obstruct Implementation of the Applicable Air Quality Plan

A project is deemed inconsistent with air quality plans if it would result in population or employment growth that exceeds growth estimates included in the applicable air quality plan, which in turn would generate emissions not accounted for in the applicable air quality plan emissions budget. Because these emissions budgets are developed using growth projections outlined in the applicable local and regional planning documents, any conflicts with area general or transportation plans would constitute a conflict with the applicable air quality plan.

As discussed in Chapter 11, the proposed project and optional project components would not conflict with the planning assumptions in the Sacramento County, El Dorado County, Elk Grove, Rancho Cordova, and Folsom General Plans. The proposed project and optional project components is generally consistent with MTP 2035. Since publication of MTP 2035, the project scope has changed to include a reduced number of lanes and roadway extensions (see Chapter 16). Although these designs are not included in MTP 2035, they do represent reductions in the project scope, so they are not anticipated to result in any impacts greater than those identified for MTP 2035, and would likely result in smaller impacts than those identified in the MTP 2035 due to the reduced project elements reflected as part of the proposed project and optional project components. Therefore, the proposed project and optional project components are not considered to conflict with the growth projections or emissions analyses assumed by MTP 2035 and would not conflict with or obstruct implementation of the applicable air quality plan. This impact is considered less than significant.

Impact AQ-2: Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

Construction Emissions

Implementation of the project would result in new roadway alignments and improvements, as well as the addition of traffic lanes. Temporary construction emissions would result from grubbing/land clearing, grading/excavation, drainage/utilities/subgrade construction, 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's Road Construction Emissions Model (Version 6.3.2) was used to estimate construction-related ozone precursor (ROG and NO_x), CO, PM10, PM2.5, and C O_2 emissions. The estimate assumes that construction would begin in 2015 and last approximately 10 years. Construction of the all design options would include the use of water trucks and an assumed import and export of 500 cubic yards of soil per day. Tables 4-10 and 4-11 summarize the modeled emissions within the SMAQMD and EDCAPCD, respectively.

Based on Tables 4-10 and 4-11, implementation of all optional project components would generate NO_x emissions in excess of the SMAQMD significance threshold. These emissions are primarily the result of diesel-powered construction equipment. In addition, the emissions of PM10 and PM2.5 shown in Tables 4-10 and 4-11 do not include implementation of SMAQMD dust control measures and assume a daily disturbance of more than 15 acres. This is a potentially significant impact. Mitigation Measures AQ-1 and AQ-2 are required to reduce fugitive dust emissions, and Mitigation Measures AQ-3 and AQ-4 are required to reduce NO_x emissions. Mitigated emissions are presented below in Tables 4-12 and 4-13. Implementation of Mitigation Measures AQ-1 through AQ-4 would reduce the impact to a less-than-significant level.

Table 4-10. Summary of Unmitigated Construction Emissions within the SMAQMD (pounds per day)

Proposed Project and Optional Project Component	ROGs	NO_x	CO	PM10 Total	PM10 Exhaust	PM10 Dust	PM2.5 Total	PM2.5 Exhaust	PM2.5 Dust
Proposed Project with Reduced Access Roadway	21.95	126.47	172.44	676.76	7.18	669.58	145.68	6.41	139.27
Proposed Project with Deer Creek Causeway Option 1	22.15	127.83	173.59	649.98	7.25	642.74	140.14	6.46	133.69
Proposed Project with Deer Creek Causeway Option 2	22.16	127.99	173.63	661.12	7.25	653.87	142.46	6.46	136.01
Proposed Project with High Access Roadway	21.95	126.48	172.44	679.49	7.18	672.31	146.25	6.41	139.84
Proposed Project with Off-Corridor Multi-Use Path	22.77	139.25	172.68	711.03	7.42	703.61	152.84	6.49	146.35
Proposed Project with Kammerer Road Bypass	22.02	127.06	172.85	680.45	7.20	673.24	146.46	6.42	140.03
SMAQMD Threshold	–	*85*	–	–	–	–[a]	–	–	–[a]

[a] Exceedance of CAAQS or failure to implement emissions control practices and disturb more than 15 acres per day.

Table 4-11. Summary of Unmitigated Construction Emissions within the EDCAPCD (pounds per day)

Proposed Project and Optional Project Component	ROGs	NO_x	CO	PM10 Total	PM10 Exhaust	PM10 Dust	PM2.5 Total	PM2.5 Exhaust	PM2.5 Dust
Proposed Project with Reduced Access Roadway	2.16	12.43	16.95	66.52	0.71	65.82	14.32	0.63	13.69
Proposed Project with Deer Creek Causeway Option 1	2.03	11.71	15.90	59.53	0.66	58.86	12.83	0.59	12.24
Proposed Project with Deer Creek Causeway Option 2	2.02	11.69	15.86	60.39	0.66	59.73	13.01	0.59	12.42
Proposed Project with High Access Roadway	2.16	12.43	16.95	66.79	0.71	66.09	14.38	0.63	13.75
Proposed Project with Off-Corridor Multi-Use Path	2.37	14.52	18.00	74.12	0.77	73.34	15.93	0.68	15.26
Proposed Project with Kammerer Road Bypass	2.11	12.18	16.57	65.25	0.69	64.56	14.04	0.62	13.43
EDCAPCD Threshold	*82*	*82*	–	–	–	–[a]	–	–	–[a]

[a] Exceedance of CAAQS.

Table 4-12. Summary of Mitigated Construction Emissions within the SMAQMD (pounds per day)

Proposed Project and Optional Project Component	ROGs	NO_x	CO	PM10			PM2.5		
				Total	Exhaust	Dust	Total	Exhaust	Dust
Proposed Project with Reduced Access Roadway	9.39	56.11	71.28	139.70	3.12	136.58	31.08	2.67	28.41
Proposed Project with Deer Creek Causeway Option 1	9.52	57.15	71.80	140.58	3.16	137.42	31.28	2.69	28.58
Proposed Project with Deer Creek Causeway Option 2	9.52	57.19	71.82	140.61	3.16	137.45	31.28	2.69	28.59
Proposed Project with High Access Roadway	9.39	56.11	71.28	139.70	3.12	136.58	31.08	2.67	28.41
Proposed Project with Off-Corridor Multi-Use Path	10.28	66.31	72.06	139.26	3.42	135.84	31.02	2.77	28.25
Proposed Project with Kammerer Road Bypass	9.43	56.47	71.46	140.01	3.13	136.88	31.15	2.68	28.47
SMAQMD Threshold	–	*85*	–	–	–	–[a]	–	–	–[a]

[a] Exceedance of CAAQS or failure to implement emissions control practices and disturb more than 15 acres per day.

Table 4-13. Summary of Mitigated Construction Emissions within the EDCAPCD (pounds per day)

Proposed Project and Optional Project Component	ROGs	NO_x	CO	PM10			PM2.5		
				Total	Exhaust	Dust	Total	Exhaust	Dust
Proposed Project with Reduced Access Roadway	0.92	5.52	7.01	13.73	0.31	13.43	3.05	0.26	2.79
Proposed Project with Deer Creek Causeway Option 1	0.87	5.23	6.58	12.87	0.29	12.59	2.86	0.25	2.62
Proposed Project with Deer Creek Causeway Option 2	0.87	5.22	6.56	12.84	0.29	12.56	2.86	0.25	2.61
Proposed Project with High Access Roadway	0.92	5.52	7.01	13.73	0.31	13.43	3.05	0.26	2.79
Proposed Project with Off-Corridor Multi-Use Path	1.07	6.91	7.51	14.52	0.36	14.16	3.23	0.29	2.95
Proposed Project with Kammerer Road Bypass	0.90	5.41	6.85	13.43	0.30	13.13	2.99	0.26	2.73
EDCAPCD Threshold	*82*	*82*	–	–	–	–[a]	–	–	–[a]

[a] Exceedance of CAAQS.

Mitigation Measure AQ-1: Implement SMAQMD Basic Construction Emission Control Practices to Reduce Fugitive Dust

The JPA or local agency will require, as a standard or specification of their contract, the construction contractor(s) to implement basic control measures to reduce construction-related fugitive dust. Although the following measures are outlined in the SMAQMD's CEQA guidelines, they are required for the entirety of the construction area, including the segment within the EDCAPCD.

- Water all exposed surfaces two times daily. Exposed surfaces include (but are not limited to) soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Cover or maintain at least 2 feet of freeboard space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that would be traveling along freeways or major roadways should be covered.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Limit vehicle speeds on unpaved roads to 15 miles per hour.
- All roadway, driveway, sidewalk, and parking lot paving should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.

Mitigation Measure AQ-2: Limit Maximum Daily Disturbed Area to 15 Acres

The JPA or local agency will require, as a standard or specification of their contract, that the construction contractor(s) limit the maximum daily disturbed area to 15 acres. Although this measure is outlined in the SMAQMD's CEQA guidelines, it is required for the entirety of the construction area, including the segment within the EDCAPCD.

Mitigation Measure AQ-3: Implement SMAQMD Basic Construction Emission Control Practices to Reduce NO_x Emissions

The JPA or local agency will require, as a standard or specification of their contract, that the construction contractor(s) implement basic control measures to reduce NO_x emissions from diesel-powered construction equipment. Although the following measures are outlined in SMAQMD's CEQA guidelines, they will be required by the SMAQMD and EDCAPCD for the entirety of the construction area.

- Minimize idling time either by shutting equipment off when not in use or limiting the time of idling to 3 minutes (5 minutes required by 13 CCR 2449[d][3], 2485). Provide clear signage that posts this requirement for workers at the entrances to the site.
- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by a certified mechanic and determined to be running in proper condition before it is operated.

Mitigation Measure AQ-4: Implement SMAQMD Enhanced Construction Emission Control Practices to Reduce NO_x Emissions

The JPA or local agency will require, as a standard or specification of their contract, that the construction contractor(s) implement enhanced control measures to reduce NO_x emissions from diesel-powered construction equipment. The following measures are outlined in SMAQMD's CEQA guidelines and are required for the entirety of the construction area, including the segment within the EDCAPCD.

- Provide a plan for approval by the SMAQMD demonstrating that the heavy-duty (50-horsepower or more) off-road vehicles to be used in the construction project, including owned, leased, and subcontractor vehicles, will achieve a project-wide fleet-average 20% NO_x reduction and 45% PM exhaust reduction compared to the most recent ARB fleet average. Acceptable options for reducing emissions may include use of late-model engines, low-emission diesel products, alternative fuels, engine-retrofit technology, after-treatment products, or other options as they become available.
- Ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0[3]) will be repaired immediately. Non-compliant equipment will be documented and a summary provided monthly to the lead agency and air district. A visual survey of all in-operation equipment will be made at least weekly by the proponent agency(s), and a monthly summary of the visual survey results will be submitted throughout the duration of the proposed project, except that the monthly summary will not be required for any 30-day period in which no construction activity occurs. The monthly summary will include the quantity and type of vehicles surveyed, as well as the dates of each survey. The air districts or other officials may conduct periodic site inspections to determine compliance. Nothing in this measure will supersede other air district or state rules or regulations.

Operational Emissions

Long-term air quality impacts are those associated with motor vehicles operating on the roadway network, predominantly those operating in the project vicinity. Emissions of ROGs, NO_x, CO, PM10, PM2.5, and CO_2 for existing (2008), open-to-traffic year (2025), and design-year (2035) conditions were evaluated using Caltrans' CT-EMFAC model and traffic data provided by the traffic engineers (Appendix B; Long pers. comm.). To determine the portion of emissions occurring within the SMAQMD and EDCAPCD, total emissions were multiplied by the ratio of roadway constructed within each district (Table 4-9).

Tables 4-14 and 4-15 summarize the modeled yearly emissions within the SMAQMD and EDCAPCD, respectively. The differences in emissions between baseline and with-project conditions represent emissions generated directly as a result of implementation of the proposed project and optional project components. Vehicular emission rates, in general, are anticipated to decline in future years because of continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

[3] Based on the Ringelmann scale, which measures the density of smoke in the air.

Table 4-14. Summary of Operational Emissions within the SMAQMD

		Pounds per Day[a]					
Scenario	Yearly VMT	ROGs	NO_x	CO	PM10	PM2.5	CO_2[a]
Existing (2008)[b]	2,952,395,521	4,555	10,850	65,283	337	311	1,183,167
2008 Proposed Project with Reduced Access Roadway[b]	3,003,765,035	4,577	11,045	66,195	339	313	1,197,463
2008 Proposed Project with Deer Creek Causeway Option 1[b]	3,031,417,394	4,626	11,210	66,896	342	317	1,211,169
2025 No-Project[b]	4,445,564,911	2,164	3,894	26,566	409	372	1,756,192
2025 Proposed Project with Reduced Access Roadway[b]	4,514,236,187	2,194	3,983	26,946	415	378	1,787,024
2025 Proposed Project with Deer Creek Causeway Option 1[b]	4,557,119,012	2,216	4,043	27,211	420	382	1,807,465
2025 Proposed Project with Deer Creek Causeway Option 2[b]	4,556,538,985	2,214	4,023	27,196	419	382	1,804,362
2025 Proposed Project with High Access Roadway[b]	4,512,638,000	2,193	3,981	26,938	415	378	1,785,994
2035 No-Project[b]	5,161,850,674	1,764	2,843	24,002	466	432	2,020,727
2035 Proposed Project with Reduced Access Roadway[b]	5,233,810,825	1,790	2,902	24,341	473	438	2,054,279
2035 Proposed Project with Deer Creek Causeway Option 1[b]	5,281,992,760	1,809	2,946	24,598	478	443	2,077,792
2035 Proposed Project with Deer Creek Causeway Option 2[b]	5,281,167,639	1,807	2,931	24,576	477	442	2,073,776
2035 Proposed Project with High Access Roadway[b]	5,231,063,100	1,791	2,901	24,335	473	438	2,054,475
Emissions Specific to the Optional Project Components							
2008 Proposed Project with Reduced Access Roadway	51,369,513	22	195	913	2	2	14,296
2008 Proposed Project with Deer Creek Causeway Option 1	79,021,872	71	361	1,613	5	5	28,002
2025 Proposed Project with Reduced Access Roadway	68,671,276	30	89	380	6	6	30,832
2025 Proposed Project with Deer Creek Causeway Option 1	111,554,100	52	149	645	11	10	51,273
2025 Proposed Project with Deer Creek Causeway Option 2	110,974,073	50	129	630	10	9	48,170
2025 Proposed Project with High Access Roadway	67,073,089	29	87	372	6	6	29,802
2035 Proposed Project with Reduced Access Roadway	71,960,151	26	59	339	7	6	33,552
2035 Proposed Project with Deer Creek Causeway Option 1	120,142,086	45	103	596	12	11	57,065
2035 Proposed Project with Deer Creek Causeway Option 2	119,316,965	43	88	574	11	10	53,049
2035 Proposed Project with High Access Roadway	69,212,426	27	58	333	7	7	33,748
SMAQMD Threshold	–	*65*	*65*	–	–	–	–

Note: Please refer to Appendix B for modeling procedures.

[a] CO_2 emissions are presented in metric tons per year.

[b] Represents emissions associated with traffic generated by both the project option and development in the study area.

[c] Represents emissions associated with just the project option, as calculated by the following equation: Proposed Project with Project Option minus No Project

Table 4-15. Summary of Operational Emissions within the EDCAPCD

		Pounds per Day[a]					
Scenario	Yearly VMT	ROGs	NO_x	CO	PM10	PM2.5	CO_2[a]
Existing (2008)[b]	290,390,039	448	1,067	6,421	33	31	116,373
2008 Proposed Project with Reduced Access Roadway[b]	295,263,010	450	1,086	6,507	33	31	117,708
2008 Proposed Project with Deer Creek Causeway Option 1[b]	277,628,992	424	1,027	6,127	31	29	110,924
2025 No Project [b]	437,254,344	213	383	2,613	40	37	172,735
2025 Proposed Project with Reduced Access Roadway[b]	443,738,758	216	391	2,649	41	37	175,660
2025 Proposed Project with Deer Creek Causeway Option 1[b]	417,358,678	203	370	2,492	38	35	165,535
2025 Proposed Project with Deer Creek Causeway Option 2[b]	416,219,920	202	367	2,484	38	35	164,821
2025 Proposed Project with High Access Roadway[b]	443,581,660	216	391	2,648	41	37	175,559
2035 No Project[b]	507,706,371	174	280	2,361	46	42	198,754
2035 Proposed Project with Reduced Access Roadway[b]	514,471,245	176	285	2,393	46	43	201,931
2035 Proposed Project with Deer Creek Causeway Option 1[b]	483,745,435	166	270	2,253	44	41	190,292
2035 Proposed Project with Deer Creek Causeway Option 2[b]	482,411,581	165	268	2,245	44	40	189,430
2035 Proposed Project with High Access Roadway[b]	514,201,150	176	285	2,392	47	43	201,950
Emissions Specific to the Optional Project Components[c]							
2008 Proposed Project with Reduced Access Roadway	4,872,972	2	18	86	0	0	1,335
2008 Proposed Project with Deer Creek Causeway Option 1	-12,761,047	-24	-40	-294	-2	-2	-5,450
2025 Proposed Project with Reduced Access Roadway	6,484,414	3	8	36	1	1	2,926
2025 Proposed Project with Deer Creek Causeway Option 1	-19,895,665	-10	-13	-121	-2	-2	-7,200
2025 Proposed Project with Deer Creek Causeway Option 2	-21,034,423	-11	-16	-129	-2	-2	-7,914
2025 Proposed Project with High Access Roadway	6,327,316	3	8	35	1	1	2,824
2035 Proposed Project with Reduced Access Roadway	6,764,874	2	6	32	1	1	3,177
2035 Proposed Project with Deer Creek Causeway Option 1	-23,960,936	-8	-10	-108	-2	-2	-8,461
2035 Proposed Project with Deer Creek Causeway Option 2	-25,294,790	-8	-12	-116	-2	-2	-9,323
2035 Proposed Project with High Access Roadway	6,494,779	3	6	31	1	1	3,197
ECAPCD Threshold	–	*82*	*82*	–	–	–	–

Note: Please refer to Appendix B for modeling procedures.

[a] CO_2 emissions are presented in metric tons per year.

[b] Represents emissions associated with traffic generated by both the project option and development in the study area.

[c] Represents emissions associated with just the project option, as calculated by the following equation: Proposed Project with Project Option minus No Project

Based on Tables 4-14 and 4-15, implementation of the proposed project and optional project components would result in a net increase in all criteria pollutants within the SMAQMD under both existing (2008) and future (2025 and 2035) conditions. Within the EDCAPCD, implementation of the proposed project with the Reduced Access Roadway and High Access Roadway would result in slight increases in emissions, while implementation of the proposed project with the Deer Creek Causeway Options 1and 2 would have minor decreases.[4]

As discussed above, the significance conclusion is based on a comparison of emissions for the proposed project to the no project alternative under existing conditions (2008). Table 4-14 indicates that NO_x emissions in the SMAQMD are expected to exceed the district's threshold of significance under both the proposed project with the Reduced Access Roadway and the Deer Creek Causeway Option 1. Implementation the proposed project with the Deer Creek Causeway Option 1 will also exceed the district's threshold for ROG. While other design options were not modeled due to constraints associated with the available traffic data, the proposed project with Deer Creek Causeway Option 1 is expected to result in the highest emissions. This assumption is based on the analysis of future conditions, which indicates that the Deer Creek Causeway Option 1 has the highest traffic volumes and emissions in the SMAQMD. This approach further assumes that the ratio of emissions amongst the design options will remain constant between existing and future conditions, as design elements associated with the proposed project and optional project components are the same for existing and future conditions. Emissions for all other design options will therefore likely be lower than those expected under the proposed project with the Deer Creek Causeway Option 1.

Criteria pollutant emissions in the EDAPCD are not expected to exceed the district's significance thresholds. As discussed above, emissions under existing conditions were only modeled for the proposed project with the Reduced Access Roadway and the Deer Creek Causeway Option 1 due to constraints associated with the available traffic data. However, the proposed project with the Reduced Access Roadway is expected to result in the highest emissions as traffic volumes under future conditions indicate that this option would result in the highest volumes in the EDPACD. Emissions for all other design options will therefore likely be lower than those expected under the proposed project with the Reduced Access Roadway.

Emissions increases within the study area are attributable to increased VMT induced by construction of the new roadway. It should be noted that traffic patterns affected by the proposed project and optional project components will differ throughout the project corridor. As shown in Figures 16-8 through 16-11 in Chapter 16, the proposed project with all optional project components would decrease daily traffic volumes on many arterial/collector roadway segments and on portions of US 50, SR 99, and I-5. However, daily volumes are excepted to increase on the Connector (Kammerer Road, Grant Line Road, and the portion of White Rock Road east of Grant Line Road) and on most major roadways that provide access to the Connector.

Although Figures 16-8 through 16-11 depict changes in daily traffic volumes, it is likely that VMT along these roadways will show similar increases and decreases. However, because VMT data, which

[4] Scaling emissions by the ratio of constructed roadway in each air district affects the comparison of project-related emissions to the no project alternative for each optional project component. Because the percentage of roadway construction in the EDCAPCD is less under the proposed project with Deer Creek Causeway Options 1 and 2 compared to the No-Build Alternative (Table 4-8), scaled VMT and emissions are likewise less under the design options. The ratio of constructed roadway was used as a proxy for overall VMT in the SMAQMD and EDCAPCD as more specific traffic data were not available. Although this approach may generalize actual emissions within each district, it represents a good-faith effort based on the existing traffic data.

are required to quantify emissions, along these roadways are not available, a segment-by-segment emissions analysis is not possible.

However, to further evaluate the effects of the project and options on congestion and emissions, an additional analysis at link level was undertaken to estimate changes in VMT and associated fuel consumption in the project alignment area. The Synchro traffic simulation model was used to evaluate traffic operations along the proposed project alignment. The simulation model tracks individual vehicles on the proposed project alignment and their acceleration/deceleration and delay at signals, allowing fuel consumption to be estimated. As emissions are directly related to fuel consumption, one can infer effects to air quality emissions based on changes in fuel consumption associated with the proposed project and options. See Appendix B for a detailed description of the additional analysis. The additional Synchro analysis found that change in regional fuel consumption would be less than 0.06 percent for any of the project options along the proposed project alignment. Consequently, while Tables 4-14 and 4-15 show substantial increases in VMT and emissions associated with the proposed project and options, the results of the Synchro analysis, which provides a more complete analysis of the effects of congestion on network operation, indicates that the project and options may result in a smaller increase in VMT and emissions than those identified in Tables 4-14 and 4-15. While the results of the Synchro model and Tables 4-14 and 4-15 cannot be directly compared due to limitations inherent in the Synchro modeling analysis, it does provide a more complete snapshot of the congestion-relief benefits of the project and it's affect on fuel consumption and air quality emissions, and it is likely that the actual effects of the project to VMT and emissions lie in the middle of the Synchro results and those presented in Tables 4-14 and 4-15. The traffic data used in this analysis account for transit improvements approved by the JPA, including increased park-and-ride facilities, transit signal priority, and selected transit queue jumps on "high bus" routes. These features are commonly employed to reduce emissions from vehicle travel. Thus, there are no additional feasible mitigation measures that can be employed by the project to reduce NO_X and ROG emissions, as reduction features have already been accounted for in the traffic analysis. Moreover, given the mass amount of emissions identified in Table 4-15, it is unlikely that any additional mitigation would reduce emission below the SMAQMD's threshold. Thus, this impact is considered significant and unavoidable.

Carbon Monoxide Hot Spots

Existing (2008) and design-year (2035) project conditions were modeled to evaluate CO concentrations relative to the NAAQS and CAAQS (Table 4-16). Emissions of CO concentrations under design year conditions were modeled at the following six intersections: White Rock Road/Latrobe Road, White Rock Road/Off-Vehicle Road, Teichert (local road)/Grant Line Road, SR 99 northbound ramps/Grant Line Road, East Bidwell Road/Iron Point Road, and Scott Road/Easton Valley Parkway. These intersections were modeled because they were identified by the traffic engineers as having the greatest peak-hour traffic volumes and worst LOS/delay (Long pers. comm.). CO modeling under existing conditions was conducted at the intersection of East Bidwell Road and Iron Point Road only. This intersection was selected as the traffic data indicates that it is the only intersection that will experience higher delay and/or LOS with implementation of the project. Conditions at all other intersections will improve under the build condition.

Table 4-16 summarizes the results of the CO modeling and indicates that concentrations are not expected to contribute to any new localized violations of the 1- or 8-hour ambient standards. This impact is considered less than significant.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

Diesel Particulate Matter

DPM is the pollutant of primary concern with regard to cancer risks to sensitive receptors. DPM is emitted from diesel-powered construction equipment, as well as vehicles traveling on freeways and local roadways.

A number of site-specific factors are required to calculate DPM concentrations caused by construction activities that are beyond the scope of this program-level evaluation. For example, the schedule and location of operating equipment, as well as meteorological conditions, are necessary to accurately model pollutant dispersion and calculate relative concentrations downwind of the source of DPM. In addition, information on the location of specific receptors is required to perform a health risk assessment (HRA). Because a detailed construction schedule is currently unavailable, a reasonable quantitative analysis of health risks from construction is not possible. However, the state's Office of Environmental Health Hazard Assessment stresses that cancer health risks typically are associated with chronic exposures to DPM, and it recommends using a 70-year exposure period for the cancer risk analysis. Emissions for construction-related DPM will be temporary and cease once construction is complete. Moreover, they will be spread throughout the 35-mile project corridor during the 10-year construction period, rather than localized in a single area. It is unlikely that construction activities will result in elevated health risks. In addition, Mitigation Measures AQ-2 through AQ-4, as described above, will help to minimize concentrations of DPM at nearby sensitive receptors during construction. Therefore, this analysis focuses on potential long-term cancer risk to sensitive receptors adjacent to roadways within the air quality study area.

Health risks resulting from vehicle emissions in the air quality study area were evaluated using the CAL3HQCR dispersion model and guidance from the SMAQMD (Appendix B). Based on the screening criterion[5] recommended by the SMAQMD, a site-specific HRA was conducted for existing (2008) and design-year conditions (2035) on the following segments:

- Sunrise Boulevard from Zinfandel Road to US 50,
- US 50 from Watt Avenue to Hazel Avenue, and
- SR 99 from Calvine Road to Sheldon Road.

Table 4-17 summarizes the results of the HRA. Only the maximum recorded DPM concentration and associated cancer risk are presented. It is important to note that the cancer risks presented in Table 4-17 are based on projected roadway traffic volumes expected to occur in 2035, vehicle emission rates over an exposure frequency of 350 days per year, and an exposure duration of 70 years, consistent with SMAQMD protocol. They do not reflect assumed changes in roadway traffic volumes or vehicle emission rates. It is anticipated that traffic rates will increase slightly each year because of increases in regional population over time and that vehicle emission rates will decrease slightly each year because of continuing improvements in engine technology, increases in emission standards, and retirement of older, higher-emitting vehicles. Therefore, it is anticipated that the results

[5] This criterion screen roadways based the number of vehicles per hour and locations of sensitive receptors. A site-specific HRA is required for all segments with a predicted cancer risk in excess of 281 cases per million. The SMAQMD selected the evaluation criterion of 281 cases per million "as the level of increased individual cancer risk corresponding to a 70% reduction from the highest risk calculated at 50 feet from the edge of the nearest travel lane to the nearest sensitive receptor for the highest peak traffic volume reported by Caltrans for Sacramento County" (Sacramento Metropolitan Air Quality Management District 2010).

Table 4-16. Modeled CO Concentrations at Defined Receptor Locations for Exiting (2008) and Design-Year (2035) Conditions

		Existing (2008) Conditions[a]				Design Year (2035) Conditions									
		No Project		Proposed Project with High Access Roadway[b]		No Project		Proposed Project with Reduced Access Roadway		Proposed Project with Deer Creek Causeway Option 1		Proposed Project with Deer Creek Causeway Option 1		Proposed Project with High Access Roadway	
Intersection	Receptor ID	1-hour CO	8-hour CO	1-hour CO	8-hour CO	1-hour CO	8-hour CO	1-hour CO	8-hour CO	1-hour CO	8-hour CO	1-hour CO	8-hour CO	1-hour CO	8-hour CO
On Project Corridor															
White Rock Road and Latrobe Road	1	–	–	–	–	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4
	2	–	–	–	–	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	3	–	–	–	–	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4
	4	–	–	–	–	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
White Rock Road and Off-Vehicle Road	5	–	–	–	–	4.2	3.4	4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6
	6	–	–	–	–	4.2	3.4	4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6
	7	–	–	–	–	4.2	3.4	4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6
	8	–	–	–	–	4.2	3.4	4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6
Teicher and Grant Line Road	9	–	–	–	–	4.0	3.3	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	10	–	–	–	–	4.0	3.3	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	11	–	–	–	–	4.0	3.3	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	12	–	–	–	–	4.0	3.3	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
SR 99 Northbound and Grant Line Road	13	–	–	–	–	4.0	3.3	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4
	14	–	–	–	–	4.1	3.4	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	15	–	–	–	–	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4	4.1	3.4
	16	–	–	–	–	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
Non- Project Corridor Intersections															
East Bidwell Road and Iron Point Road	17	8.4	6.0	8.5	6.0	4.3	3.5	4.3	3.5	4.3	3.5	4.3	3.5	4.3	3.5
	18	8.7	6.1	8.8	6.2	4.4	3.6	4.2	3.4	4.4	3.6	4.4	3.6	4.4	3.6
	19	8.4	6.0	8.5	6.0	4.3	3.5	4.3	3.5	4.3	3.5	4.3	3.5	4.3	3.5
	20	8.8	6.2	8.9	6.3	4.4	3.6	4.5	3.6	4.5	3.6	4.4	3.6	4.5	3.6
Scott Road and Easton Valley Parkway	21					4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	22					4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4	4.2	3.4
	23					4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6
	24					4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6	4.4	3.6

Note: Please refer to Appendix B for modeling procedures.

[a] Due to limited traffic data, concentrations were only modeled at the intersection of East Bidwell Road and Iron Point Road. This intersection was selected as the traffic data indicates that it is the only intersection that will experience higher delay and/or LOS with implementation of the project.

[b] The traffic data required to conduct a CO analysis was only available for the no project alternative and the design option with the highest average daily traffic (ADT). Based on ADT provided under future conditions, this option was assumed to be the High Access Roadway.

presented in this analysis represent the upper end of potential health risks that may result from exposure of sensitive receptors to roadway exhaust.

Table 4-17. Maximum DPM Concentration and Cancer Risk under Design-Year Conditions (2035)

	Sunrise Blvd			US-50			SR-99		
Alternative	Peak VMT	PM Concen-tration	Cancer Risk[a]	Peak VMT	PM Concen-tration	Cancer Risk[a]	Peak VMT	PM Concen-tration	Cancer Risk[a]
Existing Conditions (2008)[b]									
No Project	8,420	1.32	420	16,600	2.71	863	10,300	2.02	643
Proposed Project with High Access Roadway[c]	8,420	1.32	420	16,528	2.69	857	10,300	2.02	643
Design Conditions (2035)[b]									
No Project	5,726	0.58	185	23,281	2.10	669	13,133	1.46	465
Proposed Project with Reduced Access Roadway	7,280	0.74	236	22,822	2.06	656	13,133	1.46	465
Proposed Project with Deer Creek Causeway Option 1	9,308	0.95	303	22,708	2.05	653	13,047	1.41	449
Proposed Project with Deer Creek Causeway Option 2	9,337	0.95	303	22,708	2.05	653	13,047	1.41	449
Proposed Project with High Access Roadway	7,473	0.76	242	22,822	2.06	656	13,133	1.46	465
Project Contribution (under existing conditions)[d]									
2008 Proposed Project with High Access Roadway	0	0.00	0	-72	-0.02	-6	0	0.00	0

Note: Please refer to Appendix B for modeling procedures.

[a] Maximum values recorded at receptors located 50 feet to the north of US 50 and 25 feet to the east of SR 99.

[b] Represents emissions associated with traffic generated by both the project option and development in the study area.

[c] Based on traffic data presented in Chapter 16, the High Access Roadway has the highest ADT volumes and therefore, the represents the greatest potential to caused increased cancer risk. DPM concentrations associated with all other project options would be less than those presented for the High Access Roadway.

[d] Represents emissions associated with just the project option, as calculated by the following equation: Proposed Project with Project Option minus No Project

Health risks from are typically evaluated at a project level, as well as at a cumulative level. The project-level analysis evaluates the health risks associated with exposure to emissions generated directly by a project, while the cumulative evaluation evaluates health risks associated with exposure to emissions generated directly by a project as well as those already present in the existing ambient environment over a given time period. However, for the purposes of the project-level analysis required by CEQA, the point of significance is based on the potential added cancer risk attributed to implementation of the project under existing conditions (i.e., existing plus project – existing no project).

Based on Table 4-17, the proposed project with the High Access Roadway would result in no impact or a slightly decreased cancer risk to receptors adjacent to Sunrise Boulevard, US 50 and SR 99, relative to the no project alternative. While no other design options were modeled, traffic volumes are expected to be highest under the proposed project with the High Access Roadway (Refer to Chapter 16). Thus the proposed project with the High Access Roadway represents the greatest potential for increased cancer risk, as DPM concentrations associated with all other project options would be less than those presented for the proposed project with the High Access Roadway. Because projected cancer risk is expected to decrease with the project option, this impact is considered less than significant.

Although this impact is considered less-than-significant, implementation of the exposure reduction strategies outlined in Mitigation Measure AQ-5 is recommended given the relative uncertainty associated with the modeling assumptions used to estimate DPM concentrations (see Appendix B). Implementation of this measure will help reduce any potential increases in cancer risk along the project corridor.

Mitigation Measure AQ-5: Implement Additional Exposure Reduction Strategies to Further Minimize Potential Health Risks

The JPA or local agency will implement strategies to reduce the potential for sensitive receptors along the project corridor to be exposed to DPM. Potential strategies include (but are not limited to) creating a buffer zone of at least 50 feet between the roadway and sensitive land uses (e.g., residences, parks, churches, and medical facilities), as well as planting additional vegetation along the project corridor (A laboratory study indicates that all forms of vegetation are effective in removing PM10, although the greatest removal rates are achieved with redwood and deodar cedar –[Sacramento Metropolitan Air Quality Management District 2010]). These strategies should be focused in areas where sensitive receptors are directly adjacent to the roadway. Selection of these species should be maximized to the extent feasible.

Naturally Occurring Asbestos

According to the California Geological Survey (CGS), only roadways constructed east of Folsom could potentially traverse areas with potential to contain NOA (California Geological Survey 2006). Given current development practices and the age of the roadway network[6], it is unlikely that construction activities would result in airborne impacts of asbestos. However, this impact is considered potentially significant. Implementation of Mitigation Measure AQ-6 is required to assess the potential for NOA in the project area and ensure that appropriate actions are taken if NOA is found.

Mitigation Measure AQ-6: Conduct a Geological Investigation for Naturally Occurring Asbestos and Implement an Asbestos Dust Mitigation Plan if Naturally Occurring Asbestos Is Found in the Project Area

The JPA or local agency will conduct a site-specific geological investigation for all construction areas with known potential to contain NOA. According to the CGS, this includes all portions of the construction area east of Folsom (California Geological Survey 2006). If NOA is identified in the project area, the JPA or local agency will submit an asbestos dust mitigation plan to the SMAQMD and/or EDCAPCD pursuant to the State of California's Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations*.* This plan shall be prepared prior to ground breaking by the JPA, local agency, or appointed consultant.

[6] Roadways that were constructed prior to current regulations that restrict the use of asbestos containing construction materials have a greater potential of containing the compound.

Impact AQ-4: Create Objectionable Odors Affecting a Substantial Number of People

The generation and severity of odors depend on a number of factors, including the nature, frequency, and intensity of the source; wind direction; and location of the receptor(s). Odors rarely cause physical harm, but can cause discomfort, leading to complaints to regulatory agencies. Typical facilities known to produce odors include landfills, wastewater treatment plants, manufacturing plants, and certain agricultural activities. The proposed project and optional project components would not result in the addition of a major odor-producing facility.

Diesel emissions from construction equipment and volatile organic compounds (VOCs) from paving activities may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Therefore, it is not anticipated that construction or operation of the proposed project options would create objectionable odors. This impact is considered less than significant.

4.3.4 Impacts of the Off-Corridor Multi-Use Path Alternative

Impact AQ-1: Conflict with or Obstruct Implementation of an Applicable Air Quality Management Plan

Implementation of the Off-Corridor Multi-Use Path Option would not increase use of motor vehicles or contribute to population and/.or employment growth. It would therefore not conflict with the goals of applicable air quality management plans. There would be no impact.

Impact AQ-2: Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

As shown in Tables 4-10 and 4-11, the Off-Corridor Multi-Use Path Option would result in unmitigated construction emissions that exceed SMAQMD's thresholds. The impact would be significant. Implementation of Mitigation Measures AQ-1 through AQ-4 are required to reduce emissions to less-than-significant.

Operational emissions associated with the Off-Corridor Multi-Use Path Option were not estimated because the traffic analysis (Chapter 16, "Traffic") found that this option would have no discernable impacts on the transportation network and did not identify any differences in the operational data. Implementation of this optional project component would not increase use of motor vehicles. Therefore, there is no impact.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

Emissions of construction-related DPM will be temporary and cease once construction is complete. It is unlikely that construction activities will result in elevated health risks for sensitive receptors along the off-corridor multi-use path. Operational emissions associated with the Off-Corridor Multi-Use Path Option were not estimated because the traffic analysis (Chapter 16) found that this option would have no discernable impacts on the transportation network. Implementation of this optional project component would not increase use of motor vehicles. Therefore, there would be no impact.

Impact AQ-4: Create Objectionable Odors Affecting a Substantial Number of People

Diesel emissions from construction equipment and VOCs from paving activities may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Therefore, it is not anticipated that construction or operation of the Off-Corridor Multi-Use Path Option would create objectionable odors. This impact is considered less than significant.

4.3.5 Impacts of the Project Options

4.3.5.1 Kammerer Road Bypass Option

Impact AQ-1: Conflict with or Obstruct Implementation of an Applicable Air Quality Management Plan

An extension of Kammerer Road from Bruceville Road to I-5 has been identified in local and regional planning documents by Sacramento County, the City of Elk Grove, and SACOG. The Kammerer Road Bypass Option was developed by Sacramento County and the City of Elk Grove to avoid impacts on properties along the project alignment. Moreover, this optional project component is not likely to result in population or employment growth that exceeds growth estimates included in the SMAQMD air quality plans or generate emissions that exceed the emissions budget identified in the air quality plans. This impact is considered less than significant.

Impact AQ-2: Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

As shown in Tables 4-10 and 4-11, the Kammerer Road Bypass Option would result in unmitigated construction emissions that exceed SMAQMD's thresholds. The impact would be significant. Implementation of Mitigation Measures AQ-1 through AQ-4 would reduce the impact to a less-than-significant level.

Operational emissions associated with the Kammerer Road Bypass were not estimated because the traffic analysis (Chapter 16) found that this option would have no discernable impacts on the transportation network compared to the Proposed Project. Because the traffic analysis did not identify any differences in the operational data considered for the proposed project along this segment, a quantitative assessment of emissions could not be performed. As set forth in Section 4.3.3 above, this impact is considered significant. As described above, there is no feasible mitigation to reduce this impact to a less-than-significant level.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

Emissions of construction-related DPM will be temporary and cease once construction is complete. It is unlikely that construction activities will result in elevated health risks for sensitive receptors along Kammerer Road.

Operational emissions associated with the Kammerer Road Bypass Option were not estimated because the traffic analysis (Chapter 16) found that this option would have no discernable impacts on the transportation network. The analysis did not identify any differences in the operational data considered for the proposed project along this segment. Because traffic conditions under the proposed project with the High Access Roadway, which represents the design option with the greatest potential for increased concern risk, would not result in significant health risks, this impact is likewise considered less-than-significant. Implementation of Mitigation Measure AQ-5, as described above, is recommended to reduce any potential increases in cancer risk along other project corridor segments.

Impact AQ-4: Create Objectionable Odors Affecting a Substantial Number of People

Diesel emissions from construction equipment and VOCs from paving activities may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Therefore, it is not anticipated that construction or operation of the Kammerer Road Bypass Option would create objectionable odors. This impact is considered less than significant.

4.3.5.2 Deer Creek Causeway Options

Impact AQ-1: Conflict with or Obstruct Implementation of an Applicable Air Quality Management Plan

Implementation of Deer Creek Causeway Options 1 and 2 is not consistent with the Elk Grove General Plan, which calls for widening Grant Line Road through Sheldon when needed to accommodate future increases in traffic. However, these optional project components are not likely to result in population or employment growth that exceeds growth estimates included in the SMAQMD air quality plans or generate emissions that exceed the emissions budget identified in the air quality plans. This impact is considered less than significant.

Impact AQ-2: Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

Deer Creek Causeway Options 1 and 2 would create a new road alignment requiring grubbing/land clearing, grading/excavation, drainage/utilities/subgrade construction, paving activities, and construction worker commuting trips. As shown in Table 4-10, construction emissions would exceed SMAQMD thresholds. The impact would be significant. As described above, implementation of Mitigation Measures AQ-1 through AQ-4 would reduce the impact to a less-than-significant level.

Deer Creek Causeway Options 1 and 2 would create a new road alignment, adding additional traffic lanes to the project corridor. As shown in Table 4-16, CO concentrations are not expected to contribute to any new localized violations of the 1- or 8-hour ambient standards. However, as shown in Table 4-14, these optional project components would result in a net increase in all criteria pollutants within the SMAQMD and exceed the district's thresholds. The impact is considered significant. As described above, there is no feasible mitigation to reduce this impact to a less-than-significant level.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

As shown in Table 4-17, implementation of the proposed project with the High Access Roadway would result in no impact or a slightly decreased cancer risk to receptors adjacent to Sunrise Boulevard, US 50 and SR 99, relative to the no project alternative. Because the High Access Roadway represents the design option with highest ADT, cancer risks under the Deer Creek Causeway Options 1 and 2 would be less than those modeled for the High Access Roadway, as the Deer Creek Causeway Options 1 and 2 have less traffic than the High Access Roadway. However, implementation of exposure reduction strategies outlined in Mitigation Measure AQ-5 is recommended to reduce any potential increase in cancer risk along other project corridor segments. NOA is not known to occur in the location of these optional project components. This impact is considered less than significant.

Impact AQ-4: Create Objectionable Odors Affecting a Substantial Number of People

Diesel emissions from construction equipment and VOCs from paving activities may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Therefore, it is not anticipated that construction or operation of Deer Creek Causeway Options 1 and 2 would create objectionable odors. This impact is considered less than significant.

4.3.5.3 Reduced Access Roadway Option

Impact AQ-1: Conflict with or Obstruct Implementation of an Applicable Air Quality Management Plan

Implementation of the Reduced Access Roadway Option is not consistent with the Elk Grove General Plan, which calls for widening Grant Line Road through Sheldon when needed to accommodate future increases in traffic. However, this option is not likely to result in population or employment growth that exceed growth estimates included in the SMAQMD air quality plans or generate emissions that exceed the emissions budget identified in the air quality plans. This impact is considered less than significant.

Impact AQ-2: Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

The Reduced Access Roadway Option could require grubbing/land clearing, grading/excavation, drainage/utilities/subgrade construction, paving activities, and construction worker commuting trips. As shown in Table 4-10, construction emissions would exceed SMAQMD thresholds. The impact would be significant. As described above, implementation of Mitigation Measures AQ-1 through AQ-4 would reduce the impact to a less -than significant level.

The Reduced Access Roadway Option could add to local circulation. As shown in Table 4-16, CO concentrations are not expected to contribute to any new localized violations of the 1- or 8-hour ambient standards. However, as shown in Table 4-14, this optional project component would result in a net increase in all criteria pollutants within the SMAQMD and exceed the district's thresholds. The impact would be considered significant. As described above, there is no feasible mitigation to reduce this impact to a less-than-significant level.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

As shown in Table 4-17, the High Access Roadway Option would result in no impact or a slightly decreased cancer risk to receptors adjacent to Sunrise Boulevard, US 50 and SR 99, relative to the no project alternative. However, implementation of exposure reduction strategies outlined in Mitigation Measure AQ-5 is recommended to reduce any potential increase in cancer risk along the other project corridor segments. NOA is not known to occur in the area. This impact is considered less than significant.

Impact AQ-4: Create Objectionable Odors Affecting a Substantial Number of People

Diesel emissions from construction equipment and VOCs from paving activities may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Therefore, it is not anticipated that construction or operation of the Reduced Access Roadway Option would create objectionable odors. This impact is considered less than significant.

4.3.5.4 High Access Roadway Option

Impact AQ-1: Conflict with or Obstruct Implementation of an Applicable Air Quality Management Plan

Implementation of the High Access Roadway Option is consistent with the Elk Grove General Plan, which calls for widening Grant Line Road through Sheldon when needed to accommodate future increases in traffic. There would be no impact.

Impact AQ-2: Violate Any Air Quality Standard or Contribute Substantially to an Existing or Projected Air Quality Violation

The High Access Roadway Option could require grubbing/land clearing, grading/excavation, drainage/utilities/subgrade construction, paving activities, and construction worker commuting trips. As shown in Table 4-10, construction emissions would exceed SMAQMD thresholds. The impact would be significant. As described above, Mitigation Measures AQ-1 through AQ-4 would reduce the impact to a less-than-significant level.

The High Access Roadway Option could add to local circulation. As shown in Table 4-16, CO concentrations are not expected to contribute to any new localized violations of the 1- or 8-hour ambient standards. However, as shown in Table 4-14, this option would result in a net increase in all criteria pollutants within the SMAQMD and exceed the district's thresholds. The impact would be considered significant. As described above, there is no feasible mitigation to reduce this impact to a less-than-significant level.

Impact AQ-3: Expose Sensitive Receptors to Substantial Pollutant Concentrations

As shown in Table 4-17, implementation of the proposed project with the High Access Roadway Option would result in no impact or a slightly decreased cancer risk to receptors adjacent to Sunrise Boulevard, US 50 and SR 99, relative to the no project alternative. Because the High Access Roadway represents the design option with highest ADT, cancer risks under the Deer Creek Causeway Options 1 and 2 would be less than those modeled for the High Access Roadway, as the Deer Creek Causeway Options 1 and 2 have less traffic than the High Access Roadway. However, implementation of exposure reduction strategies outlined in Mitigation Measure AQ-5 is recommended to reduce any potential increase in cancer risk along other project corridor segments. NOA is not known to occur in the area. This impact is considered less than significant.

Impact AQ-4: Create Objectionable Odors Affecting a Substantial Number of People

Diesel emissions from construction equipment and VOCs from paving activities may create odors during construction. These odors would be temporary and localized, and they would cease once construction activities have been completed. Therefore, it is not anticipated that construction operation of the High Access Roadway Option would create objectionable odors. This impact is considered less than significant.