Addendum to the Fresno COG 2011 RTP Final SEIR

- Chapter 3 of the Final SEIR: Add the following change to Chapter 3, Changes, Additions and Corrections to the Draft SEIR:

  - Chapter 3, replace Section 3.3, with Attachment A.
  - Chapter 3, replace Section 3.5, with Attachment B.
  - Chapter 3, replace Section 3.10, with Attachment C.
  - Revise all table numbers in Chapter 3, Sections 3.6 through 3.16 to begin with Table 3-37.

ATTACHMENT A

3.3 AIR QUALITY

Fresno County is located in one of the most polluted air basins in the country – the San Joaquin Valley Air Basin. The surrounding topography includes foothills and mountains to the east and west. These mountain ranges direct air circulation and dispersion patterns. Temperature inversions can trap air within the Valley, thereby preventing the vertical dispersal of air pollutants. In addition to topographic conditions, the local climate can also contribute to air quality problems. Climate in Fresno County is classified as Mediterranean, with moist cool winters and dry warm summers.

Ozone, classified as a "regional" pollutant, often afflicts areas downwind of the original source of precursor emissions. Ozone can be easily transported by winds from a source area. Peak ozone levels tend to be higher in the southern portion of the Valley, as the prevailing summer winds sweep precursors downwind of northern source areas before concentrations peak. The separate designations reflect the fact that ozone precursor transport depends on daily meteorological conditions.

Other primary pollutants, carbon monoxide (CO), for example, may form high concentrations when wind speed is low. During the winter, Fresno County experiences cold temperatures and calm conditions that increase the likelihood of a climate conducive to high CO concentrations.

Surface radiant cooling can also cause temperature inversions. On clear winter nights, the ground loses heat at a rapid rate, causing air in contact with it to cool. Once formed, radiation inversions are similar to subsidence inversions with respect to their effects on pollutant dilution. As a result, conditions in Fresno County are conducive to the containment of air pollutants.

Regulatory

Air quality in the County is addressed through the efforts of various federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies primarily responsible for improving the air quality within Fresno County are discussed below, along with their individual responsibilities.

Federal Regulations

- National Environmental Policy Act (NEPA)

  The National Environmental Policy Act (NEPA) provides general information on the effects of federally funded projects. The act was implemented by regulations included in the Code of Federal Regulations (40CFR6). The code requires careful consideration concerning environmental impacts of federal actions or plans, including projects that receive federal funds. The regulations address impacts on land uses and conflicts with state, regional, or local plans and policies, among others. They also require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions and to restore and enhance environmental quality as much as possible.

- Transportation Conformity Analysis

Transportation conformity requirements were added to the FCAA in the 1990 amendments, and the EPA adopted implementing regulations in 1997. See §176 of the FCAA (42 U.S.C. §7506) and 40 CFR Part 93, Subpart A. Transportation conformity serves much the same purpose as general conformity: it ensures that transportation plans, transportation improvement programs, and projects that are developed, funded, or approved by the United States Department of Transportation or that are recipients of funds under the Federal Transit Act or from the Federal Highway Administration (FHWA), conform to the State Implementation Plan (SIP) as approved or promulgated by EPA.

Currently, transportation conformity applies in nonattainment areas and maintenance areas. Under transportation conformity, a determination of conformity with the applicable SIP must be made by the agency responsible for the project, such as the Metropolitan Planning Organization (MPO), the Council of Governments (COG), or a federal agency. The agency making the determination is also responsible for all the requirements relating to public participation. Generally, a project will be considered in conformance if it is in the transportation improvement plan and the transportation improvement plan is incorporated in the SIP. If an action is covered under transportation conformity, it does not need to be separately evaluated under general conformity.

- Transportation Control Measures

One particular aspect of the SIP development process is the consideration of potential control measures as a part of making progress towards clean air goals. While most SIP control measures are aimed at reducing emissions from stationary sources, some are typically also created to address mobile or transportation sources. These are known as transportation control measures (TCMs). TCM strategies are designed to reduce vehicle miles traveled and trips, or vehicle idling and associated air pollution. These goals are achieved by developing attractive and convenient alternatives to single-occupant vehicle use. Examples of TCMs include ridesharing programs, transportation infrastructure improvements such as adding bicycle and carpool lanes, and expansion of public transit.

Federal Agencies

- U.S. Environmental Protection Agency (EPA)

The Federal Clean Air Bill, first adopted in 1967 and periodically amended since then, established federal ambient air quality standards. A 1987 amendment to the Bill set a deadline for the attainment of these standards. That deadline has since passed. The other Federal Clean Air Bill Amendments, passed in 1990, share responsibility with the state in reducing emissions from mobile sources. The U.S. Environmental Protection Agency (U.S. EPA) is responsible for enforcing the 1990 amendments.

The Federal Clean Air Act (FCAA) and the national ambient air quality standards identify levels of air quality for six “criteria” pollutants, which are considered the maximum levels of ambient air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The six criteria pollutants include ozone, CO, nitrogen dioxide, sulfur dioxide, particulate matter 10 microns in size and smaller (PM_{10}), and lead.

The U.S. EPA requires each state to prepare and submit a State Implementation Plan (SIP) that describes how the state will achieve the federal standards by the specified dates, depending on the severity of the air quality within the state or basin. Based on the provisions contained in the 1990 amendment, EPA designated the entire

San Joaquin Valley as nonattainment for two pollutants: ozone and particle matter less than 10 microns in size or PM_{10}.

In 2004, the EPA reclassified the San Joaquin Valley ozone nonattainment area from its previous severe status to "extreme" at the request of the SJVAPCD Board. Fresno County is considered to be in non-attainment of ozone and $PM_{2.5}$ standards.

State Regulations

- CARB Mobile-Source Regulation

The State of California is responsible for controlling emissions from the operation of motor vehicles in the state. Rather than mandating the use of specific technology or the reliance on a specific fuel, the CARB's motor vehicle standards specify the allowable grams of pollution per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved. Towards this end, the CARB has adopted regulations, which required auto manufacturers to phase in less polluting vehicles.

- California Clean Air Act

The California Clean Air Act (CCAA) was first signed into law in 1988. The CCAA provides a comprehensive framework for air quality planning and regulation, and spells out, in statute, the state's air quality goals, planning and regulatory strategies, and performance. The CCAA establishes more stringent ambient air quality standards than those included in the FCAA. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the California Health and Safety Code (CH&SC) [§39606(b)], which are similar to the federal standards. The San Joaquin Valley Air Pollution Control District is one of 35 air quality management districts that have prepared air quality management plans to accomplish a five percent annual reduction in emissions documenting progress toward the state ambient air quality standards.

- Tanner Air Toxics Act

California regulates TACs primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the CARB list of TACs. Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The AB 2588 requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, CARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus

fleet rule. Upcoming milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

- California Environmental Quality Act (CEQA)

  CEQA defines a significant impact on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. Land use is a required impact assessment category under CEQA. CEQA documents generally evaluate land use in terms of compatibility with the existing land uses and consistency with local general plans and other local land use controls (zoning, specific plans, etc).

State Agencies

- California Air Resources Board (CARB)

  In 1988, the State of California passed the California Clean Air Act (CCAA, State 1988 Statutes, Chapter 1568) that established more stringent state ambient air quality standards, and set forth a program for their achievement. State air basins are established by the California Air Resources Board (CARB). CARB implements state ambient air quality standards, as required in the State CCAA, and cooperate with the federal government in implementing pertinent sections of the federal Clean Air Bill, Amendments. Further, CARB has responsibility for controlling stationary and mobile source air pollutant emissions throughout the state.

  Fresno County is in the CARB-designated, SJVAB. A map of the SJVAB is provided in Figure 3-3. In addition to Fresno County, the SJVAB includes, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare Counties.

  Applicable federal and state standards are provided in Table 3-2.

Regional Agencies

- San Joaquin Valley Air Pollution Control District (SJVAPCD)

  The District is the agency responsible for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Fresno County and throughout the SJVAB. The District also has responsibility for monitoring air quality and setting and enforcing limits for source emissions. CARB is the agency with the legal responsibility for regulating mobile source emissions. The District is precluded from such activities under state law.

  The District was formed in mid-1991 and prepared and adopted the San Joaquin Valley Air Quality Attainment Plan (AQAP), dated January 30, 1992, in response to the requirements of the State CCAA. The CCAA requires each non-attainment district to reduce pertinent air contaminants by at least five percent (5%) per year until new, more stringent, 1988 state air quality standards are met.

FIGURE 3-2
Fresno COG 2011 RTP Draft SEIR
California Air Basins

TABLE 3-2

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		Federal Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.075 ppm (147 µg/m^3)		
Respirable Particulate Matter (PM10)	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)	24 Hour	No Separate State Standard		35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	15.0 µg/m^3		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m^3)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m^3)		35 ppm (40 mg/m^3)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	—
Nitrogen Dioxide (NO_2)[8]	Annual Arithmetic Mean	0.030 ppm (57 µg/m3)	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m^3)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.18 ppm (339 µg/m^3)		0.100 ppm	0.053 ppm (100 µg/m^3)	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Ultraviolet Fluorescence	0.030 ppm (80 µg/m^3)	—	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (365 µg/m^3)	—	
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	1 Hour	0.25 ppm (655 µg/m^3)		—	—	—
Lead[9]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	—
	Calendar Quarter	—		1.5 µg/m^3	Same as Primary Standard	High Volume Sampler and Atomic Absorption
	Rolling 3-Month Average[10]	—		0.15 µg/m^3		
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[9]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

For more information please call ARB-PIO at (916) 322-2990 California Air Resources Board (01/27/10)

**This concentration was approved by the Air Resources Board on April 28, 2005 and is expected to become effective in early 2006.*

Footnotes:

1. *California standards for ozone, carbon monoxide (except Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, suspended particulate matter—PM10, PM2.5, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.*
2. *National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest eight hour concentration in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m3 is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact U.S. EPA for further clarification and current federal policies.*
3. *Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.*
4. *Any equivalent procedure which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.*
5. *National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.*
6. *National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.*
7. *Reference method as described by the EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the EPA.*
8. *To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area must not exceed 0.100 ppm (effective January 22, 2010).*
9. *The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.*
10. *National lead standard, rolling 3-month average: final rule signed October 15, 2008*

Activities of the SJVAPCD include the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, issuance of permits for stationary sources of air pollution, inspection of stationary sources of air pollution and response to citizen complaints, monitoring of ambient air quality and meteorological conditions, and implementation of programs and regulations required by the FCAA and CCAA.

The SJVAPCD has prepared the *2007 Ozone Plan* to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone. The *2007 Ozone Plan* provides a comprehensive list of regulatory and incentive-based measures to reduce emissions of ozone and particulate matter precursors throughout the SJVAB. The 2007 Ozone Plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution. The *2007 Ozone Plan* calls for a 75-percent reduction in ozone-forming oxides of nitrogen emissions.

The SJVAPCD has also prepared the *2007 PM10 Maintenance Plan and Request for Redesignation* (2007 PM10 Plan). On April 24, 2006, the SJVAPCD submitted a Request for Determination of PM10 Attainment for the Basin to CARB. CARB concurred with the request and submitted the request to the EPA on May 8, 2006. On October 30, 2006, the EPA issued a Final Rule determining that the Basin had attained the NAAQS for

PM10. However, the EPA noted that the Final Rule did not constitute a redesignation to attainment until all of the FCAA requirements under Section 107(d)(3) were met.

The SJVAPCD has prepared the *2008 PM.2.5 Plan* to achieve Federal and State standards for improved air quality in the San Joaquin Valley Air Basin. The *2008 PM.2.5 Plan* provides a comprehensive list of regulatory and incentive based measures to reduce PM2.5.

In addition to the *2007 Ozone Plan, the 2008 PM2.5 Plan,* and the *2007 PM10 Plan*, the SJVAPCD prepared the *Guide for Assessing and Mitigation Air Quality Impacts* (GAMAQI). The GAMAQI is an advisory document that provides Lead Agencies, consultants, and project applicants with analysis guidance and uniform procedures for addressing air quality impacts in environmental documents. Local jurisdictions are not required to utilize the methodology outlined therein. This document describes the criteria that SJVAPCD uses when reviewing and commenting on the adequacy of environmental documents. It recommends thresholds for determining whether or not projects would have significant adverse environmental impacts, identifies methodologies for predicting project emissions and impacts, and identifies measures that can be used to avoid or reduce air quality impacts. An update of the GAMAQI was approved on January 10, 2002, and is used as a guidance document for this analysis.

The SJVAPCD 2007 Ozone, 2007 PM_{10}, 2008 PM2.5 as well as the 2004 Revision to the California State Implementation Plan contain statewide technology controls mandated by the California Air Resources Board (ARB). A summary of the ARB mandated control measures applicable to the 2011 RTP can be found in the Draft Fresno COG 2011 Conformity Analysis for the 2011 Federal Transportation Improvement Program and the 2011 Regional Transportation Plan (Conformity Analysis). The Draft Conformity Analysis can be found at the following link:

http://www.fresnocog.org/files/Air%20Quality/Conformity/Fresno%20COG%202011%20Draft%20Conformity%20Analysis%204-28-10.pdf

The SJVAPCD Plans identified above represent that SJVAPCD's plan to achieve both state and federal air quality standards. The regulations and incentives contained in these documents must be legally enforceable and permanent. These plans break emissions reductions and compliance into different emissions source categories. For this EIR only on-road mobile sources are considered as 2011 RTP does not impact the implementation of any SJVAPCD regulations or incentives on other emissions source categories.

Each of the SJVAPCD plans (2007 Ozone Plan, 2008 $PM_{2.5}$ Plan, and 2007 PM10 Maintenance Plan, which relies on the 2003 PM_{10} Plan for emissions reductions measures) identifies a "budget" for measuring progress toward achieving attainment of the national air quality standard. A "budget" is, in effect, an emissions "threshold" or "not to exceed value" for specific years in which progress toward attainment of the standard must be measured. These specific years can also be described as "budget years" and are established to ensure achievement of the "budget" to demonstrate continued progress toward attainment of the national air quality standard. The term "base year" also reflects a "threshold" or "not to exceed" value against which future emissions from the 2011 RTP are measured.

The United States Environmental Protection Agency defines specific years in which attainment of the federal standards must be reached, and therefore each of these SJVAPCD plans for which the San Joaquin Valley Air Basin is nonattainment contains different "budget years" in which progress must be made toward achievement of the federal standards. These years are documented below. Again the emissions budgets in Tables 3-3 through 3-6 below reflect "thresholds" or "not to exceed" values in the "budget years" for the identified pollutant in order to achieve attainment.

TABLE 3-3
On-Road Motor Vehicle CO Emissions Budgets
(Winter tons/day)

County	2018 Emissions (Winter Tons/Day)
Fresno	240

Source: San Joaquin Valley Air Pollution Control District, 2007

TABLE 3-4
On-Road Motor Vehicle Budgets from the 2007 Ozone Plan
(Summer tons/day)

County	2011		2014		2017	
	ROG	NOx	ROG	NOx	ROG	NOx
Fresno	15.5	47.9	12.9	37.2	11.1	29.1

Source: San Joaquin Valley Air Pollution Control District, "2007 Ozone Plan", 2007

TABLE 3-5
On-Road Motor Vehicle PM-10 Emissions Budgets
(Tons per average annual day)

County	2020	
	PM-10	NOx
Fresno	16.1	23.2

Source: San Joaquin Valley Air Pollution Control District, "2007 PM10 Maintenance Plan", 2007

TABLE 3-6
On-Road Motor Vehicle PM2.5 Emissions Budgets
(Tons per average annual day)

County	2012		2014	
	PM2.5	NOx	PM2.5	NOx
Fresno	1.9	44.2	1.1	26.0

Source: San Joaquin Valley Air Pollution Control District, "2008 PM.2.5 Plan", 2008

The SJVAPCD has adopted numerous rules and regulations to implement its air quality plans. Following, are significant rules that will apply to the proposed project.

- Regulation VIII – Fugitive PM10 Prohibitions

  Regulation VIII is comprised of District Rules 8011 through 8081, which are designed to reduce PM_{10} emissions (predominantly dust/dirt) generated by human activity, including construction and demolition activities, road construction, bulk materials storage, paved and unpaved roads, carryout and track out, landfill operations, etc.

- Rule 8021 – Construction, Demolition, Excavation, and Other Earthmoving Activities

  District Rule 8021 requires owners or operators of construction projects to submit a Dust Control Plan to the District if at any time the project involves non-residential developments of five or more acres of disturbed surface area or moving, depositing, or relocating of more than 2,500 cubic yards per day of bulk materials on at least three days of the project. The proposed project will meet these criteria and will be required to submit a Dust Control Plan to the District in order to comply with this rule.

- Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt, Paving and Maintenance Operations

  If asphalt paving will be used, then paving operations of the proposed project will be subject to Rule 4641. This rule applies to the manufacture and use of cutback asphalt, slow cure asphalt and emulsified asphalt for paving and maintenance operations.

San Joaquin Valley Air Basin Monitoring

The SJVAB consists of eight counties, from Fresno County in the north to Kern County in the south. SJVAPCD and CARB maintain numerous air quality monitoring sites throughout each County in the Air Basin to measure ozone, PM2.5, and PM10. It is important to note that the federal ozone 1-hour standard was revoked by the EPA and is no longer applicable for federal standards. Data obtained from the monitoring sites throughout the SJVAB between 2006 and 2009 is summarized in Tables 3-7 through 3-9.

TABLE 3-7
SJVAB Ambient Air Quality Monitoring Data Summary - Ozone 2006-2009

Year	Days > Standard				1-Hour Observations			8-Hour Averages				Year	
	State		National			State	Nat'l	State		National		Coverage	
	1-Hr	8-Hr	1-Hr	'08 8-Hr	Max.	D.V.[1]	D.V.[2]	Max.	D.V.[1]	Max.	'08 D.V.[2]	Min	Max
2009	82	122	*4*	98	0.135	0.14	*0.14*	0.11	0.124	0.11	0.105	0	100
2008	95	150	*19*	127	0.157	0.15	*0.136*	0.132	0.124	0.132	0.108	65	100
2007	69	138	*3*	110	0.138	0.14	*0.135*	0.11	0.12	0.11	0.107	85	100
2006	90	141	*18*	120	0.141	0.14	*0.135*	0.122	0.117	0.121	0.11	58	100

Notes: All concentrations expressed in parts per million. The national 1-hour ozone standard was revoked in June 2005 and is no longer in effect. Statistics related to the revoked standard are shown in italics. D.V. [1] = State Designation Value. D.V. [2]= National Design Value.
Sources: California Air Resources Board (ADAM) Air Pollution Summaries, 2006, 2007, and 2008.

TABLE 3-8
SJVAB Ambient Air Quality Monitoring Data Summary - PM 2.5 2006-2009

Year	Est. Days > Nat'l '06 Std.	Annual Average		Nat'l Ann. Std. D.V.[1]	State Annual D.V.[2]	Nat'l '06 Std. 98th Percentile	Nat'l '06 24-Hr Std. D.V.[1]	High 24-Hour Average		Year Coverage	
		Nat'l	State					Nat'l	State	Min.	Max.
2009	42.9	19.3	21.2	21.5	25	65.4	70	82.3	85.5	37	100
2008	66.7	23.5	21.2	21.5	25	72.3	70	100.3	118.8	11	100
2007	65.6	22	25.2	20.3	25	73	69	103.8	154	79	98
2006	38.7	19.3	21.6	18.9	22	64.7	64	87	88.1	83	100

Notes: All concentrations expressed in parts per million. State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria. D.V. [1] = State Designation Value. D.V. [2]= National Design Value

Sources: California Air Resources Board (ADAM) Air Pollution Summaries, 2006, 2007, and 2008.

TABLE 3-9
SJVAB Ambient Air Quality Monitoring Data Summary - PM 10 2006-2009

Year	Est. Days > Std.		Annual Average		3-Year Average		High 24-Hr Average		Year
	Nat'l	State	Nat'l	State	Nat'l	State	Nat'l	State	Coverage
2009	1.9	123.4	*	46.5	*	56	423.8	139.5	100
2008	4.8	182.2	59.7	55.9	57	56	358.8	353.5	100
2007	1.4	145.1	54.8	48.5	51	56	172	135	100
2006	4.2	166.8	55.4	56.4	47	56	303.9	255	100

Notes: The national annual average PM10 standard was revoked in December 2006 and is no longer in effect. An exceedance is not necessarily a violation. Statistics may include data that are related to an exceptional event. State and national statistics may differ for the following reasons: State statistics are based on California approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. National statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Sources: California Air Resources Board (ADAM) Air Pollution Summaries, 2006, 2007, and 2008.

Tables 3-10 and 3-11 reflect the ambient air quality classifications for monitoring sites in Fresno County. Table 3-12 identifies the District's attainment status. As indicated, the SJVAB is nonattainment for Ozone (1 hour and 8 hour) and PM (2.5 microns in size). In accordance with the federal Clean Air Act, EPA uses the design value at the time of standard promulgation to assign nonattainment areas to one of several classes that reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. The Federal Clean Air Act contains provisions for changing the classifications using factors such as clean air progress rates and requests from States to move areas to a higher classification. On April 16, 2004 EPA issued a final rule classifying the SJVAB as extreme nonattainment for Ozone, effective May 17, 2004 (69 FR 20550). The (federal) 1-hour ozone standard was revoked on June 6, 2005. However, many of the requirements in the 1-hour attainment plan (SIP) continue to apply to the SJVAB. The current ozone plan is the (federal) 8-hour ozone plan adopted in 2007. The

SJVAB was reclassified from a "serious" nonattainment area for the 8-hour ozone standard to "extreme' effective June 4, 2010.

TABLE 3-10
Maximum Pollutant Levels at Fresno's First Street Monitoring Station

Pollutant	Time Averaging	2006 Maximums	2007 Maximums	2008 Maximums	Standards National	Standards State
Ozone (O_3)	1 hour	0.138 ppm	0.119 ppm	0.157 ppm	-	0.09 ppm
Ozone (O_3)	8 hour	0.113 ppm	0.101 ppm	0.132 ppm	0.08 ppm	-
Carbon Monoxide (CO)	8 hour	3.2 ppm	2.6 ppm	2.34 ppm	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO_2)	1 hour	0.076 ppm	0.086 ppm	0.070 ppm	-	.025 ppm
Nitrogen Dioxide (NO_2)	Annual Average	0.017 ppm	0.017 ppm	0.016 ppm	0.053 ppm	-
Particulates (PM_{10})	24 hour	117 mg/m^3	107 mg/m^3	77.7 mg/m^3	150 mg/m^3	50 mg/m^3
Particulates (PM_{10})	Federal Annual Arithmetic Mean	37.7 mg/m^3	32.0 mg/m^3	34.4 mg/m^3	50 mg/m^3	20 mg/m^3
Particulates ($PM_{2.5}$)	24 hour	71.0 mg/m^3	103.8 mg/m^3	79.5 mg/m^3	65 mg/m^3	-
Particulates ($PM_{2.5}$)	Federal Annual Arithmetic Mean	16.7 mg/m^3	18.8 mg/m^3	17.3 mg/m^3	15 mg/m^3	12 mg/m^3

Source: CARB Website, 2010

TABLE 3-11
Maximum Pollutant Levels at Parlier's Monitoring Station

Pollutant	Time Averaging	2006 Maximums	2007 Maximums	2008 Maximums	Standards National	Standards State
Ozone (O_3)	1 hour	0.131 ppm	0.113 ppm	0.137 ppm	-	0.09 ppm
Ozone (O_3)	8 hour	0.107 ppm	0.096 ppm	0.116 ppm	0.08 ppm	-
Carbon Monoxide (CO)[a]	8 hour	3.2 ppm	2.6 ppm	2.34 ppm	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO_2)	1 hour	0.062 ppm	0.055 ppm	0.049 ppm	-	.025 ppm
Nitrogen Dioxide (NO_2)	Annual Average	0.011 ppm	0.011 ppm	0.009 ppm	0.053 ppm	-
Particulates (PM_{10})[a]	24 hour	117 mg/m^3	107 mg/m^3	77.7 mg/m^3	150 mg/m^3	50 mg/m^3
Particulates (PM_{10})[a]	Federal Annual Arithmetic Mean	37.7 mg/m^3	32.0 mg/m^3	34.4 mg/m^3	50 mg/m^3	20 mg/m^3
Particulates ($PM_{2.5}$)[a]	24 hour	71.0 mg/m^3	103.8 mg/m^3	79.5 mg/m^3	65 mg/m^3	-
Particulates ($PM_{2.5}$)[a]	Federal Annual Arithmetic Mean	16.7 mg/m^3	18.8 mg/m^3	17.3 mg/m^3	15 mg/m^3	12 mg/m^3

a. Fresno's 1st Street Monitoring Station
Source: CARB Website, 2010

TABLE 3-12
San Joaquin Valley Air Basin – District Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone- 1 Hour	No Federal Standard	Non-attainment/Severe
Ozone - 8 Hour	Non-attainment	No State Standard
PM_{10}	Attainment	Non-attainment
$PM_{2.5}$	Non-attainment	Non-attainment
Carbon Monoxide	Unclassified/Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified	Attainment
Lead Particulates	No Federal Standard	Attainment

Source: CARB

Notes:

National Designation Categories

Non-Attainment Area: Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.

Unclassified/Attainment Area: Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant or meets the national primary or secondary ambient air quality standard for the pollutant.

State Designation Categories

Unclassified: A pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or non-attainment.

Attainment: A pollutant is designated attainment if the State standard for that pollutant was not violated at any site in the area during a three-year period.

Non-attainment: A pollutant is designated non-attainment if there was at least one violation of a State standard for that pollutant in the area.

Non-Attainment/Transitional: A subcategory of the non-attainment designation. An area is designated non-attainment/transitional to signify that the area is close to attaining the standard for the pollutant.

Environmental Setting

This section describes existing air quality within the San Joaquin Valley Air Basin and in Fresno County, including the identification of air pollutant standards, meteorological and topological conditions affecting air quality, and current air quality conditions. Air quality is described in relation to ambient air quality standards for criteria pollutants such as, ozone, carbon monoxide, and particulate matter less than 10 microns in size (PM_{10}). A complete description of the current air quality requirements is provided in the 2011 RTP and FTIP Air Quality Conformity Finding. The Conformity Finding provides a review of the current status of air quality planning and implementation, including the status of the current State Implementation Plan (SIP), Rate of Progress (ROP) Plans, and the implementation of various transportation control measures (TCMs) that are committed to in the current SIP and are needed to "offset" nonattainment emission increases associated with the Project.

Geographical Location

The SJVAB is comprised of eight counties: Fresno, Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare. Encompassing 24,840 square miles, the San Joaquin Valley is the second largest air basin in California. Cumulatively, counties within the Air Basin represent approximately 16 percent of the State's geographic area. The Air Basin is bordered by the Sierra Nevada Mountains on the east (8,000 to 14,492 feet in elevation), the Coastal Range on the west (4,500 feet in elevation), and the Tehachapi Mountains on the south (9,000 feet elevation). The San Joaquin Valley is open to the north extending to the Sacramento Valley Air Basin.

Figure 3-2 provides a map of California Air Basins. Air basins are geographic areas sharing a common "air shed." A description of the Air Basin in the County, as designated by CARB, is provided below.

For the purpose of regulating and monitoring air quality, Fresno County is serviced together with the other seven counties in the SJVAB by the San Joaquin Valley Air Pollution Control District (SJVAPCD), which regulates and monitors air quality within the SJVAB.

Topographic Conditions

Fresno County is located within the San Joaquin Valley Air Basin [as determined by the California Air Resources Board (CARB)]. Exhibit 3-3 provides a map of the Air Basin. Air basins are geographic areas sharing a common "air shed." A description of the Air Basin in the County, as designated by CARB, is provided below. Air pollution is directly related to the region's topographic features, which impact air movement within the Basin.

Wind patterns within the SJVAB result from marine air that generally flows into the Basin from the San Joaquin River Delta. The Coastal Range hinders wind access into the Valley from the west, the Tehachapis prevent southerly passage of airflow, and the high Sierra Nevada Mountain Range provides a significant barrier to the east. These topographic features result in weak airflow that becomes restricted vertically by high barometric pressure over the Valley. As a result, the SJVAB is highly susceptible to pollutant accumulation over time. Most of the surrounding mountains are above the normal height of summer inversion layers (1,500-3,000 feet).

Climatic Conditions

In addition to topographic conditions, the local climate can also contribute to air quality problems. Light winds and atmospheric stability provide frequent opportunities for pollutants to accumulate in the atmosphere. Wind speed and direction also play an important role in the dispersion and transport of air pollutants. Wind at the surface and aloft can disperse pollution by mixing vertically and by transporting it to other locations.

Ozone is classified as a "regional" pollutant due in part to the time required for ozone formation. Ozone, however, is not a directly emitted pollutant. Ozone is formed when its precursors, nitrogen oxides (NO_X) and volatile organic compounds (VOC), react in the presence of sunlight. Ozone precursors can be easily transported by winds from a source area before ozone concentrations peak. In addition, temperature and solar radiation are important factors in the chemistry of ozone formation because ozone is formed in a photochemical reaction requiring sunlight. Generally, higher temperatures create greater amounts of ozone, since reaction rates increase with temperature. However, extremely hot temperatures can lift or break the inversion layer.

Localized pollutants, carbon monoxide (CO) for example, may form high concentrations when wind speed is low. Temperature inversions can also be caused by surface radiant cooling. On clear winter nights, the ground loses heat at a rapid rate, causing air in contact with it to cool. Once formed, radiation inversions are similar to subsidence

inversions with respect to their effects on pollutant dilution. A description of specific climatic factors in the Air Basin is provided below.

Climate in the San Joaquin Valley is Mediterranean with moist cool winters and dry warm summers. Precipitation is confined primarily to the winter months. The Fresno County portion of the SJVAB had an average annual rainfall over a 30-year period of approximately 14 inches on the Valley floor. During summer months, wind speed and direction data indicate that winds usually originate at the north end of the Valley and flow in a southerly direction through the Tehachapi Pass into the Mojave Air Basin. These prevailing winds, known as "up-valley winds", originate with coastal breezes that enter the San Joaquin Valley through breaks in the coastal ranges, particularly though the Carquinez Straits in the San Francisco Bay Area and the Sacramento Valley Area; however, sources of air pollution, including stationary, mobile and area sources within the central and southern portions of the San Joaquin Valley, are considered to be a greater influence under most conditions. Peak ozone levels tend to be higher in the southernmost portion of the San Joaquin Valley, as the prevailing summer winds sweep precursors downwind of northern source areas.

During winter months, wind speed and direction data indicate that wind occasionally originates from the south end of the Valley and flows in a northerly direction. Also during the winter, the San Joaquin Valley experiences light variable winds, less than ten miles per hour (mph). Low wind speeds, combined with low inversion layers during the winter, create a climate conducive to high CO concentrations.

Wind speed and direction also change throughout the day. During the day, northerly winds prevail. However, in the late evening through the early morning, wind flow reverses direction due to the effects of cooler drainage wind from surrounding mountains. The interruption of northerly wind, including the evening and morning transition between the two wind flow patterns, is known as an "eddy". This adds to the complexity of regional wind flow and pollutant transport within the SJVAB.

Other Air Quality Determinants

In addition to climatic conditions (wind, lack of rain, etc.), air pollution can be caused by human/socioeconomic conditions. Air pollution in the SJVAB can be directly attributed to human activities, which cause air pollutant emissions. Human causes of air pollution in the Valley consist of population growth, urbanization (gas-fired appliances, residential wood heaters, etc.), mobile sources (i.e., cars, trucks, airplanes, trains, etc.), oil production, and agriculture. These are called anthropogenic, or human-caused, sources of emissions. The most significant factors, which are accelerating the decline of air quality in the SJVAB, are the Valley's rapid population growth and its associated increases in traffic, urbanization, and industrial activity.

Carbon monoxide emissions overwhelmingly come from mobile sources in the San Joaquin Valley; on-road vehicles contribute 65 percent, while other mobile vehicles, such as trains, planes, and off-road vehicles, contribute another 17 percent. The SJVAPCD is the agency empowered to regulate air pollutant emissions. The SJVAPCD regulates air quality through its permit authority for most types of stationary emission sources and through its planning and review activities for other sources.

Motor vehicles account for significant portions of regional gaseous and particulate emissions. Local large employers such as industrial plants can also generate substantial regional gaseous and particulate emissions. In addition, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.).

Ozone is the result of a photochemical reaction between Oxides of nitrogen (NO_x) and Reactive Organic Gases (ROG). Mobile sources contribute 64 percent of all NO_x emitted from anthropogenic sources. In addition, mobile sources contribute 53 percent of all the ROG emitted from sources within the San Joaquin Valley.

The principal factors that affect air quality in and around Fresno County are:

- The sink effect, climatic subsidence and temperature inversions and low wind speeds
- Automobile and truck travel
- Increases in mobile and stationary pollutants generated by local urban growth

Automobiles, trucks, buses and other vehicles using hydrocarbon fuels release exhaust products into the air. Each vehicle by itself does not release large quantities; however, when considered as a group, the cumulative effect is significant.

Other sources may not seem to fit into any one of the major categories or they may seem to fit in a number of them. These could include agricultural uses, dirt roads, animal shelters; animal feed lots, chemical plants and industrial waste disposal, which may be a source of dust, odors, or other pollutants. For Fresno County, this category includes several agriculturally related activities, such as plowing, harvesting, dusting with herbicides and pesticides and other related activities. Finally, industrial contaminants and their potential to produce various effects depend on the size and type of industry, pollution controls, local topography, and meteorological conditions. Major sources of industrial emissions in Fresno County consist of agricultural production and processing operations, wine production, and marketing operations.

The primary contributors of PM_{10} emissions in the San Joaquin Valley are fugitive windblown dust from "open" fields (38%) and road dust, both paved and unpaved (38%). Farming activities only contribute 14 percent of the PM_{10}.

Air Quality Standards

The Federal Clean Air Act (CAA), first adopted in 1963, and periodically amended since then, established National Ambient Air Quality Standards (NAAQS). A set of 1977 amendments determined a deadline for the attainment of these standards. That deadline has since passed. Other CAA amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources.

In 1988, the State of California passed the California Clean Air Act [(CCAA), State 1988 Statutes, Chapter 1568], which set forth a program for achieving more stringent California Ambient Air Quality Standards. The California Air Resources Board (ARB) implements State ambient air quality standards, as required in the CCAA, and cooperates with the federal government in implementing pertinent sections of the CAA Amendments (FCAAA). Further, CARB regulates vehicular emissions throughout the State. The SJVAPCD regulates stationary sources, as well as some mobile sources. Attainment of the more stringent State PM_{10} Air Quality Standards is not currently required.

The United States Environmental Protection Agency (EPA) uses six "criteria pollutants" as indicators of air quality, and has established for each of them a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS).

The SJVAPCD operates regional air quality monitoring networks that provide information on average concentrations of pollutants for which State or federal agencies have established ambient air quality standards. Descriptions of the six pollutants of importance in Fresno County follow.

- Ozone (1-hour and 8-hour)

The most severe air quality problem in the Air Basin is the high level of ozone. Ozone occurs in two layers of the atmosphere. The layer surrounding the earth's surface is the troposphere. Here, ground level, or "bad" ozone, is an air pollutant that damages human health, vegetation, and many common materials. It is a key ingredient of urban smog. The troposphere extends to a level about 10 miles up, where it meets the second layer, the stratosphere. The stratospheric, or "good" ozone layer, extends upward from about 10 to 30 miles and protects life on earth from the sun's harmful ultraviolet rays.

"Bad" ozone is what is known as a photochemical pollutant. It needs reactive organic gases (ROG), NO_x, and sunlight. ROG and NO_x are emitted from various sources throughout Fresno County. In order to reduce ozone concentrations, it is necessary to control the emissions of these ozone precursors.

Significant ozone formation generally requires an adequate amount of precursors in the atmosphere and several hours in a stable atmosphere with strong sunlight. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins.

Ozone is a regional air pollutant. It is generated over a large area and is transported and spread by wind. Ozone, the primary constituent of smog, is the most complex, difficult to control, and pervasive of the criteria pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is created by sunlight acting on other air pollutants (called precursors), specifically NO_x and ROG. Sources of precursor gases to the photochemical reaction that form ozone number in the thousands. Common sources include consumer products, gasoline vapors, chemical solvents, and combustion products of various fuels. Originating from gas stations, motor vehicles, large industrial facilities, and small businesses such as bakeries and dry cleaners, the ozone-forming chemical reactions often take place in another location, catalyzed by sunlight and heat. High ozone concentrations can form over large regions when emissions from motor vehicles and stationary sources are carried hundreds of miles from their origins. Approximately 50 million people lived in counties with air quality levels above the EPA's health-based national air quality standard in 1994. The highest levels of ozone were recorded in Los Angeles, closely followed by the San Joaquin Valley. High levels also persist in other heavily populated areas, including the Texas Gulf Coast and much of the Northeast.

While the ozone in the upper atmosphere absorbs harmful ultraviolet light, ground-level ozone is damaging to the tissues of plants, animals, and humans, as well as to a wide variety of inanimate materials such as plastics, metals, fabrics, rubber, and paints. Societal costs from ozone damage include increased medical costs, the loss of human and animal life, accelerated replacement of industrial equipment, and reduced crop yields.

Health Effects

While ozone in the upper atmosphere protects the earth from harmful ultraviolet radiation, high concentrations of ground-level ozone can adversely affect the human respiratory system. Many respiratory ailments, as well as cardiovascular disease, are aggravated by exposure to high ozone levels. Ozone also damages natural ecosystems, such as: forests and foothill communities; agricultural crops; and some man-made materials, such as rubber, paint, and plastic. High levels of ozone may negatively affect immune systems, making people more susceptible to respiratory illnesses, including bronchitis and pneumonia. Ozone accelerates aging and exacerbates pre-existing asthma and bronchitis and, in cases with high concentrations, can lead to the development of asthma in active children. Active people, both children and adults, appear to be more at risk from ozone exposure than those with a low level of activity. Additionally, the elderly and those with respiratory disease are also considered sensitive populations for ozone.

People who work or play outdoors are at a greater risk for harmful health effects from ozone. Children and adolescents are also at greater risk because they are more likely than adults to spend time engaged in vigorous activities. Research indicates that children under 12 years of age spend nearly twice as much time outdoors daily than adults. Teenagers spend at least twice as much time as adults in active sports and outdoor activities. In addition, children inhale more air per pound of body weight than adults, and they breathe more rapidly than adults. Children are less likely than adults to notice their own symptoms and avoid harmful exposures.

Ozone is a powerful oxidant—it can be compared to household bleach, which can kill living cells (such as germs or human skin cells) upon contact. Ozone can damage the respiratory tract, causing inflammation and irritation, and it can induce symptoms such as coughing, chest tightness, shortness of breath, and worsening of asthmatic symptoms. Ozone in sufficient doses increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Exposure to levels of ozone above the current ambient air quality standard leads to lung inflammation and lung tissue damage and a reduction in the amount of air inhaled into the lungs.

The standards for Ozone are not being met in the SJVAB for federal and state standards.

- Suspended PM (PM_{10} and $PM_{2.5}$)

Particulate matter pollution consists of very small liquid and solid particles that remain suspended in the air for long periods. Some particles are large or concentrated enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Particulate matter is a mixture of materials that can include smoke, soot, dust, salt, acids, and metals. Particulate matter is emitted from stationary and mobile sources, including diesel trucks and other motor vehicles; power plants; industrial processes; wood-burning stoves and fireplaces; wildfires; dust from roads, construction, landfills, and agriculture; and fugitive windblown dust. PM_{10} refers to particles less than or equal to 10 microns in aerodynamic diameter. $PM_{2.5}$ refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM_{10}. Particulates of concern are those that are 10 microns or less in diameter. These are small enough to be inhaled, pass through the respiratory system and lodge in the lungs, possibly leading to adverse health effects.

In the western United States, there are sources of PM_{10} in both urban and rural areas. Because particles originate from a variety of sources, their chemical and physical compositions vary widely. The composition of PM_{10} and $PM_{2.5}$ can also vary greatly with time, location, the sources of the material and meteorological conditions. Dust, sand, salt spray, metallic and mineral particles, pollen, smoke, mist, and acid fumes are the main components of PM_{10} and $PM_{2.5}$. In addition to those listed previously, secondary particles can also be formed as precipitates from chemical and photochemical reactions of gaseous sulfur dioxide (SO_2) and NO_x in the atmosphere to create sulfates (SO_4) and nitrates NO_3. Secondary particles are of greatest concern during the winter months where low inversion layers tend to trap the precursors of secondary particulates.

The CARB 2008 PM2.5 Plan builds upon the aggressive emission reduction strategy adopted in the 2007 Ozone Plan and strives to bring the valley into attainment status for the 1997 NAAQS for $PM_{2.5}$. The 2008 $PM_{2.5}$ Plan indicates that all planned reductions (from the 2007 Ozone Plan and state controls) plus significant reductions from new measures will be needed to attain the annual standard.

The following new controls considered in the 2008 $PM_{2.5}$ Plan include

- Tighter restrictions on residential wood burning and space heating
- More stringent limits on $PM_{2.5}$, SO_2, and NO_x emissions from industrial sources
- Measures to reduce emissions from prescribed burning and agricultural burning
- More effective work practices to control $PM_{2.5}$ in fugitive dust

The control strategy in this plan would also bring the valley closer to attainment status for the 2006 daily $PM_{2.5}$ standard. The district presented the draft 2008 $PM_{2.5}$ Plan to the District Governing Board on April 17, 2008, following a 30-day public comment period. This plan was delivered to the EPA in April 2008.

Health Effects

PM_{10} and $PM_{2.5}$ particles are small enough—about one-seventh the thickness of a human hair, or smaller—to be inhaled and lodged in the deepest parts of the lung where they evade the respiratory system's natural defenses. Health problems begin as the body reacts to these foreign particles. Acute and chronic health effects associated with high particulate levels include the aggravation of chronic respiratory diseases, heart and lung disease, and coughing, bronchitis, and respiratory illnesses in children. Recent mortality studies have shown a statistically significant direct association between mortality and daily concentrations of particulate matter in the air. Non-health-related effects include reduced visibility and soiling of buildings. PM_{10} can increase the number and severity of asthma attacks, cause or aggravate bronchitis and other lung diseases, and reduce the body's ability to fight infections. PM_{10} and $PM_{2.5}$ can aggravate respiratory disease and cause lung damage, cancer, and premature death.

Although particulate matter can cause health problems for everyone, certain people are especially vulnerable to adverse health effects of PM_{10}. These "sensitive populations" include children, the elderly, exercising adults, and those suffering from chronic lung disease such as asthma or bronchitis. Of greatest concern are recent studies that link PM_{10} exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM_{10} can also damage manmade materials and is a major cause of reduced visibility in many parts of the United States.

The standards for PM_{10} are being met in the SJVAB for federal standards but are not being met for state standards. The standards for $PM_{2.5}$ are not being met in the SJVAB for federal and state standards.

- Carbon Monoxide (CO)

Carbon monoxide (CO) is emitted by mobile and stationary sources as a result of incomplete combustion of hydrocarbons or other carbon-based fuels. CO is an odorless, colorless, poisonous gas that is highly reactive. CO is a byproduct of motor vehicle exhaust, contributes more than two thirds of all CO emissions nationwide. In cities, automobile exhaust can cause as much as 95 percent of all CO emissions. These emissions can result in high concentrations of CO, particularly in local areas with heavy traffic congestion. Other sources of CO emissions include industrial processes and fuel combustion in sources such as boilers and incinerators. Despite an overall downward trend in concentrations and emissions of CO, some metropolitan areas still experience high levels of CO.

Health Effects

CO enters the bloodstream and binds more readily to hemoglobin than oxygen, reducing the oxygen-carrying capacity of blood and thus reducing oxygen delivery to organs and tissues. The health threat from CO is most serious for those who suffer from cardiovascular disease. Healthy individuals are also affected but only at higher levels of exposure. At high concentrations, CO can cause heart difficulties in people with chronic diseases and can impair mental abilities. Exposure to elevated CO levels is associated with visual impairment, reduced work capacity, reduced manual dexterity, poor learning ability, difficulty performing complex tasks, and in prolonged, enclosed exposure, death.

The adverse health effects associated with exposure to ambient and indoor concentrations of CO are related to the concentration of carboxyhemoglobin (COHb) in the blood. Health effects observed may include an early onset of cardiovascular disease; behavioral impairment; decreased exercise performance of young, healthy men; reduced birth weight; sudden infant death syndrome (SIDS); and increased daily mortality rate.

Most of the studies evaluating adverse health effects of CO on the central nervous system examine high-level poisoning. Such poisoning results in symptoms ranging from common flu and cold symptoms (shortness of breath on mild exertion, mild headaches, and nausea) to unconsciousness and death.

The standards for Carbon Monoxide are being met in the SJVAB for federal standards.

- Nitrogen Dioxide (NO_2)

Nitrogen oxides (NO_x) is a family of highly reactive gases that are primary precursors to the formation of ground-level ozone and react in the atmosphere to form acid rain. NO_x is emitted from combustion processes in which fuel is burned at high temperatures, principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A brownish gas, NO_x is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates.

Health Effects

NO_x is an ozone precursor that combines with Reactive Organic Gases (ROG) to form ozone. See the ozone section above for a discussion of the health effects of ozone.

Direct inhalation of NO_x can also cause a wide range of health effects. NO_x can irritate the lungs, cause lung damage, and lower resistance to respiratory infections such as influenza. Short-term exposures (e.g., less than 3 hours) to low levels of nitrogen dioxide (NO_2) may lead to changes in airway responsiveness and lung function in individuals with preexisting respiratory illnesses. These exposures may also increase respiratory illnesses in children. Long-term exposures to NO_2 may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NO_x are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO_2 may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NO_x can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NO_x can also impair visibility. NO_x is a major component of acid deposition in California. NO_x may affect both terrestrial and aquatic ecosystems. NO_x in the air is a potentially significant contributor to a number of environmental effects such as acid rain and eutrophication in coastal waters. Eutrophication occurs when a body of water suffers an increase in nutrients that reduce the amount of oxygen in the water, producing an environment that is destructive to fish and other animal life.

NO_2 is toxic to various animals as well as to humans. Its toxicity relates to its ability to combine with water to form nitric acid in the eye, lung, mucus membranes, and skin. Studies of the health impacts of NO_2 include experimental studies on animals, controlled laboratory studies on humans, and observational studies.

In animals, long-term exposure to NO_x increases susceptibility to respiratory infections, lowering their resistance to such diseases as pneumonia and influenza. Laboratory studies show susceptible humans, such as asthmatics, exposed to high concentrations of NO_2, can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO_2 concentrations and daily mortality from respiratory and cardiovascular causes as well as hospital admissions for respiratory conditions.

NO_x contributes to a wide range of environmental effects both directly and when combined with other precursors in acid rain and ozone. Increased nitrogen inputs to terrestrial and wetland systems can lead to changes in plant species composition and diversity. Similarly, direct nitrogen inputs to aquatic ecosystems such as those found in estuarine and coastal waters can lead to eutrophication as discussed above. Nitrogen, alone or in acid rain, also can acidify soils and surface waters. Acidification of soils causes the loss of essential plant nutrients and increased levels of soluble aluminum, which is toxic to plants. Acidification of surface waters creates conditions of low pH and levels of aluminum that are toxic to fish and other aquatic organisms.

The standards for Nitrogen Dioxide are being met in the SJVAB for federal and state standards.

- Sulfur Dioxide (SO_2)

The major source of sulfur dioxide (SO_2) is the combustion of high-sulfur fuels for electricity generation, petroleum refining and shipping. High concentrations of SO_2 can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO_2 levels during moderate activity may result in breathing difficulties that can be accompanied by symptoms such as wheezing, chest tightness, or shortness of breath. Other effects that have been associated with longer-term exposures to high concentrations of SO_2, in conjunction with high levels of PM, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO_2 also is a major precursor to $PM_{2.5}$, which is a significant health concern and a main contributor to poor visibility. In humid atmospheres, sulfur oxides can react with vapor to produce sulfuric acid, a component of acid rain.

The standards for SO_2 are being met in the SJVAB.

- Lead (Pb)

Lead, a naturally occurring metal, can be a constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until recently to increase the octane rating in automobile fuel. Since the 1980s, lead has been phased out in gasoline, reduced in drinking water, reduced in industrial air pollution, and banned or limited in consumer products. Gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels; however, the use of leaded fuel has been mostly phased out. Since this has occurred the ambient concentrations of lead have dropped dramatically.

Exposure to lead occurs mainly through inhalation of air and ingestion of lead in food, water, soil, or dust. It accumulates in the blood, bones, and soft tissues and can adversely affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause neurological impairments such as seizures, mental retardation, and behavioral disorders. Even at low doses, lead exposure is associated with damage to the nervous systems of fetuses and young children. Effects on the nervous systems of children are one of the

primary health risk concerns from lead. In high concentrations, children can even suffer irreversible brain damage and death. Children 6 years old and under are most at risk, because their bodies are growing quickly. The standards for Lead are being met in the SJVAB for state standards.

Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. TACs are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TACs is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TACs are regulated on the basis of risk rather than specification of safe levels of contamination.

Existing air quality concerns within Fresno County and the entire SJVAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles. Particulate matter is caused by dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

- Odors

Typically odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another.

It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

- Sensitive Receptors

  A sensitive receptor is a location where human populations, especially children, seniors, and sick persons, are present and where there is a reasonable expectation of continuous human exposure to pollutants. Examples of sensitive receptors include residences, hospitals and schools.

Existing TCMs and Air Quality Mitigation

Until the passage of the CCAA, the primary role of air districts in California was the control of stationary sources of pollution such as industrial processes and equipment. With the passage of the FCAA and CCAA, air districts were required to implement transportation control measures (TCMs) and were encouraged to adopt indirect source control programs to reduce mobile source emissions. These mandates created the necessity for the District to work closely with cities and counties and with regional transportation planning agencies (RTPAs) to develop new programs.

A description of the various TCMs that have been incorporated into the SJVAPCD AQAP, Rate of Progress (ROP) Plans, and the SJVAPCD TCM Program, or have been identified as necessary to provide for positive air quality conformity findings, is included in the latest Air Quality Conformity Finding for the 2011 RTP and Federal Transportation Improvement Program (FTIP), dated October 2009. The Conformity Finding includes a complete description of each TCM contained in the current SIP, the SJVAPCD AQAP, the TCM Program, and in the ROP Plans. TCMs listed in the FTIP can be found on the Fresno COG website at:

http://www.fresnocog.org/files/FTIP/2011FTIP/2011%20Draft%20TIP%204-30-10%20pages%20150-268.pdf

Fresno County and its fifteen incorporated cities, private business, and government offices implement some of these programs including traffic flow improvements, public transit, park and ride lots, bicycling programs, and alternate work schedules. Central Valley Ridesharing provides rideshare programs in Fresno County and is administered by Fresno COG. It also provides ride matching within the four counties of Madera, Kings, Fresno, and Tulare. [1]

A complete description of the current air quality requirements is provided in the 2011 RTP and the latest Air Quality Conformity Findings are included on the Fresno COG website at:

http://www.fresnocog.org/files/Air%20Quality/Conformity/Fresno%20COG%202011%20Draft%20Conformity%20Analysis%204-28-10.pdf

Air Quality Management

Until the passage of the CCAA, the primary role of air districts in California was the control of stationary sources of pollution such as industrial processes and equipment. With the passage of the FCAA and CCAA, air districts were required to implement transportation control measures (TCMs) and were encouraged to adopt indirect source control programs to reduce mobile source emissions. These mandates created the necessity for the SJVAPCD to work closely with cities and counties and with regional transportation planning agencies (RTPAs) to develop new programs.

A description of various TCMs incorporated into the SJVAPCD Air Quality Attainment Plan (AQAP), Rate of Progress (ROP) Plans, and the SJVAPCD TCM Program, together with TCMs that have been identified as necessary to provide for positive air quality conformity findings is included in 2011 RTP Air Quality Conformity Determination. The

[1] Fresno COG – 2011 Regional Transportation Plan (RTP)

Conformity Determination includes a complete description of each TCM contained in the current SIP, the SJVAPCD AQAP, the TCM Program, and in the ROP Plans.

Responsibility for managing air quality in California is becoming increasingly regionalized. Air districts have the primary responsibility to control air pollution from all sources other than emissions directly from motor vehicles, which are the responsibility of EPA and CARB. Air districts regulate air quality through their permit authority for most types of stationary emission sources and through their planning and review activities for other sources. Further, air districts adopt and enforce rules and regulations to achieve State and federal ambient air quality standards and enforce applicable State and federal law. The CCAA requires each nonattainment district to reduce pertinent air contaminants by at least five percent per year until State Quality Standards are met.

Air Pollution Sources

The four major sources of air pollutant emissions in the SJVAB include industrial plants, motor vehicles, construction activities, and agricultural activities. Industrial plants account for significant portions of regional gaseous and particulate emissions. Motor vehicles, including those from large employers, generate substantial regional gaseous and particulate emissions. Finally, construction and agricultural activities can generate significant temporary gaseous and particulate emissions (dust, ash, smoke, etc.). In addition to these primary sources of air pollution, urban areas upwind from Fresno County, including areas north and west of the San Joaquin Valley, can cause or generate emissions that are transported into Fresno County. All four of the major pollutant sources affect ambient air quality throughout the Air Basin.

- Motor Vehicles

  Automobiles, trucks, buses and other vehicles using hydrocarbon fuels release exhaust products into the air. Each vehicle by itself does not release large quantities; however, when considered as a group, the cumulative effect is significant.

- Agricultural and Other Miscellaneous Activities

  Other sources may not seem to fit into any one of the major categories or they may seem to fit in a number of them. These could include agricultural uses, dirt roads, animal shelters, animal feed lots, chemical plants and industrial waste disposal, which may be a source of dust, odors, or other pollutants. For Fresno County, this category includes several agriculturally related activities, such as plowing, harvesting, dusting with herbicides and pesticides and other related activities.

- Industrial Plants

  Industrial contaminants and their potential to produce various effects depend on the size and type of industry, pollution controls, local topography, and meteorological conditions. Major sources of industrial emissions in Fresno County consist of agricultural production and processing operations, wine production, and marketing operations.

Methodology

The impact assessment for air quality focuses on potential effects the Project might have on air quality within the Fresno region. The assessment is not site or project-specific but is a regional analysis.

Criteria for Significance

The CEQA Guidelines establish that a significant impact would be expected to occur if the project would:

- Conflict with or obstruct with implementation of an applicable air quality plan
- Violate any air quality standard or contribute to an existing or projected air quality violation
- Result in cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard
- Expose sensitive receptors to substantial pollutant concentrations
- Create objectionable odors affecting a substantial number of people

Development of the Project would generate air pollutant emissions from a wide variety of stationary and mobile sources. Stationary source emissions, such as Particulate Matter, would be generated by transportation facility construction activities. Mobile source emissions would be generated by motor vehicle travel associated with construction activities and use of the proposed individual improvement projects. This section of the Air Quality Assessment addresses and analyzes the regional or area-wide and the localized air quality impacts associated with the Project. A discussion of significance criteria and an assessment of construction emissions are presented below based on the methodologies recommended in the SJVAPCD's *Guide for Assessing and Mitigating Air Quality Impacts*.

Short-Term Construction Impacts

Impact 3.3.1

Project Construction Impacts on Air Quality

Construction activities could increase short-term air emissions. This could be considered a less than significant impact.

Short-term impacts could result from the following construction-related sources:

- Construction equipment emissions
- Dust from grading and earthmoving operations
- Emissions from workers' vehicles traveling to and from construction sites

As individual transportation improvements are constructed, the activity at individual construction sites will involve grading and other earth-moving operations and the use of diesel and gasoline-powered construction equipment. These could generate exhaust emissions of carbon monoxide and nitrogen dioxide at the individual construction sites. Where asphalt is used, volatile organic compounds (VOC) could be released from asphalt when it is applied to the roadways' surfaces. If an individual construction site is located near existing homes or other sensitive receptors, such emissions could have the potential to result in significant short-term impacts at that particular location.

The SJVAPCD has developed thresholds of significance for individual construction projects. Project-level analysis conducted for CEQA purposes should estimate construction emissions for each individual improvement project based on the equipment used, vehicle miles traveled, and time allowed to complete the individual improvement project. Mitigation measures to reduce air quality impacts should be established in project-specific environmental documents. Some of the larger projects could have the potential to exceed the significance thresholds established by the District, creating significant short-term impacts. These impacts could occur in localized areas depending on the construction site locations, and could impact land uses, facilities and activities that may be occurring on these properties within vicinity of the projects requiring mitigation

Since the Project proposes more highway and arterial projects than the No Project Alternative, short-term construction emissions could be greater. However, construction-related impacts are expected to be temporary in nature and can generally be reduced to a less than significant level through the use of mitigation measures and through compliance with applicable existing city, county, state, and District regulations for reducing construction-related emissions. Therefore, the increase in construction activities proposed by the Project is expected to constitute a less than significant impact on a programmatic level. Nonetheless, individual projects may exceed the emissions thresholds, which could constitute project-level significant impacts. Individual projects shall be required to implement mitigation measures to reduce construction emissions as determined by the applicable analysis of such air quality project construction impacts.

Mitigation Measures

All mitigation measures will be included in project-level analysis, as appropriate. The individual improvement project proponent or local jurisdiction will be responsible for ensuring adherence to the mitigation measures prior to construction. Fresno COG will be provided with documentation indicating compliance with mitigation measures.

- Project implementation agencies will ensure implementation of mitigation measures to reduce PM and NOx emissions from construction sites, including:
    - Maintain on-site truck loading zones.
    - Configure on-site construction parking to minimize traffic interference and to ensure emergency vehicle access.
    - Provide temporary traffic control during all phases of construction activities to improve traffic flow.
    - Use best efforts to minimize truck idling to not more than two minutes during construction.
    - Apply non-toxic soil stabilizers (according to manufacturers' specifications) to all inactive construction areas.
    - During construction, replace ground cover in disturbed areas as quickly as possible.
    - During construction, enclose, cover, water twice daily or apply non-toxic soil binders (according to manufacturers' specifications) to exposed piles with 5 percent or greater silt content and to all unpaved parking or staging areas or unpaved road surfaces.
    - During the period of construction, install wheel washers where vehicles enter and exit unpaved roads onto paved roads, or wash off trucks and any equipment leaving the site each trip.
    - During the period of construction, assure that traffic speeds on all unpaved roads be reduced to 15 mph or less.
    - Pave all construction access roads at least 100 feet on to the site from permanent roadways.
    - Cover all haul trucks.

- Project implementation agencies will avoid individual improvement project designs requiring significant amounts of material, such as excavated soil and construction debris, to be transported from the site to disposal facilities. Construction sites will employ a balanced cut/fill ratio to the extent possible, thus reducing haul-truck trip emissions.

Significance After Mitigation

Less-than-significant.

Impact 3.3.2 – Point Source Impacts

Traffic conditions at some individual locations may lead to occasional localized carbon monoxide concentrations.

The proposed Project will improve traffic flows and reduce congestion system-wide, reducing the potential for carbon monoxide "hot spots" that can occur from exhaust of idling cars waiting to clear a heavily congested intersection or crossing. The Project is intended to reduce congested conditions throughout the system that is faced with a challenge to accommodate additional traffic generated by the more than 50 percent increase in population projected by the Year 2035. While the proposed improvements will respond to this challenge by accommodating additional traffic and reducing congestion (brought by that additional traffic) system-wide, exhaust emissions from cars at localized areas may, at certain times, create a potential for carbon monoxide concentrations, or hot spots, to develop under adverse atmospheric conditions that prevent a rapid dispersion of carbon monoxide. Currently, the Air Basin is in attainment of federal and State standards for carbon monoxide, and the carbon monoxide emissions are not a serious problem in the Basin. Nonetheless, because there is a potential for exhaust emissions from cars at localized areas to create an occasional hot spot, the following mitigation measure is proposed.

Mitigation Measures

At those facilities or intersections near sensitive receptors where carbon monoxide concentrations may exist, the implementing agency will reduce or alleviate these concentrations by improving traffic flows through improved signalization, restriping, addition of traffic lanes, and other improvements identified as part of the environmental review of an individual improvement project.

Significance After Mitigation

The Project will result in beneficial effects of system-wide improvement in traffic flows and reduced congestion, which would reduce the potential for forming carbon monoxide hot spots. At some locations where instances of congested conditions may occur near sensitive receptors, implementation of identified mitigation is anticipated to ensure improved traffic flows such that the potential for creating a hot spot will be reduced to a less-than-significant level.

Impact 3.3.3

Long-Term - Conflict with, or Obstruct, the Applicable Air Quality Plan, Contribute to a Violation of Air Quality Standards, Contribute Substantially to an Existing Air Quality Violation, or Result in a Cumulatively Considerable Net Increase of a Criteria Pollutant in a Non-Attainment Area.

The following analysis is a summary of the Conformity Analysis for the 2011 Federal Transportation Improvement Program (FTIP) and the 2011 Regional Transportation Plan (RTP). The complete Air Quality Conformity Analysis is available on Fresno COG's website at:

http://www.fresnocog.org/files/Air%20Quality/Conformity/Fresno%20COG%202011%20Draft%20Conformity%20Analysis%204-28-10.pdf

- Federal Air Quality Standards

The Clean Air Act Section 176(c) (42 U.S.C. 7506(c)) and U.S. Environmental Protection Agency (EPA) transportation conformity regulations (40 CFR 93 Subpart A) require that each new RTP and TIP be demonstrated to conform to the State Implementation Plan (SIP) before the RTP and TIP are approved by the MPO or accepted by the U.S. Department of Transportation (DOT). The conformity analysis is a federal requirement designed to demonstrate compliance with the national ambient air quality standards. However, because the San Joaquin Valley State Implementation Plan (SIP) for CO, PM_{10}, $PM_{2.5}$ and Ozone address attainment of both the state and federal standards, for these pollutants, demonstrating conformity to the federal standards is also an indication of progress toward attainment of the state standards. Compliance with the state air quality standards is provided on the pages following this federal conformity discussion.

- Conformity Requirements

The Federal transportation conformity regulations (40 Code of Federal Regulations Parts 51 and 93) specify criteria and procedures for conformity determinations for transportation plans, programs, and projects and their respective amendments. The Federal transportation conformity regulation was first promulgated in 1993 by the U.S. EPA, following the passage of amendments to the Federal Clean Air Act in 1990. The Federal transportation conformity regulation has been revised several times since its initial release to reflect both EPA rule changes and court opinions.

The conformity regulation applies nationwide to "all nonattainment and maintenance areas for transportation-related criteria pollutants for which the area is designated nonattainment or has a maintenance plan" (40 CFR 93.102). Currently, the San Joaquin Valley (or portions thereof) is designated as nonattainment with respect to Federal air quality standards for ozone, and particulate matter under 2.5 microns in diameter ($PM_{2.5}$); and has a maintenance plan for particulate matter under 10 microns in diameter (PM_{10}), as well as a maintenance plan for carbon monoxide (CO) for the urbanized/metropolitan areas of Kern, Fresno, Stanislaus and San Joaquin Counties. Therefore, transportation plans and programs for the nonattainment areas for the Fresno County area must satisfy the requirements of the Federal transportation conformity regulation.

Under the transportation conformity regulation, the principal criteria for a determination of conformity for transportation plans and programs are:

- The TIP and RTP must pass an emissions budget test using a budget that has been found to be adequate by EPA for transportation conformity purposes, or an interim emission test;
- The latest planning assumptions and emission models specified for use in conformity determinations must be employed;
- The TIP and RTP must provide for the timely implementation of transportation control measures (TCMs) specified in the applicable air quality implementation plans; and
- Interagency and public consultation.

On-going interagency consultation is conducted through the San Joaquin Valley Interagency Consultation Group to ensure Valley-wide coordination, communication and compliance with FCAA and CCAA requirements. Each of the eight Valley MPOs and the SJVAPCD are represented. The Federal Highway Administration (FHWA), Federal Transit Administration (FTA), the U.S. EPA, CARB and Caltrans are also represented on the committee. The final determination of conformity for the TIP and RTP is the responsibility of FHWA, and FTA within the U.S. DOT.

- Fresno County Conformity Tests

The conformity tests specified in the Federal transportation conformity regulations are: (1) the emissions budget test, and (2) the interim emission test. For the emissions budget test, predicted emissions for the TIP/RTP must be less than or equal to the motor vehicle emissions budget specified in the approved air quality implementation plan or the emissions budget found to be adequate for transportation conformity purposes. If there is no approved air quality plan for a pollutant for which the region is in nonattainment or no emission budget has been found to be adequate for transportation conformity purposes, the interim emission test applies. The Air Quality Conformity summarizes the applicable air quality implementation plans and conformity tests for ozone, PM_{10}, and $PM_{2.5}$.

Each of the SJVAPCD plans (2007 Ozone Plan, 2008 PM2.5 Plan, and 2007 PM_{10} Maintenance Plan, which relies on the 2003 PM_{10} Plan for emissions reductions measures) identifies a "budget" for measuring progress toward achieving attainment of the national air quality standard. A "budget" is, in effect, an emissions "threshold" or "not to exceed value" for specific years in which progress toward attainment of the standard must be measured. These specific years can also be described as “budget years" and are established to ensure achievement of the "budget" to demonstrate continued progress toward attainment of the national air quality standard. The term "base year" also reflects a "threshold" or "not to exceed" value against which future emissions from the 2011 RTP are measured.

The conformity regulation (Section 93.118[b] and [d]) requires documentation of the "budget years" for which consistency with motor vehicle emission "budgets" must be shown. In addition, any interpolation performed to meet tests for "budget years" in which specific analysis is not required need to be documented. For the selection of the analysis years, the conformity regulation requires: (1) that if the attainment year is in the time span of the transportation plan, it must be modeled; (2) the last year forecast in the transportation plan must be an analysis year; and (3) analysis years may not be more than ten years apart. In addition, the conformity regulation requires that conformity must be demonstrated for each "budget year." It is important to note, that although the conformity regulation requires modeling of several analysis years in addition to the “budget years," those additional analysis years must demonstrate that emissions in those years are less than the applicable motor vehicle emissions "budget." For example the 2011 this analysis models Ozone motor vehicle emissions from the 2011 RTP in the years 2011, 2014, 2017, 2023, 2025, and 2035. As Table 3-13 below shows, 2011, 2014, and 2017 are “budget years" and 2023 is the year of attainment. As described above, Ozone emissions for the 2025 and 2035 analysis years must be less than or equal to the 2017 "budget" to demonstrate compliance with the SJVAPCD 2008 Ozone Plan.

Section 93.118(b)(2) clarifies that when a maintenance plan has been submitted, conformity must be demonstrated for the last year of the maintenance plan and any other years for which the maintenance plan establishes budgets in the time frame of the transportation plan. Section 93.118(d)(2) indicates that a regional emissions analysis may be performed for any years, the attainment year, and the last year of the plan’s forecast. Other years may be determined by interpolating between the years for which the regional emissions analysis is performed.

Section 93.118(d)(2) indicates that the regional emissions analysis may be performed for any years in the time frame of the transportation plan provided they are not more than ten years apart and provided the analysis is performed for the attainment year (if it is in the time frame of the transportation plan) and the last year of the plan’s forecast period. Emissions in years for which consistency with motor vehicle emissions budgets must be demonstrated, as required in paragraph (b) of this section (i.e., each budget year), may be determined by interpolating between the years for which the regional emissions analysis is performed.

For $PM_{2.5}$, the attainment year is 2014 for both the 1997 and 2006 Standards. On March 8, 2005, EPA issued Guidance for Determining the “Attainment Year” for Transportation Conformity in new 8-hour ozone and $PM_{2.5}$

nonattainment areas (EPA, 2005b). Per FCAA section 172(a)(2), all $PM_{2.5}$ nonattainment areas will have an initial maximum statutory attainment date of April 5, 2010. However, the submitted 2008 $PM_{2.5}$ Plan shows that the San Joaquin Valley $PM_{2.5}$ nonattainment area can attain the annual $PM_{2.5}$ NAAQS in 2014. In addition, the attainment year for the 2006 $PM_{2.5}$ areas will be 2014.

TABLE 3-13
Emission Budget Years By Pollutant

Pollutant	Budget Years[1]	Attainment/ Maintenance Year	Intermediate Years	RTP Horizon Year
Ozone	2011/2014/2017	2023[2]	2025	2035
PM-10	NA	2020	2025	2035
PM2.5	2012	2014	2017/2025	2035

[1] Budget years that are not in the time frame of the transportation plan are not included as analysis years (e.g., CO 2003 and 2010, Ozone 2008, PM-10 2005, PM2.5 2009), although they may be used to demonstrate conformity.
[2] The attainment year for Serious 8-hour Ozone areas is 2013; however, the 2007 Ozone Plan requests reclassification to Extreme which has an attainment year of 2023.
Source: San Joaquin Valley Air Pollution Control District, 2007

- Ozone Precursors

The regional emissions analysis and forecasts for ozone precursors (ROG and NO_X) are summarized in Table 3-14. The summary of emissions forecasts is derived from outputs of the EMFAC 2007 Version 2.3 model[2] performed by Fresno COG staff during the preparation of the Air Quality Conformity. As indicated above, the words "budget" refers to the emissions "threshold" or "not to exceed value" for "budget years" in order demonstrate continued progress toward attainment of the state air quality standard.

[2] Note that EMFAC 2007 does not include any reductions in criteria pollutants that may be achieved by implementation of the Pavley GHG Emissions Standards. Although the Pavley GHG emissions standards limit only GHGs, it is likely that concomitant reductions in GHGs will occur. However, because there are not regulatory reductions of other criteria pollutants mandated, the reductions cannot be quantitatively assessed.

- Particulate Matter

  The regional emissions analysis and forecasts for particulate matter (PM_{10} and $PM_{2.5}$) are summarized in Table 3-14. The summary of emissions forecasts is derived from outputs of the EMFAC 2007 Version 2.3 model performed by Fresno COG staff during the preparation of the Air Quality Conformity. As indicated above, the words "budget" refers to the emissions "threshold" or "not to exceed value" for "budget years" in order demonstrate continued progress toward attainment of the state air quality standard. The words" base year" in the tables below also reflects a "threshold" or "not to exceed" value against which future emissions from the 2011 RTP are measured.

Results of the Conformity Analysis

A regional emissions analysis was conducted for the years 2011, 2012, 2014, 2017, 2018, 2020, 2023, 2025 and 2035 for each applicable pollutant. All analyses were conducted using the latest planning assumptions and emissions models. The major conclusions of the Fresno COG Conformity Analysis are:

- For carbon monoxide, the total regional on-road vehicle-related emissions associated with implementation of the 2011 FTIP and the 2011 RTP for the analysis years are projected to be less than the approved motor vehicle emissions budget established in the 2004 Revision to the California State Implementation Plan for Carbon Monoxide. The applicable conformity test for carbon monoxide is therefore satisfied.

- For ozone, the total regional on-road vehicle-related emissions (ROG and NO_X) associated with implementation of the 2011 FTIP and the 2011 RTP for all years tested are projected to be less than the adequate emissions budgets specified in the 2007 Ozone Plan. The conformity tests for ozone are therefore satisfied.

- For PM_{10}, the total regional vehicle-related emissions (PM_{10} and NO_X) associated with implementation of the 2011 FTIP and the 2011 RTP for all years tested are either (1) projected to be less than the approved emissions budgets, or (2) less than the emission budgets using the approved PM_{10} and NO_X trading mechanism for transportation conformity purposes from the 2007 PM_{10} Maintenance Plan. The conformity tests for PM_{10} are therefore satisfied.

- For $PM_{2.5}$, the total regional on-road vehicle-related emissions associated with implementation of the 2011 FTIP and the 2011 RTP for the analysis years are projected to be less than the adequate emission budgets specified in the 2008 $PM_{2.5}$ Plan. The conformity tests for $PM_{2.5}$ for both the 1997 and 2006 standards are therefore satisfied.

Based on the conformity analysis, the 2011 FTIP and the 2011 RTP conform to the applicable State Implementation Plan (SIP) and all applicable sections of the EPA's Transportation Conformity Rule.

- State Air Quality Standards

The San Joaquin Valley Air Pollution Control District is one of 35 air quality management districts that have prepared air quality management plans to accomplish a five percent annual reduction in emissions documenting progress toward achievement of the state ambient air quality standards.

TABLE 3-14
Conformity Results for RTP Projects
2011 Conformity Results Summary – Fresno

Pollutant	Scenario	Emissions Total			DID YOU PASS?	
		CO (tons/day)			CO	
Carbon Monoxide	2010 Budget	240				
	2017	84			YES	
	2018 Budget	240				
	2018	81			YES	
	2025	59			YES	
	2035	54			YES	
Ozone		ROG (tons/day)	NOx (tons/day)		ROG	NOx
	2011 Budget	15.5	47.9			
	2011	15.3	47.6		YES	YES
	2014 Budget	12.9	37.2			
	2014	12.7	36.8		YES	YES
	2017 Budget	11.1	29.1			
	2017	10.9	28.7		YES	YES
	2023	8.8	19.6		YES	YES
	2025	8.4	17.9		YES	YES
	2035	7.3	15.4		YES	YES
PM-10		PM-10 (tons/day)	NOx (tons/day)		PM-10	NOx
	Adjusted 2020 Budget	16.1	24.7			
	2020	15.1	23.1		YES	YES
	Adjusted 2020 Budget	16.4	22.8			
	2025	16.4	18.2		YES	YES
	Adjusted 2020 Budget	18.9	19.0			
	2035	18.9	15.6		YES	YES
1997 PM2.5 24-Hour & Annual Standards and 2006 24-Hour Standard		PM2.5 (tons/day)	NOx (tons/day)		PM2.5	NOx
	2012 Budget	1.9	44.2			
	2012	1.8	43.8		YES	YES
	2014	1.6	36.9		YES	YES
	2017	1.4	28.6		YES	YES
	2025	1.2	17.6		YES	YES
	2035	1.3	15.0		YES	YES

The SJVAPCD air quality management plans document required emissions reductions from all emissions sources, mobile and stationary. For this analysis, only on-road mobile source emissions are considered, as the 2011 RTP does not impact the implementation of any SJVAPCD regulations or incentives on other emissions source categories. As such, this analysis will not show the entire five percent reductions required by each of the SJVAPCD plans (for each applicable pollutant), but, will show the on-road mobile source share of the five percent per year reductions resulting from each of the SJVAPCD Plans. Required reductions from all other emissions sources can be found in the applicable SJVAPCD Plan.

The 2011 RTP demonstrates compliance with the list of comprehensive regulatory and incentive based measures contained in each plan by demonstrating that motor vehicle emissions resulting from the 2011 RTP are less than specified motor vehicle emissions "budgets" contained in the applicable SJVAPCD plan (2007 Ozone Plan, 2008 $PM_{2.5}$ Plan, and 2007 PM10 Maintenance Plan, which relies on the 2003 PM10 Plan for emissions reductions measures). To document compliance with the state air quality standards, each of these SJVAPCD plans identifies specific years in which progress toward attainment of the standard must be measured. These years are described as "budget" years because each of these SJVAPCD plans identifies motor vehicle emission "budgets" in which 2011 RTP motor vehicle emissions cannot exceed in order to ensure continued progress toward attainment of the state standard. For on-road mobile sources, the SJVAPCD plans identify the same emissions reduction strategies for both state and federal standards.

The SJVAPCD 2007 PM_{10} Maintenance Plan which relies on the 2003 PM_{10} Plan for emissions reductions measures allows trading from the motor vehicle emissions "budget" for the PM_{10} precursor NOx to the motor vehicle emissions budget for primary PM_{10} using a 1.5 to 1 ratio. The trading mechanism allows the agencies responsible for demonstrating transportation conformity in the San Joaquin Valley to supplement the 2005 budget for PM_{10} with a portion of the 2005 budget for NOx, and use these adjusted motor vehicle emissions budgets for PM_{10} and NOx to demonstrate transportation conformity with the PM_{10} Maintenance Plan for analysis years after 2005. The approved PM_{10} trading mechanism recognizes NOx precursor emissions result in the formation of PM_{10} emissions at a rate of 1 ton of PM_{10} for every 1.5 tons of NOx.

The trading mechanism is approved for analysis years after 2005. To ensure that the trading mechanism does not impact the ability to meet the NOx "budget" contained in the PM10 Maintenance Plan, the NOx emission reductions available to supplement the PM10 motor vehicle emissions "budget" shall only be those remaining after the NOx motor vehicle emissions "budget" has been met. For example in 2035, PM10 emissions equal 18.9 tons per day and NOx emissions equal 15.6 tons per day. Because 2035 NOx emissions are less than the 2020 NOx emissions "budget" (24.7 tons per day) from the SJVAPCD 2007 PM10 Maintenance Plan, emissions trading, as approved in the PM10 plan, is allowable. Trading between the PM10 emissions budget and the NOx emissions budget occurs utilizing the difference between the applicable NOx budget, which in this case is the 2020 "budget", and the actual NOx emissions resulting from the 2011 RTP. In 2035, the difference between the 2020 NOx budget and the 2035 NOx emissions is 9.1 tons per day. The 2020 NOx budget is a "not to exceed" number from the SIP, while the 2035 value is an actual modeled estimate. Emission trading as approved in the PM10 Plan utilizes 1.5 ton of NOx for every 1 ton of PM10 emissions remaining between the applicable NOx budget and the actual NOx emissions. Because the analysis demonstrates that PM10 precursor NOx emissions are significantly less than the emissions budgets, it is likelythat PM10 emissions resulting from the presence of the PM 10 precursor NOx will not form in 2035. This results in the ability to "trade" approximately 9.1 tons of NOx (which again is reflective of the difference between the 2020 "budget" and the 2035 PM10 emissions resulting from the 2011 RTP) for 2.8 tons of PM10 in 2035 because the formation of PM10 emissions resulting from precursor NOx emissions has been decreased.

Documentation of this can be found in the 2011 Conformity Analysis for the 2011 RTP and the 2011 FTIP, which was released for public comment concurrent to the 2011 RTP and 2011 RTP EIR.

Similar to the analysis documenting compliance with federal standards, the term "budget" after a scenario year represents a not to exceed value. The term base year after a scenario year in the tables below also reflects a not to exceed value against which future emissions from the 2011 RTP are measured.

For this analysis, only on-road mobile sources are considered as the 2011 RTP does not impact the implementation of any SJVAPCD regulations or incentives on other emissions source categories.

- Results of the Analysis

As shown in Tables 3-15 through 3-17, the total emissions in each scenario year for each pollutant is less than the emissions "budget" as established in the applicable SJVAPCD Plan. As previously noted, the emissions "budget" for each criteria pollutant is a "threshold" or "not to exceed" value for emissions. These tables demonstrate that the 2011 RTP contributes to positive progress toward the attainment of state ambient air quality standards. These tables also demonstrate that the 2011 RTP is consistent with the SJVAPCD plans, including their regulations and incentives relative to motor vehicle emissions budgets.

While Table 3-16 (PM_{10}) documents that PM_{10} emissions grow in 2035, it should be noted that PM_{10} and $PM_{2.5}$ precursor NOx emissions continue to decrease. As documented in the SJVAPCD 2007 PM_{10} Plan and 2008 $PM_{2.5}$ Plan, PM_{10} and $PM_{2.5}$ precursor emissions, such as NOx, are emissions that have the highest potential to form PM_{10} and $PM_{2.5,}$ respectively. By reducing the PM10 and $PM_{2.5}$ precursor emissions, the 2011 RTP will reduce the potential for the formation of PM_{10} and $PM_{2.5,}$ respectively. Additionally, it should be noted that PM_{10} emissions in 2035, as well as $PM_{2.5}$ emissions in 2035, still remain below the motor vehicle emissions thresholds (i.e. "budget year" and "base year"); therefore, the emissions comply with the SJVAPCD plan to reduce PM_{10} and $PM_{2.5}$ emissions. Collectively, this demonstrates progress toward meeting the state ambient air quality standards for PM_{10} and $PM_{2.5}$

TABLE 3-15
Ozone, ROG, and NOX Emissions Test (Summer Tons per Day)

	Emissions (Tons/Day)		%Below Budget		% Reduction/Year	
	ROG	NOX	ROG	NOX	ROG	NOX
2011 Budget	**15.5**	**47.9**	**N/A**	**N/A**	**N/A**	**N/A**
2011	15.3	47.6	1.29%	0.63%	-	-
2014 Budget	**12.9**	**37.2**	**N/A**	**N/A**	**N/A**	**N/A**
2014	12.7	36.8	1.55%	1.08%	5.66%	7.56%
2017 Budget	**11.1**	**29.1**	**N/A**	**N/A**	**N/A**	**N/A**
2017	10.9	28.7	1.80%	1.37%	4.72%	7.34%
2023	8.8	19.6	20.72%	32.65%	3.21%	5.28%
2025	8.4	17.9	24.32%	38.49%	2.27%	4.34%
2035	7.3	15.4	34.23%	47.08%	1.31%	1.40%

Source: Fresno COG, 2010

TABLE 3-16
PM10 Emissions (Annual Tons per Day)

Source: Fresno COG, 2010

	Emissions (Tons/Day)		%Below Budget		% Reduction/Year	
	PM-10	NOX	PM-10	NOX	PM-10	NOX
Adjusted 2020 Budget	**16.1**	**24.7**	**N/A**	**N/A**	**N/A**	**N/A**
2020	15.1	23.1	6.21%	6.48%	-	-
Adjusted 2020 Budget	**16.4**	**22.8**				
2025	16.4	18.2	0.00%	20.18%	-1.72%	4.24%
Adjusted 2020 Budget	**18.9**	**19.0**				
2035	18.9	15.6	0.00%	17.89%	-1.52%	1.43%

TABLE 3-17
PM2.5 Emissions - 1997 PM2.5
24-Hour & Annual Standards and 2006 24-Hour Standard

	Emissions (Tons/Day)		%Below Budget		% Reduction/Year	
	PM-2.5	NOX	PM-2.5	NOX	PM-2.5	NOX
2012 Budget	**1.9**	**44.2**	**N/A**	**N/A**	**N/A**	**N/A**
2012	1.8	43.8	5.26%	0.90%	-	-
2014	**1.6**	**36.9**	**15.79%**	**16.52%**	**5.56%**	**7.88%**
2017	1.4	28.6	26.32%	35.29%	4.17%	7.50%
2025	**1.2**	**17.6**	**36.84%**	**60.18%**	**1.79%**	**4.81%**
2035	1.3	15.0	31.58%	66.06%	-0.83%	1.48%

Source: Fresno COG, 2010

Significance After Mitigation

The project will result in beneficial effects of system-wide improvement in traffic flows and reduced congestion, which would reduce the potential for increased air emissions. The SJVAPCD 2007 Ozone Plan, 2007 PM_{10} Maintenance Plan, and the 2008 $PM_{2.5}$ Plan all document the SJVAPCD's plans to achieve the state ambient air quality standards, and as such, compliance with the regulations and incentives contained in the SJVAPCD plans contributes to the 5% per year reduction in emissions required to meet state standards. Based on the air quality analysis, the 2011 RTP conforms to the applicable SJVAPCD plans (2007 Ozone Plan, 2007 PM_{10} Maintenance Plan, and the 2008 $PM_{2.5}$ Plan) and demonstrates progress toward attainment of the state ambient air quality standards for PM_{10}, $PM_{2.5}$ and Ozone. As a result, while TCMs have been identified in the air quality conformity finding, the TCMs will not result in attainment of all pollutant standards over time or by the year 2035. As a result, long-term emission impacts cannot be reduced to a less than significant level even with the addition of projects and programs outlined in the RTP. The SEIR adopts all feasible mitigation measures for this impact.

Impact 3.3.4

Create Objectionable Odors Affecting a Substantial Number of People

Implementation of the RTP would not directly create or generate objectionable odors. Persons residing in the immediate vicinity of proposed improvements may be subject to temporary odors typically associated with roadway construction activities (diesel exhaust, hot asphalt, etc.). However, any odors generated by construction activities would be minor and would be short and temporary in duration. This is considered a *less than significant* impact.

Impact 3.3.5

Contribute Substantially to, or Result in a Cumulatively Considerable Net Increase of Mobile Source Air Toxics

- Mobile Source Air Toxics (MSAT) Background

Controlling air toxic emissions became a national priority with the passage of the Federal Clean Air Act Amendments (FCAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources. In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment. These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter.

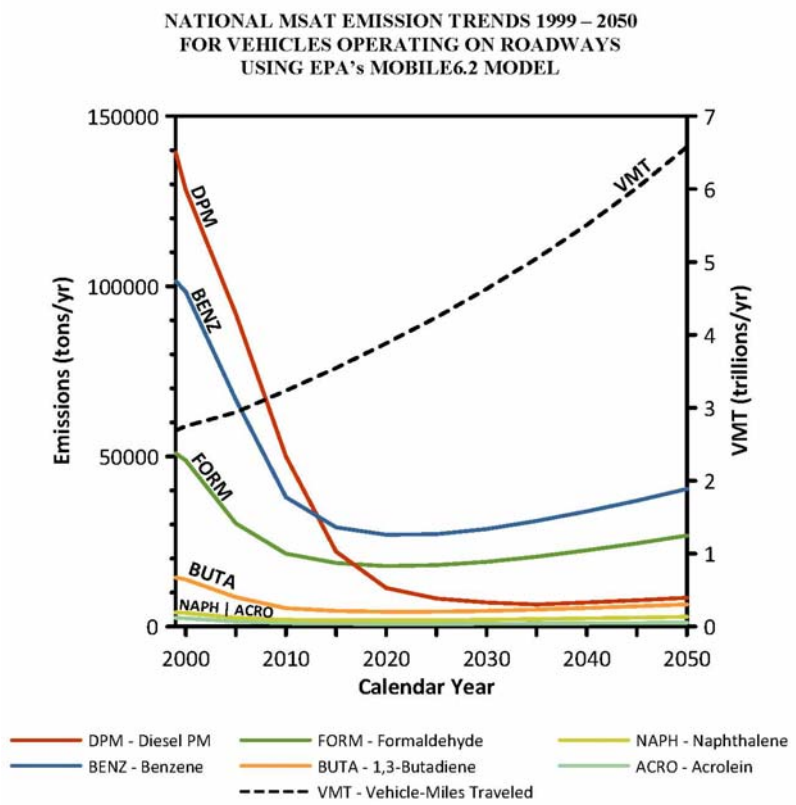
- National MSAT Trends

The 2007 EPA rule requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (VMT) increases by 145 percent, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in the chart on the following page.

- Local MSAT Trends (Monitoring in Fresno County)

Estimation of Risk: CARB monitors toxics throughout California, including one site in Fresno County: First Street. Data obtained from this monitoring site between 1989 and 2008 is shown in Tables 3-18 through 3-27. The estimated risks shown in CARB's annual toxics summaries in the tables below are estimated chronic cancer risk (acute risks and non-cancer risks are not shown) resulting from the inhalation pathway. These risks are expressed in terms of expected cancer cases per million population based on exposure to the annual mean concentration over 70 years. They are calculated using unit risk factors provided to the CARB by the California Office of Environmental Health Hazard Assessment.

Based on monitoring results in Tables 3-18 through 3-27, toxic emissions are declining except for formaldehyde. To address this issue, Fresno COG will continue to provide any available data as requested by the SJVAPCD as they research the cause and impacts. In addition, a mitigation measure has been added to address project level impacts.



Note: (1) Annual emissions of polycyclic organic matter are projected to be 561 tons/yr for 1999, decreasing to 373 tons/yr for 2050.
(2) Trends for specific locations may be different, depending on locally derived information representing vehicle-miles travelled, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors

TABLE 3-18
City of Fresno – First Street Monitoring Site
(1, 3, Butadiene Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2008	0.02	0.04	0.071	0.16	0.27	0.069	31	0.04	27
2007	0.02	0.02	0.086	0.26	0.35	0.105	29	0.04	32
2006	0.02	0.05	0.082	0.21	0.3	0.085	31	0.04	31
2005	0.02	0.07	0.101	0.29	0.47	0.117	34	0.04	38
2004	0.02	0.02	0.098	0.26	0.39	0.106	30	0.04	37
2003	0.02	0.06	0.127	0.3	0.58	0.151	31	0.04	48
2002	0.02	0.07	0.194	0.47	1	0.225	31	0.04	73
2001	0.02	0.1	0.182	0.42	0.9	0.226	30	0.04	68
2000	0.02	0.09	0.195	0.62	1	0.285	30	0.04	73
1999	0.02	0.15	0.214	0.46	0.84	0.225	31	0.04	80
1998	0.02	0.15	0.265	0.78	1	0.295	31	0.04	100
1997	0.02	0.14	0.233	0.71	1	0.268	31	0.04	87
1996	0.02	0.13	0.234	0.49	1	0.23	31	0.04	88
1995	0.02	0.17	0.3	0.78	1.4	0.34	30	0.04	113
1994	0.02	0.22	0.356	0.79	1.8	0.38	31	0.04	134
1993	0.02	0.2	0.342	0.84	1.4	0.347	30	0.04	129
1992	0.02	0.16	0.262	0.61	0.93	0.268	30	0.04	99
1991	0.02	0.19	0.459	1.21	1.7	0.509	30	0.04	173
1990	0.02	0.14	*	1.04	1.6	0.466	24	0.04	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-19
City of Fresno – First Street Monitoring Site
(Benzene Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2008	0.09	0.24	0.356	0.72	1	0.265	31	0.05	33
2007	0.06	0.24	0.374	1.02	1.2	0.367	29	0.05	35
2006	0.05	0.27	0.387	1	1.4	0.342	31	0.05	36
2005	0.07	0.32	0.408	1.03	1.5	0.375	34	0.05	38
2004	0.07	0.22	0.403	0.78	1.4	0.35	30	0.05	37
2003	0.1	0.31	0.546	1.2	1.8	0.498	31	0.05	51
2002	0.08	0.27	0.631	1.5	2.2	0.574	31	0.05	58
2001	0.08	0.4	0.61	1.26	3.1	0.672	30	0.05	56
2000	0.1	0.5	0.73	1.9	3.1	0.86	30	0.2	68
1999	0.1	0.5	0.8	1.7	2.9	0.73	31	0.2	74
1998	0.1	0.5	0.83	2.3	2.8	0.83	31	0.2	76
1997	0.1	0.5	1	2.4	5.8	1.19	31	0.2	92
1996	0.25	0.25	0.79	1.5	3.1	0.7	33	0.5	73
1995	0.25	1	1.24	2.4	4.5	1.11	30	0.5	115
1994	0.25	1	1.44	3.1	7.6	1.55	31	0.5	133
1993	0.25	1.2	1.35	3.6	4.4	1.26	30	0.5	125
1992	0.25	1	1.34	2.8	3.8	1.05	30	0.5	124
1991	0.25	1.6	2.42	5.4	7.3	2.04	30	0.5	224
1990	0.25	1.3	*	5.2	5.4	1.78	24	0.5	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-20
City of Fresno – First Street Monitoring Site
(Formaldehyde Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2008	0.7	2.9	3.13	5.1	6.8	1.65	30	0.1	23
2007	0.6	2.8	2.88	4.8	7.9	1.53	30	0.1	21
2006	0.6	3.2	3.41	5.5	8.8	1.9	31	0.1	25
2005	0.7	2.5	3	6	6.9	1.88	33	0.1	22
2004	1	2.2	2.57	3.9	5	1.15	31	0.1	19
2003	0.7	3.9	3.72	6	8	1.94	33	0.1	27
2002	1.1	3.5	4.16	5.6	18	3.2	32	0.1	31
2001	1.2	3.3	4.32	5.4	26	4.43	30	0.1	32
2000	0.9	2.6	3.56	6.4	7.9	1.92	28	0.1	26
1999	0.05	3.6	*	7.2	8.8	2.26	24	0.1	*
1998	0.05	3.4	3.42	5.9	7.2	1.91	27	0.1	25
1997	0.9	3.6	*	5.6	6.4	1.47	18	0.1	*
1996	0.5	3.4	*	7.8	8.4	2.26	22	0.1	*
1995	0.4	2.3	2.41	4.1	8.3	1.79	31	0.1	18
1994	0.2	1.8	2.01	4	7.4	1.61	31	0.1	15
1993	0.6	1.3	1.64	3.4	4.5	1.16	26	0.1	12
1992	0.5	1.5	*	4.3	5.3	1.57	21	0.1	*
1991	0.4	1.9	2.32	4.9	7.7	1.88	27	0.1	17
1990	0.05	1.3	*	5.4	9	2.32	23	0.1	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-21
City of Fresno – First Street Monitoring Site
(Acrolein Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit
2008	0.4	0.5	0.57	0.8	1.1	0.18	31	0.3
2007	0.15	0.4	0.51	0.8	2.2	0.38	29	0.3
2006	0.15	0.5	0.49	0.8	1.1	0.23	31	0.3
2005	0.15	0.4	0.41	0.6	0.9	0.21	34	0.3
2004	0.15	0.5	0.54	0.8	1.6	0.29	29	0.3
2003	0.15	0.7	*	1.1	1.4	0.33	15	0.3

Source: California Air Resources Board, 2010

TABLE 3-22
City of Fresno – First Street Monitoring Site
(Benzo(a)pyrene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.13	*	*	*	0.63	0.198	5	0.05	*
2004	0.025	0.025	0.21	0.63	2	0.415	30	0.05	0.2
2003	0.025	0.025	0.414	1.2	2.9	0.795	31	0.05	0.5
2002	0.025	0.025	0.466	1.52	2.7	0.729	30	0.05	0.5
2001	0.025	0.11	0.501	1	4.3	1.1	31	0.05	0.6
2000	0.025	0.025	0.491	1.15	4.6	1.08	30	0.05	0.5
1999	0.025	0.025	0.533	2.02	4.1	1.1	30	0.05	0.6
1998	0.025	0.06	0.618	2.4	4.3	1.18	31	0.05	0.7
1997	0.025	0.06	0.562	1.59	4.6	1.04	30	0.05	0.6
1996	0.025	0.025	0.515	2.6	3	1.02	24	0.05	0.6
1995	0.025	0.1	0.533	1.21	3.6	0.964	24	0.05	0.6
1994	0.025	0.51	*	2.61	5.5	1.5	14	0.05	*
1993	0.025	0.1	1.24	4.17	6.2	1.93	24	0.05	1
1992	0.025	0.08	0.624	2.19	4.7	1.18	24	0.05	0.7
1991	0.025	0.18	0.885	3.81	4.8	1.53	24	0.05	1
1990	0.025	0.07	*	1.52	23	5.38	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-23

City of Fresno – First Street Monitoring Site (Benzo(b)fluoranthene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.22	*	*	*	0.63	0.159	5	0.05	*
2004	0.025	0.025	0.258	0.81	2.3	0.469	30	0.05	0.03
2003	0.025	0.07	0.436	1.1	3	0.732	31	0.05	0.05
2002	0.025	0.025	0.508	1.31	3	0.774	30	0.05	0.06
2001	0.025	0.14	0.579	1.3	5.2	1.18	31	0.05	0.06
2000	0.025	0.08	0.551	1.27	4.5	1.15	30	0.05	0.06
1999	0.025	0.09	0.584	2.23	4.2	1.12	30	0.05	0.06
1998	0.025	0.12	0.621	2.4	3.8	1.01	31	0.05	0.07
1997	0.025	0.1	0.722	1.69	7.1	1.43	30	0.05	0.08
1996	0.025	0.09	0.489	2.06	2.8	0.877	24	0.05	0.05
1995	0.025	0.15	0.538	1.07	3	0.825	24	0.05	0.06
1994	0.1	0.77	*	3.1	5.5	1.51	14	0.05	*
1993	0.025	0.16	1.29	4.12	5.1	1.73	24	0.05	0.1
1992	0.025	0.14	0.718	2.41	5.2	1.26	24	0.05	0.08
1991	0.06	0.26	0.999	3.54	5.1	1.51	24	0.05	0.1
1990	0.05	0.15	*	1.77	22	5.12	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-24
City of Fresno – First Street Monitoring Site

(Benzo(g, h, i)perylene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit
2005	0.33	*	*	*	0.91	0.239	5	0.05
2004	0.025	0.11	0.442	1.11	3.9	0.812	30	0.05
2003	0.025	0.1	0.618	1.6	3.9	1.03	31	0.05
2002	0.025	0.11	0.629	1.92	2.8	0.815	30	0.05
2001	0.025	0.23	0.72	1.7	5.8	1.25	31	0.05
2000	0.025	0.16	0.738	1.77	5.3	1.34	30	0.05
1999	0.025	0.15	0.783	2.68	4.8	1.32	30	0.05
1998	0.025	0.26	0.718	2.2	4.1	1.11	31	0.05
1997	0.025	0.24	1.1	2.34	9.2	1.92	30	0.05
1996	0.025	0.21	0.657	2.28	3.7	1.02	24	0.05
1995	0.025	0.33	0.911	2.42	3.8	1.1	24	0.05
1994	0.27	1.4	*	4.52	6	1.78	14	0.05
1993	0.1	0.33	1.82	5.35	6.6	2.24	24	0.05
1992	0.025	0.23	0.904	2.75	5.2	1.36	24	0.05
1991	0.07	0.48	1.49	5.42	6.9	2.13	24	0.05
1990	0.11	*	*	*	15	4.96	8	0.05
1989	*	*	*	*	*	*	0	*

Source: California Air Resources Board, 2010

TABLE 3-25
City of Fresno – First Street Monitoring Site
(Benzo(k)fluoranthene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.1	*	*	*	0.26	0.065	5	0.05	*
2004	0.025	0.025	0.117	0.34	1	0.202	30	0.05	0.01
2003	0.025	0.025	0.209	0.5	1.5	0.354	31	0.05	0.02
2002	0.025	0.025	0.227	0.64	1.3	0.333	30	0.05	0.02
2001	0.025	0.06	0.249	0.49	2.1	0.495	31	0.05	0.03
2000	0.025	0.025	0.234	0.54	1.9	0.485	30	0.05	0.03
1999	0.025	0.025	0.25	0.95	1.8	0.481	30	0.05	0.03
1998	0.025	0.025	0.266	1.1	1.6	0.452	31	0.05	0.03
1997	0.025	0.025	0.27	0.69	2.2	0.482	30	0.05	0.03
1996	0.025	0.025	0.21	0.88	1.2	0.38	24	0.05	0.02
1995	0.025	0.06	0.251	0.52	1.5	0.402	24	0.05	0.03
1994	0.025	0.31	*	1.28	2.2	0.614	14	0.05	*
1993	0.025	0.07	0.563	1.74	2.4	0.789	24	0.05	0.06
1992	0.025	0.05	0.313	1.1	2.3	0.57	24	0.05	0.03
1991	0.025	0.1	0.395	1.42	2.3	0.658	24	0.05	0.04
1990	0.025	0.025	*	0.83	9.6	2.24	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-26
City of Fresno – First Street Monitoring Site
(Dbenz(a, h)anthracene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.025	*	*	*	0.11	0.035	5	0.05	*
2004	0.025	0.025	0.049	0.1	0.34	0.062	30	0.05	0.02
2003	0.025	0.025	0.075	0.23	0.41	0.104	31	0.05	0.03
2002	0.025	0.025	0.086	0.25	0.34	0.097	30	0.05	0.03
2001	0.025	0.025	0.08	0.23	0.58	0.136	31	0.05	0.03
2000	0.025	0.025	0.073	0.15	0.62	0.129	30	0.05	0.03
1999	0.025	0.025	0.078	0.25	0.73	0.145	30	0.05	0.03
1998	0.025	0.025	0.059	0.15	0.39	0.076	31	0.05	0.02
1997	0.025	0.025	0.066	0.13	0.52	0.101	30	0.05	0.03
1996	0.025	0.025	0.046	0.12	0.21	0.049	24	0.05	0.02
1995	0.025	0.025	0.045	0.07	0.21	0.051	24	0.05	0.02
1994	0.025	0.05	*	0.19	0.35	0.094	14	0.05	*
1993	0.025	0.025	0.119	0.34	0.43	0.135	24	0.05	0.05
1992	0.025	0.025	0.067	0.17	0.33	0.082	24	0.05	0.03
1991	0.025	0.025	0.133	0.36	0.72	0.179	24	0.05	0.05
1990	0.06	*	*	*	6.6	2.27	8	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

TABLE 3-27
City of Fresno – First Street Monitoring Site
(Indeno(1,2,3-cd)pyrene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.25	*	*	*	0.75	0.196	5	0.05	*
2004	0.025	0.025	0.27	0.87	2	0.442	30	0.05	0.03
2003	0.025	0.06	0.43	1.2	2.6	0.665	31	0.05	0.05
2002	0.025	0.025	0.515	1.31	2.8	0.766	30	0.05	0.06
2001	0.025	0.21	0.625	1.5	4.9	1.18	31	0.05	0.07
2000	0.025	0.09	0.585	1.56	4.3	1.12	30	0.05	0.06
1999	0.025	0.11	0.619	2.5	4.1	1.12	30	0.05	0.07
1998	0.025	0.16	0.698	2.7	4	1.09	31	0.05	0.08
1997	0.025	0.11	0.697	1.78	6.2	1.27	30	0.05	0.08
1996	0.025	0.1	0.509	2.14	2.9	0.871	24	0.05	0.06
1995	0.025	0.18	0.618	1.47	3.1	0.857	24	0.05	0.07
1994	0.13	0.79	*	2.58	4.7	1.26	14	0.05	*
1993	0.06	0.17	1.24	3.77	4.9	1.64	24	0.05	0.1
1992	0.025	0.16	0.809	2.78	5.6	1.37	24	0.05	0.09
1991	0.05	0.4	1.1	3.53	4.8	1.5	24	0.05	0.1
1990	0.025	*	*	*	26	8.83	8	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2010

- Diesel Particulate Emissions

Diesel Particulate emissions were quantified for the San Joaquin Valley portions of State Route 99 (SR-99) and Interstate 5 (I-5) to determine the impacts of diesel particulate matter (PM_{10} and $PM_{2.5}$) on the residents of the San Joaquin Valley. Future project emissions were compared to existing baseline emissions to determine if diesel particulate emissions increase over time as a result of the 2011 RTP.

The 2035 annual average daily traffic (AADT) projections for trucks travelling the I-5 and SR-99 corridors were developed using Caltrans truck traffic counts on the SR-99 and I-5 corridors from 2000 through 2008. To develop a "worst case" emissions estimate, vehicle miles of travel associated with the 2035 truck projections were developed by multiplying the length of SR-99 or I-5 by the highest truck volume segment (SR-99 Kern County JCT. RTE. 58 WEST, JCT. RTE. 178 EAST (Leg A): 32,450 Truck AADT and I-5 San Joaquin County I-5 Jct. Rte 205 West (Leg A): 42,240 Truck AADT) in 2008. This approach is deemed conservative, as all other I-5 and SR-99 segments have truck volumes less than or equal to the highest segment respectively. This approach assumes the highest truck volumes occur across all segments of SR-99 and I-5 in the San Joaquin Valley.

As all trucks are not diesel and do not emit diesel particulate, EMFAC2007 was utilized to determine which percentage of trucks from the Caltrans traffic counts for truck AADT were diesel. EMFAC2007 emissions rates were then utilized to quantify diesel particulate running exhaust emissions on the I-5 and SR-99 corridor respectively for the base year and the 2035 project. Table 3-28 shows the results of the analysis.

TABLE 3-28
Running Emissions Summary

(Diesel PM)

SR-99 Emissions (Tons/day)		
	2010	2035
Diesel PM10	1.290558	0.501899
Diesel PM2.5	1.161864	0.411517
VMT per day	3630872	5496425
I-5 Diesel Emissions (Tons/day)		
	2010	2035
Diesel PM10	2.902829	0.496579
Diesel PM2.5	2.61336	0.407155
VMT per day	3258028	5438169

Source: Fresno COG, 2010

Mitigation Measure

The following mitigation measure is presented to ensure that MSAT assessments are performed on a project-level, and to ensure that the most current tools and techniques are used for assessing the health risks of MSATs.

- As air toxics research continues, Fresno COG will coordinate with responsible agencies that utilize the tools and techniques developed for assessing health outcomes as a result of lifetime MSAT exposure. The potential health risks posed by MSAT exposure should continue to be factored into project-level decision-making in the context of environmental review. Specifically, at the project level, local agencies shall require or perform air toxic risk assessments to determine mobile source air toxic impacts.

Significance After Mitigation

The results from the diesel PM emissions summary for Fresno County show that the 2011 RTP design year emission levels will continue trending downward through the 2035 RTP horizon year. In addition, the U.S. EPA has published an MSAT assessment that demonstrates a national decreasing trend for MSATs including, acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), naphthalene, and polycyclic organic matter. California maintains stricter standards for clean fuels and emissions compared to the national standards, therefore it is expected that MSAT trends in California will decrease consistent with or more than the U.S. EPA's national projections. Implementation of the proposed project will have a ***less than significant*** impact.

ATTACHMENT B

3.5 CLIMATE CHANGE

This section includes a discussion of global climate change, its causes and the contribution of human activities, as well as a summary of existing greenhouse gas emissions. This section also describes the criteria for determining the significance of climate change impacts, and estimates the likely greenhouse gas emissions that would result from vehicular traffic and other emission sources related to the project. Where appropriate, mitigation measures are recommended to reduce project-related impacts.

Environmental Setting

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Global Climate Change (GCC) means a shift in the climate of the earth as a whole that occurs naturally as in the case of the ice age. According to the California Air Resources Board (CARB), the climate change that is occurring today differs from previous climate changes in both time and scale.

Gases that catch heat in the atmosphere are regularly called greenhouse gases (GHGs). The Earth's surface temperature would be about 61 degrees Fahrenheit colder than it is currently if it were not for the innate heat trapping effect of GHGs. The buildup of these gases in the earth's atmosphere is considered the source of the observed increase in the earth's temperature (global warming). Some greenhouse gases such as carbon dioxide occur naturally in nature and are emitted to the atmosphere through natural processes and as well as through some anthropocentric activities. Other GHGs (e.g., fluorinated gases) are created and emitted solely through human activities.

Since the Industrial Revolution (circa 1750), global concentrations of carbon dioxide (CO_2) have risen about 36%, chiefly due to the burning of fossil fuels. Questions remain about the amount of warming that will occur, how rapidly it will occur, and how the warming will affect the rest of the climate system, including weather events.

The United Nations Intergovernmental Panel on Climate Change constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The Panel concluded that a stabilization of GHGs at 400 to 450 parts per million (ppm) CO_2 equivalent concentration is required to keep global mean warming below 3.6º Fahrenheit (2º Celsius). This is presumed necessary to avoid dangerous climate change (Association of Environmental Professionals, 2007).

State law defines greenhouse gases as any of the following compounds: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g).) CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity. The characteristics of state defined GHGs are described below:

- Carbon dioxide – CO_2 results from fossil fuel combustion in stationary and mobile sources. It contributes to the greenhouse effect, but not to stratospheric ozone depletion. In 2004, CO_2 accounted for approximately 84 percent of total GHG emissions in the State (CEC, 2006);

- Methane – CH_4 can also be divided into anthropogenic (i.e., resulting from human activities and/or processes) and natural sources. Anthropogenic sources include rice agriculture, livestock, landfills, and waste treatment, some biomass burning, and fossil fuel combustion. Natural sources are wetlands, oceans, forests, fire, termites and geological sources. Anthropogenic sources currently account for more than 60 percent of the total global emissions; and

- Other regulated GHGs include Nitrous Oxide (N_20), Sulfur Hexafluoride (SF_6), Hydrofluorocarbons (HFC), and Perfluorocarbons (PFC) - These gases all possess heat-trapping characteristics that are greater than CO_2. Emission sources of nitrous oxide gases include, but are not limited to, waste combustion, waste water treatment, fossil fuel combustion, and fertilizer production. Because the volume of emissions is small, the net effect of nitrous oxide emissions relative to CO_2 or CH4 is relatively small. SF_6, HFC, and PFC emissions occur at even lower rates.

Over the last 200 years, human activities have caused substantial quantities of GHGs to be released into the atmosphere. These extra emissions are increasing GHG concentrations in the atmosphere, and enhancing the natural greenhouse effect, which is believed to be causing global warming. While manmade GHGs include naturally-occurring GHGs such as CO_2, methane, and N_2O, some gases, like HFCs, PFCs, and SF_6 are completely new to the atmosphere.

Certain other gases, such as water vapor, are short-lived in the atmosphere. Others remain in the atmosphere for significant periods of time, contributing to climate change over the long-term. Water vapor is excluded from the list of GHGs because it is short-lived in the atmosphere and its atmospheric concentrations are largely determined by natural processes, such as oceanic evaporation.

Globally, climate change has the potential to impact numerous environmental resources through potential, though uncertain, impacts related to future air temperatures and precipitation patterns. Scientific modeling predicts that continued GHG at or above current rates would induce more extreme climate changes during the 21st century than were observed during the 20th century. A warming of about 0.2°C (0.36° Fahrenheit) per decade is projected, and there are identifiable signs that global warming is taking place, including substantial ice loss in the Arctic.

However, the understanding of GHG emissions, particulate matter, and aerosols on global climate trends remains uncertain. In addition to uncertainties about the extent to which human activity rather than solar or volcanic activity is responsible for increasing warming, there is also evidence that some human activity has cooling, rather than warming, effects, as discussed in detail in numerous publications by the International Panel on Climate Change (IPCC), namely "Climate Change 2001, The Scientific Basis"(2001).

Climate change modeling shows that further warming could occur, which would induce additional changes in the global climate system during the current century. GHGs have the potential to affect the environment because such emissions are believed to contribute cumulatively to global climate change. Although GHG emissions from one single project will not by themselves cause global climate change, it is thought that GHG emissions from multiple projects, past, present and future throughout the world may collectively result in a cumulative impact with respect to global climate change. It is speculated that global climate change could contribute to rising sea levels, which can inundate low-lying areas; impact rainfall and snowfall, which could change water supply; affect habitat, which could affect biological resources, along with other unknown effects.

The consumption of nonrenewable energy (primarily gasoline and diesel fuel) associated with construction activities and the operation of passenger, public transit, and commercial vehicles results in GHG emissions that cause global climate change. In addition, alternative fuels like natural gas including CNG and liquefied natural gas (LNG), ethanol, and electricity (unless derived from solar, wind, nuclear, or another energy source that does not produce carbon emissions) also result in GHG emissions and contribute to global climate change.

Changes in California's climate and ecosystems are occurring at a time when the State's population is expected to increase from 34 to 59 million by 2040, according to the California Energy Commission (CEC). As such, the number of people potentially affected by climate change, as well as the amount of anthropogenic GHG emissions expected under a "business as usual" scenario, is expected to increase. Climate models indicate that temperatures in

California may rise by 4.7°F to 10.5°F by the end of the century if GHG emissions continue to proceed at a medium or high rate (CEC, 2006). Lower emission rates would reduce the projected warming to 3.0°F to 5.6° Fahrenheit. Almost all climate scenarios include a continuing trend of warming through the end of the century given the amounts of GHGs already released, and the difficulties associated with reducing emissions to a level that would stabilize the climate. Total GHG emissions in California have been approximated by CARB, which found that 468 MMT of CO_2E GHG emissions were produced in California in 2004. CARB also found transportation to be the source of 38 percent of the State's GHG emissions, followed by electricity generation at 25 percent and industrial sources at 20 percent.

The IPCC was established by the World Meteorological Organization and United Nations Environment Programme to assess scientific, technical, and socioeconomic information to further understand climate change, its potential impacts, and options for adaptation and mitigation. The IPCC predicts substantial increases in temperatures globally of between 1.1 to 6.4 degrees Celsius, depending on the scenario studied. This may impact California's natural environment in the following ways:

- Rising sea levels along the California coastline, particularly in the San Francisco Bay Area and within the San Joaquin Delta because of ocean expansion;
- Extreme-heat conditions, such as heat waves and very high temperatures, which could last longer and become more frequent;
- An increase in heat-related human deaths, infectious diseases, and a higher risk of respiratory problems caused by deteriorating air quality;
- Reduced snow pack and stream flow in the Sierra Nevada mountains, affecting winter recreation and water supplies;
- Potential increases in the severity of winter storms, affecting peak stream flows and flooding;
- Changes in growing season conditions that could affect California agriculture, causing variations in crop quality and yield;
- Changes in the distribution of plant and wildlife species because of changes in temperature, competition from colonizing species, changes in hydrologic cycles, changes in sea levels, and other climate-related effects;
- Increases in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century; and
- High potential for erosion of California's coastlines and seawater intrusion into the Delta and levee systems due to the rise in sea level.

The State of California GHG Inventory performed by CARB compiled statewide human sources of GHG emissions. It includes estimates for carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The current inventory covers the years 1990 to 2004, and is summarized in Table 3-32. When accounting for GHGs, all types of GHG emissions are expressed in terms of CO_2 equivalents (CO_2E) and are typically quantified in metric tons (MT) or millions of metric tons (MMT). Data sources used to calculate this GHG inventory include California state and federal agencies, international organizations, and industry associations. The calculation methodologies are consistent with guidance from the IPCC. The 1990 emissions level is the sum total of sources from all sectors and categories in the inventory. The inventory is divided into seven broad sectors and

categories. These sectors include: agriculture; commercial; electricity generation; forestry; industrial; residential; and transportation. Emissions of carbon dioxide and nitrous oxide are byproducts of fossil fuel combustion, among other sources. Methane, a highly potent GHG, results from off-gassing associated with agricultural practices and landfills, among other sources. Sinks of carbon dioxide include uptake by vegetation and dissolution into the ocean.

TABLE 3-32
State of California GHG Inventory (1990-2004)

SECTOR	TOTAL 1990 EMISSIONS (MMT CO_2E[2])	PERCENT OF TOTAL 1990 EMISSIONS	TOTAL 2004 EMISSIONS (MMTCO_2E)	PERCENT OF TOTAL 2004 EMISSIONS
Agriculture	23.4	5%	27.9	6%
Commercial	14.4	3%	12.8	3%
Electricity Generation	110.6	26%	119.8	25%
Forestry	0.2	<1%	0.2	<1%
Industrial	103.0	24%	96.2	20%
Residential	29.7	7%	29.1	6%
Transportation	150.7	35%	182.4	38%
Forestry Sinks (Absorption)	(6.7)		(4.7)	
Total	432	100%	468	100%

[1]Source: Staff Report – California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit, California Air Resources Board, November 16, 2007.
[2]MMT CO_2E refers to million metric tons of CO_2 equivalent emissions.

Regulatory

Federal

In 1988, the United Nations established the Intergovernmental Panel on Climate Change to assess the impacts of global warming and to develop strategies that nations could apply to curb global climate change. In 1992, the United States joined other countries around the world in signing the United Nations Framework Convention on Climate Change treaty with the goal of controlling greenhouse gas emissions.

As a result, the Climate Change Action Plan was developed to address reduction of greenhouse gases in the United States. The plan is comprised of more than 50 voluntary programs. Additionally, the Montreal Protocol was first signed in 1987 and considerably amended in 1990 and 1992. The Montreal Protocol instructs that the production and consumption of compounds that deplete ozone in the stratosphere--chlorofluorocarbons (CFCs), halons, carbon tetrachloride, and methyl chloroform--were to be phased out by 2000 (2005 for methyl chloroform).

Recently, in *Massachusetts v. EPA* (April 2, 2007), the U.S. Supreme Court held that GHGs fall within the Clean Air Act's definition of an "air pollutant" and directed the U. S. Environmental Protection Agency (EPA) to deem whether GHGs are affecting climate change. The EPA must regulate GHG emissions from automobiles under the Federal Clean Air Act (FCAA) if it is determined GHGs do affect climate change. Currently, the EPA has not yet begun rule-making proceedings to judge whether GHGs are contributing to climate change. In addition, Congress has enlarged the corporate average fuel economy (CAFE) of the U.S. automotive fleet. In December 2007, President George W. Bush signed a bill increasing the minimum average miles per gallon for cars, sport utility vehicles and light trucks to

35 miles per gallon by 2020. This rise in CAFE standards will result in a significant reduction in GHG emissions from automobiles, the largest single emitting GHG group in California.

On April 17, 2009, EPA issued its proposed endangerment finding for GHG emissions. EPA is proposing to find that greenhouse gases in the atmosphere endanger the public health and welfare of current and future generations. Concentrations of greenhouse gases are at unprecedented levels compared to the recent and distant past. EPA has stated that these high atmospheric levels are the unambiguous result of human emissions, and are very likely the cause of the observed increase in average temperatures and other climatic changes. The effects of climate change observed to date and projected to occur in the future – including but not limited to the increased likelihood of more frequent and intense heat waves, more wildfires, degraded air quality, more heavy downpours and flooding, increased drought, greater sea level rise, more intense storms, harm to water resources, harm to agriculture, and harm to wildlife and ecosystems – are effects on public health and welfare within the policies of the FCAA.

The U.S. EPA annually publishes the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* for estimating sources of GHGs that is generally consistent with the IPCC methodology developed in its *Guidelines for National Greenhouse Gas Inventories*.

- Energy Policy and Conservation Act

  The Energy Policy and Conservation Act of 1975 sought to ensure that all vehicles sold in the U.S. would meet certain fuel economy goals. Through this Act, Congress established the first fuel economy standards for on-road motor vehicles in the U.S. Pursuant to the Act, the National Highway Traffic and Safety Administration, as a part of the U.S. Department of Transportation (USDOT), is responsible for establishing additional vehicle standards and for revising existing standards.

  Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

- Energy Policy Act of 1992 (EPAct)

  The Energy Policy Act of 1992 (EPAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are included in EPAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. States are also required by the act to consider a variety of incentive programs to help promote AFVs.

- Energy Policy Act of 2005

  The Energy Policy Act of 2005 was signed into law on August 8, 2005. Generally, the act provides for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides

bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

- Federal Climate Change Policy

According to the EPA, "the United States government has established a comprehensive policy to address climate change" that includes slowing the growth of emissions; strengthening science, technology, and institutions; and enhancing international cooperation. To implement this policy, "the Federal government is using voluntary and incentive-based programs to reduce emissions and has established programs to promote climate technology and science." The federal government's goal is to reduce the GHG intensity (a measurement of GHG emissions per unit of economic activity) of the American economy by 18 percent over the 10-year period from 2002 to 2012. In addition, the EPA administers multiple programs that encourage voluntary GHG reductions, including "ENERGY STAR", "Climate Leaders", and Methane Voluntary Programs. In addition, there are other adopted federal plans, policies, regulations, or laws directly regulating GHG emissions.

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

- Endangerment Finding: The EPA Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO2), methane (CH4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6)--in the atmosphere threaten the public health and welfare of current and future generations.
- Cause or Contribute Finding: The EPA Administrator found that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.

These findings do not themselves impose any requirements on industry or other entities. However, this action was a prerequisite to finalizing the EPA's proposed greenhouse gas emission standards for light-duty vehicles. On May 7, 2010, the EPA and the Secretary of Transportation promulgated a joint final rule representing the first substantive federal action to limit emissions of greenhouse gases ("GHGs"). 75 Fed. Reg. 25324 (May 7, 2010). The rule ("GHG Mobile Source Rule") establishes emissions standards for passenger cars and light trucks under section 202 of the Clean Air Act, 42 U.S.C. § 7521, and corporate average fuel efficiency ("CAFE") standards under the Energy Policy and Conservation Act. The standards apply to 2012 and later model year vehicles and will require that fuel efficiency increase and GHG emissions decrease through 2016, by which time the projected combined car and truck fleet will need to achieve the equivalent of 35.5 miles per gallon.

State

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to, and consequences of, global climate change are not yet fully understood, global climate change is occurring. Every nation emits GHGs; therefore, global cooperation will be required to reduce the rate of GHG emissions, Currently no state regulations have been adopted in California that establish ambient air quality standards for GHGs; however, California has passed legislation directing CARB to develop actions to reduce GHG emissions.

- California Strategy to Reduce Petroleum Dependence (AB 2076)

The strategy, *Reducing California's Petroleum Dependence*, was adopted by the CEC and CARB in 2003. The strategy recommends that California reduce on-road gasoline and diesel fuel demand to 15 percent below 2003 demand levels by 2020 and maintain that level for the foreseeable future; the Governor and Legislature work to establish national fuel economy standards that double the fuel efficiency of new cars, light trucks, and sport utility vehicles (SUVs); and increase the use of non- petroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

- Assembly Bill 1493 (Pavley)

California Assembly Bill 1493 (Pavley) enacted on July 22, 2002, required CARB to develop and adopt regulations that reduce greenhouse gases emitted by passenger vehicles and light duty trucks. Regulations adopted by CARB would apply to 2009 and later model year vehicles. CARB estimated that the regulation would reduce climate change emissions from light duty passenger vehicles by an estimated 18 percent in 2020 and by 27 percent in 2030 (AEP 2007). In 2005, the CARB requested a waiver from EPA to enforce the regulation, as required under the Clean Air Act. Despite the fact that no waiver had ever been denied over a 40-year period, the then Administrator of the EPA sent Governor Schwarzenegger a letter in December 2007, indicating he had denied the waiver. On March 6, 2008, the waiver denial was formally issued in the *Federal Register*. Governor Schwarzenegger and several other states immediately filed suit against the federal government to reverse that decision. On January 21, 2009, CARB requested that EPA reconsider denial of the waiver. EPA scheduled a re-hearing on March 5, 2009. On June 30, 2009, EPA granted a waiver of Clean Air Act preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year.

- Executive Order S-3-05

Governor Schwarzenegger established Executive Order S-3-05 in 2005. This Executive Order set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The executive order directed the Secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The Secretary will also submit biannual reports to the Governor and Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Cal/EPA Secretary created the Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006, which proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs.

- Assembly Bill 32 (California Global Warming Solutions Act of 2006)

  California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500 - 38599), which established regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and established a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. This reduction will be accomplished by enforcing a statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

  AB 32 requires CARB to adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrived at the cap; institute a schedule to meet the emissions cap; and develop tracking, reporting, and enforcement mechanisms to ensure that the state reduces GHG emissions sufficient to meet the cap. AB 32 also includes guidance on instituting emissions reductions in an economically efficient manner, along with conditions to ensure that businesses and consumers are not unfairly affected by the reductions. Using these criteria to reduce statewide GHG emissions to 1990 levels by 2020 would represent an approximate 25 to 30 percent reduction in current emissions levels. However, CARB has discretionary authority to seek greater reductions in more significant and growing GHG sectors, such as transportation, as compared to other sectors that are not anticipated to significantly increase emissions. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020.

- Assembly Bill 1007

  Assembly Bill 1007, (Pavley, Chapter 371, Statutes of 2005) directed the CEC to prepare a plan to increase the use of alternative fuels in California. As a result, the CEC prepared the State Alternative Fuels Plan in consultation with the state, federal, and local agencies. The plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. The Plan assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

- Bioenergy Action Plan – Executive Order #S-06-06

  Executive Order #S-06-06 establishes targets for the use and production of biofuels and biopower and directs state agencies to work together to advance biomass programs in California while providing environmental protection and mitigation. The executive order establishes the following target to increase the production and use of bioenergy, including ethanol and biodiesel fuels made from renewable resources: produce a minimum of 20 percent of its biofuels within California by 2010, 40 percent by 2020, and 75 percent by 2050. The executive order also calls for the state to meet a target for use of biomass electricity.

- Executive Order S-1-07

  Executive Order S-1-07, which was signed by Governor Schwarzenegger in 2007, proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California

by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure to meet the mandates in AB 32. On April 23, 2009, CARB approved the proposed regulation to implement the LCFS. The LCFS will reduce GHG emissions from the transportation sector in California by about 16 MMT in 2020, and is designed to reduce California's dependence on petroleum, create a lasting market for clean transportation technology, as well as stimulate the production and use of alternative, low-carbon fuels. The LCFS is designed to provide a durable framework that uses market mechanisms to spur the steady introduction of lower carbon fuels. This framework establishes performance standards that fuel producers and importers must meet each year beginning in 2011. One standard is established for gasoline and the alternative fuels that can replace it. A second similar standard is set for diesel fuel and its replacements.

The standards are "back-loaded" meaning that more reductions are required in the last five years than the first five years. This schedule allows for the development of advanced fuels that are lower in carbon than today's fuels and the market penetration of plug-in hybrid electric vehicles, battery electric vehicles, fuel cell vehicles, and flexible fuel vehicles. It is anticipated that compliance with the LCFS will be based on a combination of strategies involving lower carbon fuels and more efficient, advanced-technology vehicles.

- Climate Action Program at Caltrans

The California Department of Transportation, Business, Transportation, and Housing Agency, prepared a Climate Action Program in response to new regulatory directives. The goal of the Climate Action Program is to promote clean and energy efficient transportation, and provide guidance for mainstreaming energy and climate change issues into business operations. The overall approach to lower fuel consumption and CO_2 from transportation is twofold: (1) reduce congestion and improve efficiency of transportation systems through smart land use, operational improvements, and Intelligent Transportation Systems; and (2) institutionalize energy efficiency and GHG emission reduction measures and technology into planning, project development, operations, and maintenance of transportation facilities, fleets, buildings, and equipment.

The reasoning underlying the Climate Action Program is the conclusion that "the most effective approach to addressing GHG reduction, in the short-to-medium term, is strong technology policy and market mechanisms to encourage innovations. Rapid development and availability of alternative fuels and vehicles, increased efficiency in new cars and trucks (light and heavy duty), and super clean fuels are the most direct approach to reducing GHG emissions from motor vehicles (emission performance standards and fuel or carbon performance standards)."

- Senate Bill 97

SB 97, signed August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directed the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA, by July 1, 2009. The Resources Agency was required to certify and adopt those guidelines by January 1, 2010. SB 97 also removed, both retroactively and prospectively, the legitimacy of litigation alleging inadequate CEQA analysis of effects of GHG emissions in the environmental review of projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision was repealed by operation of law on January 1, 2010; at that time, any such projects that remain unapproved would no longer be protected against litigation claims of failure to adequately address climate change issues. In the future, this bill will only protect a handful of public agencies from CEQA challenges on certain types of projects, and only for a few years' time.

As set forth more fully below, in June 2008, OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible (Governor's Office of Planning and Research, 2008*)*. OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance, as described in Section 15064.7 of *CEQA Guidelines* that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

Senate Bill 97 (Chapter 185, 2007) required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the State CEQA Guidelines for addressing greenhouse gas emissions. OPR prepared its recommended amendments to the State CEQA Guidelines to provide guidance to public agencies regarding the analysis and mitigation of greenhouse gas emissions and the effects of greenhouse gas emissions in draft CEQA documents. The Amendments became effective on March 18, 2010.

- Senate Bill 375

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPO's Regional Transportation Plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects may not be eligible for funding programmed after January 1, 2012.

This law also extends the minimum time period for the regional housing needs allocation cycle from five years to eight years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the Regional Transportation Plan (and associated SCS or APS). However, new provisions of CEQA would incentivize (through streamlining and other provisions) qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

- California Climate Action Registry General Reporting Protocol

The California Climate Action Registry (CCAR) was established in 2001 by SB 1771 and SB 527 (Chapter 1018, Statutes of 2000, and Chapter 769, Statutes of 2001, respectively) as a nonprofit voluntary registry for GHG emissions. The purpose of the CCAR is to help companies and organizations with operations in the State to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry.

This protocol provides the principles, approach, methodology, and procedures required for participation in CCAR. It is designed to support the complete, transparent, and accurate reporting of an organization's GHG emissions inventory in a fashion that minimizes the reporting burden and maximizes the benefits associated with

understanding the connection between fossil fuel consumption, electricity use, and GHG emissions in a quantifiable manner. The most updated version of this protocol was prepared in April 2008. All cabinet-level state agencies and departments have joined the CCAR. Membership in the CCAR means that all members of the Governor's Cabinet will be reporting their GHG emissions on a yearly basis.

- California Code of Regulations Title 24

Although not originally intended to reduce greenhouse gas emissions, California Code of Regulations Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The GHG emission inventory was based on Title 24 standards as of October 2005; however, Title 24 has been updated as of 2008. Energy efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in greenhouse gas emissions. Therefore, increased energy efficiency results in decreased greenhouse gas emissions.

- CAPCOA January 2008 CEQA and Climate Change

In January 2008, the California Air Pollution Control Officers Association (CAPCOA) issued a "white paper" on evaluating GHG emissions under CEQA. The CAPCOA white paper strategies are not guidelines and have not been adopted by any regulatory agency; rather, the paper is offered as a resource to assist lead agencies in considering climate change in environmental documents.

The CAPCOA white paper addresses what constitutes new emissions, how baseline emissions should be established, what should be considered cumulatively considerable under CEQA, what a business as usual (BAU) scenario means, and whether an analysis should include life-cycle emissions. The CAPCOA white paper also contains a Climate Change Significance Criteria Flow Chart that proposes a tiered approach to determining significance under CEQA. The flow chart would consider a proposed plan's impact to be less than significant if a General Plan for the project area exists that is in compliance with AB 32 (showing that GHG emissions for 2020 would be less than 1990 emissions for the plan area). The flow chart would consider a proposed project's impact to be significant unless one of the following can be demonstrated:

- The project is exempt under SB 97;
- The project is on the "Green List" (or a list of projects that are deemed a positive contribution to California efforts to reduce GHG emissions); A General Plan for the project area exists that is in compliance with AB 32; and/or
- GHG emissions are analyzed and mitigated to less-than-significant.

The CAPCOA white paper considers GHG impacts to be exclusively cumulative impacts.

- CARB Climate Change Proposed Scoping Plan

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap of CARB's plans to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB has estimated that the 1990 GHG emissions level was 427 MMT net CO_2e (CARB 2007b). CARB estimates that a reduction of 173 MMT net CO_2e emissions below BAU would be required by 2020 to meet the 1990 levels (CARB, 2007b). This amounts to a 15 percent reduction from today's levels, and a 30 percent reduction from projected BAU levels in 2020 (CARB, 2008a).

CARB's Scoping Plan calculates 2020 BAU emissions as those expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors, i.e. transportation, electrical power, commercial and residential, industrial etc. CARB used three-year average emissions, by sector, for 2002-2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32. CARB's Scoping Plan also breaks down the amount of GHG emissions reductions CARB recommends for each emissions sector of the state's GHG inventory. CARB's Scoping Plan calls for the largest reductions in GHG emissions to be achieved by implementing the following measures and standards:

- Improved emissions standards for light-duty vehicles (estimated reductions of 31.7 MMTCO_2E);
- The LCFS (15.0 MMT CO_2E);
- Energy efficiency measures in buildings and appliances, and the widespread development of combined heat and power systems (26.3 MMT CO_2E); and
- A renewable portfolio standard for electricity production (21.3 MMT CO_2E).

CARB has identified a GHG reduction target of 5 MMT (of the 174 MMT total) for local land use changes (Table 2 of CARB's Scoping Plan), by Implementation of Reduction Strategy T-3 regarding Regional Transportation-Related GHG Targets. Additional land use reductions may be achieved as SB 375 is implemented. CARB's Scoping Plan states that successful implementation of the plan relies on local governments' land use, planning, and urban growth decisions because local governments have primary authority to plan, zone, approve, and permit land development to accommodate population growth and the changing needs of their jurisdictions. CARB further acknowledges that decisions on how land is used will have large effects on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. CARB's Scoping Plan does not include any direct discussion about GHG emissions generated by construction activity. The measures approved by the Board are being developed to be in place by 2012. CARB's Scoping Plan expands the list of nine Discrete Early Action Measures to a list of 39 Recommended Actions contained in Appendices C and E of CARB's Scoping Plan.

- OPR June 2008 Technical Advisory on CEQA and Climate Change

SB 97 directs the Governor's Office of Planning and Research (OPR) to develop guidelines for the mitigation of GHG emissions or the effects of GHG emissions under CEQA. OPR is required to prepare and transmit these guidelines by July 1, 2009 for certification and adoption by January 1, 2010. In the interim, a June 2008 Technical Advisory provides informal guidance for public agencies as they address the issue of climate change in their CEQA documents. The June 2008 Technical Advisory offers recommendations for identifying GHG emissions, determining significance under CEQA, and mitigating impacts.

The Advisory states that lead agencies under CEQA should develop their own approach to performing a climate change analysis for projects that generate GHG emissions. It also states that the lead agency should assess whether project emissions are individually or cumulatively significant, and implement strategies to avoid, reduce, or otherwise mitigate the impacts of those emissions when impacts are potentially significant. However, CARB's subsequently released draft thresholds acknowledge that the GHG analysis should be on a cumulative basis as GHG is a global phenomenon. Regional agencies can attempt to reduce GHG emissions through their planning processes. For example, regional transportation planning agencies can adopt plans and programs that address congestion relief and reduce VMT.

In April 2009, OPR published its proposed revisions to CEQA to address GHG emissions. The amendments to CEQA indicate the following:

- Climate action plans and other greenhouse gas reduction plans can be used to determine whether a project has significant impacts, based upon its compliance with the plan;

- Local governments are encouraged to quantify the greenhouse gas emissions of proposed projects, noting that they have the freedom to select the models and methodologies that best meet their needs and circumstances. The section also recommends consideration of several qualitative factors that may be used in the determination of significance, such as the extent to which the given project complies with state, regional, or local GHG reduction plans and policies. OPR does not set or dictate specific thresholds of significance. Consistent with existing CEQA Guidelines, OPR encourages local governments to develop and publish their own thresholds of significance for GHG impacts assessment;

- When creating their own thresholds of significance, local governments may consider the thresholds of significance adopted or recommended by other public agencies, or recommended by experts;

- New amendments include guidelines for determining methods to mitigate the effects of greenhouse gas emissions can be found in Appendix F of the CEQA Guidelines;

- OPR is clear to state that "to qualify as mitigation, specific measures from an existing plan must be identified and incorporated into the project; general compliance with a plan, by itself, is not mitigation;" and

- OPR emphasizes the advantages of analyzing GHG impacts on an institutional, programmatic level. OPR therefore approves tiering of environmental analyses and highlights some benefits of such an approach.

- OPR January 8, 2009 Preliminary Draft CEQA Guideline Amendments for GHG Emissions

In January 2009, OPR released preliminary proposed amendments to the *CEQA Guidelines* regarding GHG emissions. No significance threshold was included in the draft and the guidelines afford the customary deference provided to lead agencies in their analysis and methodologies. The introductory preface to the amendments recommended that CARB set state-wide thresholds of significance. CARB released draft thresholds, as referenced below. OPR emphasized the necessity of having a consistent threshold available to analyze projects, and the analyses should be performed based on the best available information. For example, if a lead agency determines that GHGs may be generated by a proposed project, the agency is responsible for quantifying estimated GHG emissions by type and source. The guidelines provide the following recommendations for determining the significance of GHG emissions under draft Section 15064.4:

a. The determination of the significance of greenhouse gas emissions calls for a careful judgment by the lead agency consistent with the provisions in Section 15064. A lead agency should make a good-faith effort, based on available information, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

    1. Use a model or methodology to quantify greenhouse gas emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; or
    2. Rely on a qualitative analysis or performance based standards.

b. A lead agency may consider the following when assessing the significance of impacts from greenhouse gas emissions on the environment:

1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project.

The amendments reiterated that the analysis of GHG impacts is cumulative. Section 15130 (f) provides that an EIR shall analyze GHG emissions resulting from a proposed project when the incremental contribution of those emissions may be cumulatively considerable. On April 13, 2009, OPR submitted its proposed amendments to the State *CEQA Guidelines* for GHG emissions to the Secretary for Natural Resources, as required by Senate Bill 97 (Chapter 185, 2007). The Natural Resources Agency conducted formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by Senate Bill 97. On December 30, 2009, the Resources Agency approved the new GHG guidelines as amendments to the existing CEQA guidelines. The revised guidelines took effect on March 18, 2010.

- CARB Preliminary Draft Staff Proposal, October 2008

Separate from CARB's Scoping Plan approved in December 2008, CARB issued a Staff Proposal in October 2008, as its first step toward developing recommended statewide interim thresholds of significance for GHGs that may be adopted by local agencies for their own use. The proposal does not attempt to address every type of project that may be subject to CEQA, but instead focuses on common project types that, collectively, are responsible for substantial GHG emissions – specifically, industrial, residential, and commercial projects. CARB is developing thresholds in these sectors to advance climate objectives, streamline project review, and encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state. These draft thresholds are under revision in response to voluminous comments received. Finalized thresholds are expected sometime in 2010.

CARB staff's objective in this proposal is to develop a threshold of significance that would require the vast majority (approximately 90 percent statewide) of GHG emissions from new industrial projects to be subject to CEQA's requirement to impose feasible mitigation. CARB believes this can be accomplished with a threshold that allows small projects to be considered insignificant. CARB staff used existing data for the industrial sector to derive a proposed hybrid threshold. The threshold consists of a quantitative threshold of 7,000 metric tons of CO_2E per year (MT/year CO_2E) for operational emissions (excluding transportation), and performance standards for construction and transportation emissions. These performance standards have not yet been developed.

<u>Regional</u>

- San Joaquin Valley Air Pollution Control District

To assist Lead Agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific greenhouse gas emissions (GHG) on global climate change, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has adopted the guidance: *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* and the policy: *District Policy – Addressing GHG Emission Impacts for Stationary Source Projects Under CEQA When Serving as the Lead Agency*. The guidance and policy rely on the use of performance based standards, otherwise known as Best Performance Standards (BPS) to assess significance of project specific greenhouse gas emissions on global climate change during the environmental review process, as required by CEQA. Use of BPS is a method of streamlining the CEQA process of determining significance and is not a required emission reduction measure. Projects implementing BPS would be determined to have a less than cumulatively significant impact. Otherwise, demonstration of a 29 percent reduction in GHG emissions, from business-as-usual, is required to determine that a project would have a less than cumulatively significant impact. The guidance does not limit a lead agency's authority in establishing its own process and guidance for determining significance of project related impacts on global climate change.

Environmental Impacts, Mitigation Measures and Significance After Mitigation

Criteria for Significance

As with any environmental impact, lead agencies must determine what constitutes a significant impact. In the absence of regulatory standards for GHG emissions or other scientific data to clearly define what constitutes a "significant impact", individual lead agencies may undertake a project-by-project analysis, consistent with available guidance and current CEQA practice. The potential effects of a project may be individually limited but cumulatively significant. Lead agencies should not dismiss a proposed project's direct and/or indirect climate change impacts without careful consideration, supported by substantial evidence. Although climate change is ultimately a cumulative impact, not every individual project that emits GHGs must necessarily be found to contribute to a significant cumulative impact on the environment. CEQA authorizes reliance on previously approved plans and mitigation programs that have adequately analyzed and mitigated GHG emissions to a less than significant level as a means to avoid or substantially reduce the cumulative impact of a project, encourages reliance on other Environmental Impact Reports that discuss greenhouse gases, and tiering from them. The preliminary draft amendments OPR issued included an introductory letter in which OPR indicated that it intends to rely on CARB to recommend a method for setting significance thresholds.

As described previously, the State Legislature and the global scientific community have found that global climate change poses significant adverse effects to the environment of California and the entire world. To mitigate these adverse effects the State Legislature enacted AB 32 which requires statewide GHG reductions to 1990 levels by 2020.

AB 32 and S-3-05 target the reduction of statewide emissions. It should be made clear that AB 32 and S-3-05 do not specify that the emissions reductions should be achieved through uniform reduction by geographic location or by emission source characteristics. Consistency with AB 32 will be used to assess significance with respect to greenhouse gas (GHG) emissions.

Methodology

Climate change is a significant global cumulative impact that could also have a substantial effect on the natural environment of California and Fresno County. The potential contribution of the 2011 RTP to this cumulative impact is discussed below.

State action on climate change is mandated by AB 32. Fresno COG, along with other regional planning agencies throughout the State, will be monitoring the progress of State agencies in developing approaches to address GHG emissions. As agreed-upon approaches for project-level CEQA analysis and for transportation planning are established, Fresno COG expects that climate change will be a key environmental consideration in future regional transportation planning. Both Fresno COG and responsible agencies implementing projects outlined in the 2011 RTP will be required to adhere to any future applicable mandatory regulations regarding global warming resulting from the passage of AB 32.

Although the MPOs do not have land use authority to implement more compact and energy efficient land use, or limit growth, the eight San Joaquin Valley Councils of Governments or County Transportation Commissions are working on a significant project called the San Joaquin Valley Blueprint. The process has led to a preferred land use scenario separate from the local government general plan process. The agencies are now working collectively on a Blueprint Implementation Plan including a ToolKit that will be available to local agencies throughout the Valley as they review development projects and prepare land use plans and policies.

The SJVAPCD provides a methodology for addressing Greenhouse Gas Emission for Stationary Sources and for Development projects in *Addressing Greenhouse Gas Emissions under the California Environmental Quality Act*. The methodology relies on the use of performance based standards that would be applicable to projects that result in increased GHG emissions. The SJVAPCD notes that the use of performance based standards is not a method of mitigating emissions, rather it is a method of determining significance of project specific GHG emission impacts using established specifications or project design elements: Best Performance Standards (BPS).

In the SJVAPCD's *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* it states that projects implementing Best Performance Standards in accordance with the guidance would be determined to have a less than significant individual and cumulative impact on global climate change and would not require project specific quantification of GHG emissions. Projects exempt from the requirements of CEQA, and projects complying with an approved GHG emission reduction plan or mitigation program would also be determined to have a less than significant individual or cumulative impact. Projects not implementing BPS would require quantification of project specific GHG emissions. To be determined to have a less than significant individual and cumulative impact on global climate changes, such projects must be determined to have reduced or mitigated GHG emissions by 29%, consistent with GHG emission reduction targets established in ARB's AB 32 Scoping Plan. Furthermore, quantification of GHG emissions would be expected for all projects for which the lead agency has determined that an Environmental Impact Report (EIR) is required, regardless of whether the project incorporates Best Performance Standards.

While this methodology is deemed appropriate for project-level analysis and could apply to the project-level analysis for individual RTP projects as they are designed and reviewed, it is not a methodology for program-level analysis such as done with the 2011 RTP EIR. Instead, the analysis used for the 2011 RTP EIR quantifies GHG emissions associated with the 2011 RTP. The 2011 EIR GHG analysis does not look at GHG emission sources that are non-transportation related (i.e. industrial, commercial, etc.). Neither CEQA nor the CEQA Guidelines mention or provide any methodology for analysis of "greenhouse gases," including CO_2, nor do they provide any significance thresholds. However, the air quality model used to predict emissions rates of the criteria pollutants (EMFAC) is capable of modeling the emissions of CO_2, and Fresno COG analyzed CO_2 emissions and fuel-consumption impacts from on-road travel resulting from the proposed RTP. The county-wide levels of GHGs associated with on-road vehicle travel are estimated based on the population estimates adopted by Fresno COG in 2009. These population estimates were developed considering the economic downturn.

The impact assessment for GHG emissions focuses on potential effects the project (2011 RTP) might have on GHG emissions within the Fresno Region. The assessment is not site or individual improvement project-specific but is a regional analysis.

Impact 3.5.1 - Increased Transportation GHG Emissions May Contribute to Climate Change

The ultimate sources of increased transportation emissions in Fresno County are population and employment growth, which will increase with or without projects referenced in the 2011 RTP. Fresno COG does not implement land use policy in Fresno County; rather, this is under the jurisdiction of the County and the various cities. Decisions about the place, pace, and scale of growth and development are reflected in the general plans and project approvals adopted by the local agencies. The 2011 RTP is designed to complement, rather than change, the plans adopted by the local agencies. Thus, the ultimate effect of the 2011 RTP on transportation emissions is not to increase the amount of travel per se, but rather to influence where and how travel occurs within and through the County.

Fresno COG's ability to address and mitigate climate change impacts is limited primarily to policy and funding decisions related to planned roadway and alternative transportation improvements. As described above, the combustion of fossil fuels during vehicle operations is one of the primary sources of GHG emissions in California. GHG emissions also result from the carbon dioxide, methane, and nitrous oxide that are released during the combustion of gasoline and diesel fuel in construction equipment, vehicles, buses, trucks, and trains; and the use of natural gas to power transit buses and other vehicles. As discussed previously, historical and current global GHG emissions are known by the State and the global scientific community to be causing global climate change, and future increases in GHG emissions associated with the proposed RTP could exacerbate climate change and contribute to the significant adverse environmental effects described previously. Furthermore, increased GHG emissions associated with the proposed RTP could impact implementation of the State's mandatory requirement under AB 32 to reduce statewide GHG emissions to 1990 levels by 2020.

CO2 Emissions

Emissions associated with the 2011 RTP can be divided into two categories: passenger transportation associated with light duty trucks and automobiles (LDTA), and goods movement by truck. Consistency with AB 32 will be evaluated by reviewing the Scoping Plan[1] and evaluating whether the actions in the 2011 RTP will in any way impede implementation of the Scoping Plan. This will be done individually for the LDTA category and the Goods Movement category. The Goods Movement category within the 2011 RTP comprises emissions associated with goods movement in trucks. The Goods Movement category in the Scoping Plan also includes transportation of goods by vessels, but those categories are not impacted by the 2011 RTP.

- Light Duty Trucks and Autos: For LDTA, there are three measures listed in the Scoping Plan. They are:
  1. Low Carbon Fuel Standard (LCFS)
  2. Pavley Greenhouse Gas Vehicle Standards
  3. Regional Transportation-Related GHG Targets

  The 2011 RTP will not impact the implementation of the LCFS and the Pavley fuel efficiency standards. The Regional Transportation-Related GHG targets are implemented by SB 375, which establishes mechanisms for the development of regional targets for reducing LDTA greenhouse gas emissions. Through the SB 375 process, regions will work to integrate development patterns and the transportation network to achieve the reduction of greenhouse gas emissions while meeting housing needs and other regional planning objectives.

[1] http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

SB 375 requires CARB to develop, in consultation with MPOs, passenger vehicle greenhouse gas emissions reduction targets for 2020 and 2035 by September 30, 2010. The first RTP Update that will be subject to SB 375 for Fresno COG is the 2014 RTP. However, Fresno COG has evaluated the 2011 RTP for consistency with the SB 375 draft targets for the purposes of evaluating significance for GHG emissions.

Consistent with the draft SB 375 targets published by CARB, and CEQA practice, the baseline is intended to be representative of today's conditions. Due to the recession that is currently impacting the economy, and, as a result, traffic volumes, the Regional Targets Advisory Committee (RTAC) recommended that the baseline year be set to a year that was representative of conditions before the recession. Accordingly, 2005 was chosen as a baseline year that is representative of conditions today in absence of the economic downturn. That year is used as the baseline in the SB 375 draft targets, and is used in this document.

SB 375 targets for each region were published by the CARB on June 30th, 2010. The Draft GHG target for MPOs within the San Joaquin Valley were set to between 1% and 7% of the GHG emissions relative to 2005 exclusive of emission reductions expected from Pavley GHG Vehicle Standards and the LCFS. CO_2 emissions were projected for 2005, 2020, and 2035 using EMFAC 2007 Version 2.3 model.

TABLE 3-33
Future VMT and GHG Emissions

	Pounds per Capita GHG Emissions	% Change from 2005	VMT Per Capita	% Change from 2005
2005	31.7	--	23.6	--
2020	31.9	0.5%	23.8	1.2%
2035	32.5	1.8%	24.9	5.8%

Source: Fresno COG, EMFAC 2007 Version 2.3 model.

As shown in Table 3-33, the GHG emissions for 2020 and 2035 are between 0.5% (2020) and 1.8% (2035) above the GHG emissions level of 2005, exclusive of the savings expected from the Pavley GHG Vehicle Standards and the LCFS. Table 3-33 also shows that VMT increases on a per capita basis by 1.2% in 2020 and 5.8% in 2035. The increase in 2020 and 2035 is directly correlated to the population growth in the region and increased VMT traveling below 25 mph (the speed range at which GHG emissions production is the highest from light duty autos and trucks). In 2020 and 2035 population growth outpaces transportation improvements resulting in an overall increase in GHG emissions on a per capita basis relative to 2005 in 2020 and 2035 respectively. Year 2020 and 2035 emissions reflect an increase in per capita emissions from 2005 and therefore do not demonstrate consistency with AB 32.

- Goods Movement: The Goods Movement category includes the following measures in the Scoping Plan:
  1. Ship Electrification at Ports
  2. System-Wide Efficiency Improvements
  3. Heavy-Duty Vehicle Greenhouse Gas Emission Reduction (Aerodynamic Efficiency)
  4. Medium- and Heavy-Duty Vehicle Hybridization

Medium Duty and Heavy Duty on road goods movement emissions were quantified using the Fresno COG travel demand model and EMFAC 2007. GHG emissions results for medium and heavy duty trucks can be found in Table 3-34.

TABLE 3-34
GHG Emissions (Goods Movement)
(Tons/Day)

	Medium Duty Trucks	Heavy Duty Trucks	Total Emissions
2005	2,250	5,170	7,420
2020	2,860	6,890	9,750
2035	3,910	8,310	12,220

Sources: Fresno COG, Trimms 2.0 (2010), EMFAC 2007 Version 2.3 model.

Although GHG emissions appear to increase from medium duty and heavy duty trucks, these emissions calculations do not reflect emissions reductions attributable to the Goods Movement Emissions Reduction Plan or non-regulatory reductions achieved from the implementation of the Goods Movement portion of Proposition 1B (2006). While non-regulatory measures and measures not approved at the time of the release of EMFAC 2007 cannot be accurately reflected in the emissions model, implementation of the Goods Movement Emissions Reduction Plan and the 2007 State Implementation Plan will lead to emissions reductions consistent with the AB32 scoping plan for the goods movement sector. The 2011 RTP does not hinder the implementation of these plans, and therefore, emissions reductions are anticipated to be consistent with the goals of AB 32.

It is also important to note that emissions estimates contained within ARB's Goods Movement Emissions Reductions Plan from the goods movement sectors continue to grow in the future. As indicated in the Goods Movement Reductions Plan, regulatory actions are, and will remain the framework for emissions reductions. The 2011 RTP does not interfere with the implementation of ARB regulatory actions.

The Goods Movement Emissions Reduction Plan (required by Proposition 1B) and the 2007 State Implementation Plan contain numerous measures designed to reduce the public health impact of goods movement in California. Currently the San Joaquin Valley Air Pollution Control District has been awarded Prop 1B funding for diesel engine retrofits. Emissions reductions resulting from these projects are outside the scope of the RTP and therefore have not been quantified. Significant reductions however, are not expected.

- Energy Consumption

Vehicle fuel consumption was projected from a baseline year of 2011 through the RTP build out year of 2035 using EMFAC 2007 Version 2.3 model. Table 3-35 quantifies the projected vehicle fuel consumption in gallons per day using EMFAC data. The total fuel consumption is projected to increase from 1,564,990 gallons in 2005 to 2,429,640 gallons in 2035, representing an increase of 55 percent over 30 years. The largest increase is projected in gasoline fuel with a 61 percent increase over 30 years, while diesel consumption is projected to

decrease by 44 percent during the same time. It should be noted that the fuel consumption estimate is an overestimate, as "Pavely and Low Carbon Fuels" will have an impact on fleet efficiency.

TABLE 3-35
Fresno County Vehicle Fuel Consumption (2011 through 2035)

	2011	2025	2035
Gasoline (gallons)	1,042,080	1,386,150	1,679,440
Diesel (gallons)	522,910	671,400	750,200
Total Fuel (gal/day)	1,564,990	2,057,550	2,429,640
Total Fuel per capita (gal/day)	1.548	1.595	1.599

Sources: Fresno COG, EMFAC 2007 Version 2.3 (2010).

The fuel consumption outputs reflect an increasing trend of fuel consumption per capita. This analysis shows that even with implementation of the various multi-modal improvements under the 2011 RTP, including bike/pedestrian facilities, transit infrastructure/service, etc., VMT and fuel consumption will increase. Not reflected in the emission outputs is the potential for GHG benefits as a result of the Fresno COG's Smart Growth incentives and as a result of a Sustainable Communities Strategy that Fresno COG will prepare in accordance with SB 375, with the next RTP update.

- Population Growth

Between 2000 and 2010, Fresno County and its incorporated cities have experienced a wide range of development and population growth. Over the next 25 years, the Fresno region will continue to grow rapidly. Fresno COG projects a total employment of 618,682 for Fresno County by 2035. This will accompany an increase in population in the County of 527,403 persons between 2010 and 2035, an increase of 53 percent over the 25-year period. In 2035, the estimated total population for Fresno County is 1,519,325 persons. Table 3-36 presents the population projections from 2000 through 2035. The population forecast of a local firm, the Central California Futures Institute, was used instead of the forecast of the Department of Finance. In the past couple of decades the DOF has over-projected the population of Fresno County. The CCFI-prepared forecast specifically analyzes Fresno County's economy and its relationship to the state and national economies, in contrast to the DOF's state-focused approach.

TABLE 3-36
Population of Fresno County
1970 - 2035

Date	Fresno County	California	County Share of California Population
April 1970	413,100 [1]	19,053,100 [1]	2.2%
April 1980	514,600 [1]	23,667,900 [1]	2.2%
April 1990	667,500 [1]	29,760,000 [1]	2.2%
April 2000	799,407 [1]	33,871,648 [1]	2.4%
July 2005	888,873 [2]	36,899,392 [2]	2.4%
July 2010	991,922 [2]	39,135,676 [2]	2.5%
July 2015	1,086,843 [3]	41,560,669 [2]	2.6%
July 2020	1,185,766 [3]	44,135,923 [2]	2.7%
July 2025	1,290,481 [3]	46,618,582 [2]	2.8%
July 2030	1,402,727 [3]	49,240,891 [2]	2.8%
July 2035	1,519,325 [3]	51,692,474 [2]	2.9%

Sources: [1] U.S. Bureau of the Census
[2] State of California Department of Finance
[3] Based on Central California Futures Institute forecast

GHG emissions associated with implementation of the proposed RTP are primarily related to a projected increase in Countywide VMT as a result of projected growth in the unincorporated areas of Fresno County and the incorporated cities. As described previously, Fresno COG does not have land use authority within the County or the incorporated Cities. Therefore, Fresno COG's ability to mitigate for climate change impacts in this EIR and the 2011 RTP update is largely limited to Smart Growth Incentives, a focus on the Sustainable Communities Strategy for the 2014 RTP Update, and improvements in alternative modes of transportation that may result in decreases in VMT per capita throughout the County.

- Greenhouse Gas Reduction

Fresno COG has used the best available information to determine whether the proposed RTP is consistent with the State's achievement of the AB 32 GHG emission reductions. In light of the uncertainty in the regulatory and technological environment, the 2011 RTP incorporates all feasible mitigation measures, which are identified below, to reduce the impacts of the proposed project on global climate change. This EIR also includes a requirement that RTP projects incorporate the SJVAPCD's Best Performance Standards for reducing GHG. The RTP has also incorporated numerous policies, action items and funding priorities to develop and improve alternative modes of transportation throughout the County and the incorporated cities in Fresno County.

The measures included in the RTP are consistent with the GHG mitigation approaches outlined by the California Attorney General's Office in the May 21, 2008 report titled: *The California Environmental Quality Act, Addressing Global Warming Impacts at the Local Agency Level: Global Warming Measures.* The mitigation measures

outlined below, and the policies and action items included in the 2011 RTP update are also consistent with the May 29, 2008 Addendum to the 2007 Regional Transportation Guidelines prepared by the California Transportation Commission: *Addressing Climate Change and Greenhouse Gas Emissions During the RTP Process.*

- Fresno County Regional Blueprint Process

Fresno COG and the other seven counties in the San Joaquin Valley have developed individual Blueprints for their counties and have also completed a coordinated effort to develop the San Joaquin Valley Blueprint. All eight counties are located in the same Air Basin (San Joaquin Valley Air Basin) and received the grant for Blueprint development from the State of California. The Blueprint programs in California are designed to address the three "E"s of Regional Blueprint Planning; that is, Energy Efficiency, the Environment, and Economic Development. The Fresno County Regional Blueprint identifies a preferred land use scenario and transportation system for Fresno County considering the application of alternative growth strategies. The Plan also identifies a vision, values, goals, objectives, and implementing strategies that can be planned by Fresno COG and implemented by local agencies within the County to reduce vehicle trips, vehicle miles traveled (VMT), and support increased walkability, passenger rail, public transit systems, and bicycling.

The primary purpose of Fresno County Regional Blueprint is to establish a coordinated long-range (year 2050) regional vision between transportation, land use, and the environment from an overall quality of life perspective.

As a vision, the Blueprint recognizes that economic, environmental, and social issues are interdependent and only integrated approaches will effect needed changes. The location of jobs, housing, and commerce affects the transportation system, the nature of the transportation system affects air quality, and air quality affects health outcomes.

Below are the three key products developed during the Blueprint process:

Guiding Principles: The San Joaquin Valley Blueprint Smart Growth Principles were developed based, primarily, on citizen-identified visions, values, and aspirations for Fresno County and other counties throughout the Valley from the Phase I workshops. In turn, the Blueprint Smart Growth Principles provided the foundation upon which the Phase II Blueprint Vision choices were built.

The adopted 12 Smart Growth Principles are:

1. Create a range of housing opportunities and choices
2. Create walkable neighborhoods
3. Encourage community and stakeholder collaboration
4. Foster distinctive, attractive communities with a strong sense of place
5. Make development decisions predictable, fair, and cost-effective
6. Mix land uses
7. Preserve open space, farmland, natural beauty, and critical environmental areas
8. Provide a variety of transportation choices
9. Strengthen and direct development towards existing communities
10. Take advantage of compact building design
11. Enhance the economic vitality of the region
12. Support actions that encourage environmental resource management

Preferred 2050 Regional Blueprint Scenario

The Fresno Regional Blueprint vision, values and guiding principles include the following: In the future, Fresno County and its cities will be composed of unique cities and communities supported by a competitive economy, a well-educated work force, and a protected environment. The County communities will focus on cultural and community stewardship, where the community takes ownership of its problems and solutions. The values and guiding principles support the main ideas in the vision statement. Fresno County communities value environmental health and sustainability, a vibrant economy, public safety, world class education, transportation options, housing choices, the worth of all people, aesthetic quality, cultural richness, and positive image of the communities. Fresno County has guiding principles that encourage community and stakeholder collaboration, foster communities with a strong sense of place, make development decisions predictable, provide transportation and housing options, take advantage of compact building design, create walkable neighborhoods, mix land uses, preserve open space and farmland, and direct development towards existing communities.

The Fresno COG preferred growth scenario is referred to as the "Hybrid" concept because it is based on elements of several alternative growth scenarios originally developed by the Fresno COG Blueprint Roundtable. The Hybrid concept includes a high-capacity, multi-modal transportation network that provides connectivity throughout the region. It involves a mix of infill development, greenfield development, and redevelopment. One of the principal objectives of the preferred growth scenario is to provide for employment centers to serve the west side of Fresno County, either along the I-5 corridor or in other appropriate locations. The preferred growth scenario also discourages growth on strategic farmland and resource conservation/open space land. By linking east-west transportation corridors to I-5 and balancing jobs and housing, the preferred growth scenario predicts lower VMT than the status quo scenario. The Fresno COG preferred growth scenario estimates that by 2050, countywide average residential densities for new residential growth will be 8.0 dwelling units per acre. The density of new growth in the Fresno-Clovis Metropolitan Areas (FCMA) will be slightly higher, while the average density of new growth in the non-FCMA areas will be lower.

The next step is for the eight counties to coordinate development of a Blueprint Implementation Plan. The purpose of the Plan is to create a detailed document that will act as a guide to direct Blueprint implementation in the Valley. The Implementation Plan will detail current Valleywide goals and objectives, provide implementation actions to address the twelve Smart Growth Principles, and provide recommendations for the future. The intent of the Implementation Plan is to facilitate better tools for decision making by assisting local governments, tracking progress, and providing information to update local general plans.

- ### Existing Transit Systems in Fresno County

Fresno COG, working closely with local and regional bus and rail transit operators, continues to improve public transportation across Fresno County. Funding for transit operations come primarily from Federal Transit Administration (FTA) grant programs, State Transportation Development Act (TDA), State Transit Assistance, and Measure "C".

Transit operations in Fresno County include:

- Fresno Area Express
- Fresno Handy Ride
- Clovis Round-Up
- Fresno County Rural Transit Agency
- Amtrak
- Greyhound
- Orange Belt Stagelines

- Transportes Intercalifornias

Measure "C" has provided local jurisdictions with additional local funds to be used for local transportation purposes. However, in the past those funds have not been dedicated to transit and are also balanced against the local street needs of the various jurisdictions. This is evidenced by the fact that FAX did not receive any Measure "C" funding in its operating budgets for fiscal years 1998, 2000, and 2001. With the passage of the Measure "C" Extension in November 2006, over 24% of the funds generated by the ½ cent sales tax are dedicated for transit purposes. This funding is currently estimated to be $235 million dollars over the next 20 years for FAX alone. The Measure "C" Extension also included a number of rural transit improvements to be implemented over the next twenty years.

Public transit has been enhanced in the 2011 RTP compared to the current RTP (adopted in 2007). Such improvements will help mitigate expected increases in emissions resulting from increased population and employment and the impact of planned growth and development on the regional transportation system. The project improvements are expected to reduce VMT and vehicle trips, and as a result, GHG emissions.

Fresno County has made significant progress in addressing many public transit needs throughout the Region. Fresno COG's "Unmet Transit Needs" process has determined that transit services within the Fresno County are meeting the reasonable transit needs of the public. These transit systems provide vital transportation services and enhancing the overall quality of life for residents throughout the County. Planned transit improvements over the 25 year timeframe of the RTP will be funded with approximately $897 million in projected revenues dedicated to future public transit improvements and services.

- Action Plans Intended to Reduce GHG

The RTP includes numerous action plans that are intended to promote the use of public transportation, rail, and non-motorized systems. Chapter 4, Action Element provides numerous tables that show the planned facilities under each of these alternative modes. This includes approximately $897 million available to Transit, and approximately $250 million available to other modes including non-motorized (bicycle and pedestrian), alternative-fuel vehicle projects, and others. Another $20 million in Measure "C" funding is dedicated to providing incentives for transit oriented infrastructure for in-fill developments.

- SJVAPCD Best Performance Standards (BPS)

The SJVAPCD published *Guidance for Valley Land-use Agencies in Addressing GHG Emission Impacts for New Projects under CEQA* in December 2009. This guidance document defines Best Performance Standards (BPS) as the most effective achieved in-practice means of reducing or limiting GHG emissions from a GHG emissions source. The document includes BPSs for both traditional stationary source projects, and development projects. For stationary sources, BPSs includes equipment type, equipment design, and operational and maintenance practices for the identified service, operation, or emissions unit class and category. For development projects, BPS focuses on measures that improve energy efficiency and those that reduce vehicle miles traveled.

Mitigation Measures

Both Fresno COG and responsible agencies implementing projects outlined in the 2011 RTP will be required to adhere to any future applicable mandatory regulations regarding global warming resulting from the passage of AB 32 and AB 1493, but the exact character of such future implementing strategies is not known at this time. Fresno COG and the local agencies will quantify GHG emissions consistent with Guidelines and requirements developed by CARB.

The following mitigation measures are intended to address regional and project-level impacts, as appropriate. For project-level impacts, the individual improvement project proponent or local jurisdiction will be responsible for ensuring adherence to the mitigation measures. In addition, a number of mitigation measures are included in Section 3.3 of the Draft SEIR to address criteria emissions.

- Through Implementation of the Regional Blueprint and coordination with implementation agencies, the following mitigation measures will result in reduced GHG emissions:
  - Develop land use patterns, which encourage people to walk, bicycle, or use public transit for a significant number of their daily trips
    - Use comprehensive community plans and specific plans to ensure development is consistent and well connected by alternative transportation modes
    - Adopt transit-oriented or pedestrian-oriented design strategies and select areas appropriate for these designs in the general plan
    - Support higher density development in proximity to commonly used services and transportation facilities
  - Develop in a compact, efficient form to reduce vehicle miles traveled and to improve the efficiency of alternatives to the automobile
    - Use the control of public services to direct development to the most appropriate locations
    - Promote infill of vacant land and redevelopment sites
  - Encourage project site designs and subdivision street and lot designs that support walking, bicycling, and transit use
    - Adopt design guidelines and standards promoting plans that encourage alternative transportation modes
    - Require certain sites to be created to allow convenient access by transit, bicycle, and walking

- Intelligent Transportation
  - Develop an Intelligent Transportation Systems strategy, consistent with the adopted ITS Strategic Plan, to implement the Integrated Performance Management System Network that will:
    - Interconnect the region's local transportation management centers, including the use of cameras, and computer hardware and software to detect and clear accidents
    - Use technology to improve traffic signal timing in order to optimize traffic flow and transit service
    - Involve new equipment to improve on-time transit performance and provide real-time transit information at stops and stations

- Create Alternative Fuel Vehicle and Infrastructure Toolkit for Local Governments

  Fresno COG will develop an Alternative Fuel Vehicle (AFV) and Infrastructure Toolkit as part of the Blueprint implementation process for member agencies that will contain best practices related to ordinances, analytical tools, financing opportunities, codes, and standards related to reducing GHG emissions. Fresno COG will identify the alternative fuel vehicle(s) (e.g. neighborhood electric vehicles) and alternative fuel infrastructure with the potential to result in the greatest GHG emission reductions. Fresno COG will conduct a public education program for local governments and other public agencies, as appropriate to encourage the use of alternative fuel vehicles and infrastructure.

  Fresno COG will work with its member agencies to increase the number of AFVs (i.e., vehicles not powered strictly by gasoline or diesel fuel) both in municipally owned vehicles, as well as those owned by franchisees of these cities, such as trash haulers, green waste haulers, street sweepers, and curbside recyclable haulers.

Such AFVs shall have GHG emissions at least 10 percent lower than comparable gasoline- or diesel-powered vehicles. The Alternative Fuel Vehicle and Infrastructure Toolkit described above will include best practices strategies to aid in the transformation of municipally owned or contracted fleets, including vehicle fleets operated and/or funded, at least in part by Fresno COG.

- Continue the Public Education Program on Individual Transportation Behavior and Climate Change

  In conjunction with key partners such as local air districts, public utility providers, area chambers of commerce and others, Fresno COG will continue the public information program to educate the public about the connection between individual transportation behavior and global climate change, including transportation behavior modifications the public can make to reduce their GHG emissions over time. Fresno COG shall include information on its website that is focused on global climate change. The website shall identify actions the public can take to reduce their carbon footprint, and provide web links to sources of information designed to promote alternative mode use (carpools, vanpools, public transit, bicycling, walking, telecommuting) and other travel demand management strategies.

- Provide Funding for Workshop on Global Climate Change for Local Government Officials and Include in the Blueprint Toolkit

  Fresno COG will provide funding for a workshop on global climate change for local government officials that will focus on practical techniques that local governments can implement to reduce greenhouse gas emissions at the city and county level. Workshop topics shall include, but are not limited to the following:

  - The basic science behind climate change and its effects on the Fresno County Region
  - Addressing the California Environmental Quality Act (CEQA) and the effects of AB 32
  - What cities and counties are doing to address climate change and CEQA
  - Cost effective actions cities can take to reduce greenhouse emissions
  - Actions being taken in the Fresno County area to advance and support innovative "green" business

  Fresno COG, in conjunction with other key partners, shall produce a toolkit (as part of the Blueprint implementation process) for local governments to use to take effective action to reduce greenhouse gas emissions over time. The toolkit will incorporate recommendations by the workshop participants to identify which issues are important for the region and the tools and resources they would like to have available to reduce greenhouse emissions .

- Continue to implement the Safe Routes to School program and conduct a workshop with cities, the county and school districts to identify other opportunities for collaboration that may reduce GHG emissions.

- Continue to Work with Member Agencies Regarding the Safe Routes to School (SRTS) Policy and Program and Conduct Workshop with Cities, the County, and School Districts to identify other opportunities for collaboration that may reduce GHG emissions.

  Continue to work with local agencies on development of Safe Routes to Schools (SRTS) policies and programs to promote the practice of safe bicycling and walking to and from schools throughout the region in order to reduce traffic congestion, improve air quality, and enhance neighborhood safety. There are both federal and state funding programs for SRTS. As a regional agency, Fresno COG is an eligible applicant under the federal program for both infrastructure and non-infrastructure projects. Under the state program, only cities and counties are eligible applicants for infrastructure projects only. (Caltrans, 2007). With the passage of the SRTS bill (AB

1475), a "one-third" distribution formula for federal safety funds (to be allocated in equal amounts to: state highways, local roads, and SRTS construction programs) was established.

The federal SRTS was authorized by Section 1404 of the *SAFETEA-LU (the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users*). The State-legislated SRTS program (SR2S) is contained in Streets & Highways Code Section 2330-2334. Fresno COG shall continue to encourage its member agencies to apply for funds available through the State Highway Safety Improvement fund for eligible infrastructure projects in order to improve bicycle and pedestrian safety for school children.

In addition, Fresno COG will host a regional workshop as part of its Transportation Forum or series of SCS workshops, for all cities, the County, school districts and transit operators within the region to identify other potential opportunities for collaboration that would reduce GHG impacts. At a minimum, the issues discussed should include the findings from the SRTS activities described above, opportunities to increase the number of students with bus or other transit options to get to and from school, and integrating school siting practices with goals of promoting walkable neighborhoods with a wide range of easily accessible services.

- Report on Fresno COG's own GHG Impacts

  Fresno COG should report on its own GHG emissions and track its progress in reducing GHG emissions.

- Project level environmental documents shall analyze construction and maintenance project Greenhouse Gas (GHG) emissions

- Develop a Sustainable Communities Strategy (SCS) in compliance with SB 375 prior to the adoption of the next RTP

  1. Within one year from adoption of the next RTP, Fresno COG will undertake the following: Fresno COG will work with the local jurisdictions and transit operators within Fresno County to develop countywide land use scenarios that reflect different population distributions and land use (mix and density), and multimodal transportation strategies, utilizing the Fresno COG regional travel demand model in coordination with a rapid fire tool similar to I-Places. Scenarios will be developed to identify the alternatives that demonstrate potential reductions in vehicle miles traveled (VMT) and total vehicle miles; GHG, conventional and toxic air pollutant emissions; long distance commute trips; and other such factors discussed in the RTP and EIR as the COG Board thinks advisable consistent with state and federal law.

     Coordination with local agencies currently in the development process of local climate action plans or general plan updates are important for consistency purposes. The schedule identified to develop alternative scenarios should be flexible to allow incorporation of these planning efforts into the regional scenario development effort.

     Public participation in this process is important to Fresno COG and will be incorporated into the scenario development process identified above.

  2. Upon completion of the scenario development exercise above, Fresno COG will use the data from this exercise as well as public input to develop a multimodal transportation strategy that when combined with land use demonstrates the most potential to meet the following goals: reductions in vehicle miles traveled (VMT) and total vehicle miles; GHG, conventional and toxic air pollutant emissions; long distance commute trips; and other such factors discussed in the RTP and EIR as the COG Board thinks advisable consistent

with state and federal law. This strategy may be one of the scenarios developed in 1 above or may be a hybrid scenario.

3. The resulting multimodal transportation strategy from 2 above will be presented to the Fresno COG Board in 2013 as an update to the 2011 RTP, for approval or disapproval by the Board, subject to all applicable federal and state laws.

Significance After Mitigation

Fresno County is estimated to grow in population by an estimated 527,403 persons between 2010 and 2035. Fresno COG has used the best available information to determine whether the 2011 RTP is consistent with the State's achievement of the AB 32 GHG emission reductions. Implementation of the mitigation measures described above will assist in the reduction of per capita VMT levels throughout Fresno County, which will assist in meeting the stated goals of AB 32. The 2011 RTP has included numerous projects, action items, funding priorities, and programs to develop and improve alternative modes of transportation throughout the County and Fresno COG continues to coordinate with local land use agencies to assist in the development of plans and policies aimed at reducing VMT.

Fresno COG responds to congestion through the investment in roadway capacity increasing measures once all reasonable non-capacity measures have been employed. The 2011 RTP includes approximately $897 million available to Transit, and $270 million available to other modes including non-motorized (bicycle and pedestrian), alternative-fuel vehicle projects, transit oriented infrastructure for in-fill developments, and others.

The Fresno County Regional Blueprint has been prepared to establish a coordinated long-range (year 2050) regional vision between transportation, land use, and the environment from an overall quality of life perspective. The completion of the Regional Blueprint serves as a starting point for Fresno COG as they begin development of a Sustainable Communities Strategy in accordance with the requirements of SB 375. In developing the Sustainable Communities Strategy, Fresno COG will consider the Blueprint Regional Vision Statement, the Blueprint Guiding Principles, and the Blueprint Performance Measures & Indicators (PMIs) that were developed for the Regional Blueprint. In addition, they will utilize the best available tools and techniques to develop a strategy that contributes to the State's achievement of the AB 32 GHG emission reductions.

Mitigation measures are presented above that will reduce GHG emissions to the extent feasible considering requirements set forth in AB 32. Such measures will also assist in the promotion and implementation of Smart Growth and sustainable planning practices by the cities and the County. While such feasible mitigation measures will reduce GHG impacts, fuel consumption, goods movement GHG emissions, and on-road GHG emissions are estimated to increase on a per capita basis between 2005 and 2035. Even though all feasible mitigation measures have been identified to reduce the level of impact, impacts ***cannot be mitigated to a less than significant level***.

ATTACHMENT C

3.10 LAND USE & PLANNING

This section of the EIR contains an overview of land use regulations in Fresno County. It also discusses existing land uses and potential impacts that may result from implementation of the Project. City and county governments provide the most direct regulation of land use and development in the County, but federal and state levels of government also participate in land use regulation and planning for the County. The following paragraphs provide definitions of relevant land use regulations.

Regulatory

Federal Regulations

- National Environmental Policy Act (NEPA)

  The National Environmental Policy Act (NEPA) provides general information on effects of federally funded projects. The act was implemented by regulations included in the Code of Federal Regulations (40CFR6). The code requires careful consideration concerning environmental impacts of federal actions or plans, including projects that receive federal funds. The regulations address impacts on land uses and conflicts with state, regional, or local plans and policies, among others. They also require that projects requiring NEPA review seek to avoid or minimize adverse effects of proposed actions, and also to restore and enhance environmental quality, as much as possible.

Federal Agencies

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- U.S. Bureau of Land Management (BLM)

  The U.S. Bureau of Land Management (BLM) manages large rural land areas, including land that is environmentally sensitive. The BLM governs uses that are allowed on land that it manages, striving to balance environmental protection and conservation goals with other uses, such as recreation and grazing.

- U.S. Forest Service (USFS)

  The U.S. Forest Service (USFS) is responsible for the management and conservation of large areas of National Forest land. National forests are primarily managed for outdoor recreation uses (such as camping, hiking, fishing, hunting, skiing, and nature interpretation, among others) and for resource preservation by the USFS.

- U.S. Fish and Wildlife Service (USFWS)

  The U.S. Fish and Wildlife Service (USFWS) administer the Federal Endangered Species Act (FESA), which designates critical habitat for endangered species. This enables USFWS to carry out its mission to conserve, protect, and enhance the nation's fish and wildlife and their habitats for the continuing benefit of people. Critical habitat areas cannot be disturbed without permission from the USFWS and other federal agencies, depending on land ownership. The USFWS also manages a system of land and waters for the conservation of wildlife and associated ecosystems. These National Wildlife Refuges are primarily managed for the preservation and protection of unique or important resources and ecosystems.

- U.S. Army Corps of Engineers (COE)

  The U.S. Army Corps of Engineers (Corps) is responsible for administration of Section 404 of the Clean Water Act (CWA), which governs specified activities in waters of the United States, including wetlands. In this role, the Corps requires that permits be obtained for projects whose plans would place structures, including dredged or filled materials, within navigable waters or wetlands, or result in alteration of such areas.

- U.S. Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS)

  The Natural Resources Conservation Service (NRCS) maps soils and farmland uses to provide comprehensive information necessary for understanding, managing, conserving and sustaining the nation's limited soil resources. One of the NRCS' responsibilities is to manage the Farmland Protection Program, which provides funds to aid in the purchase of development rights to keep productive farmland in agricultural uses. Working through existing programs, USDA joins with state, tribal, and local governments, as necessary, to acquire conservation easements or other interests from landowners.

State Regulations

- California Environmental Quality Act (CEQA)

  CEQA defines a significant impact on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the Project. Land use is a required impact assessment category under CEQA. CEQA documents generally evaluate land use in terms of compatibility with the existing land uses and consistency with local general plans and other local land use controls (zoning, specific plans, etc).

State Agencies

- California Department of Transportation (Caltrans)

  Caltrans' jurisdiction includes the rights-of-way associated with state and interstate routes within California. Any work performed within a federal or state transportation corridor is subject to Caltrans regulations governing allowable actions and modifications to the right-of-way. Caltrans issues encroachment permits on land within their jurisdiction to ensure encroachment is compatible with the primary uses of the State Highway System, to ensure safety, and to protect the State's investment in the highway facility. The encroachment permit requirement applies to persons, corporations, cities, counties, utilities, and other government agencies.

- California Department of Forestry and Fire Protection (CDF)

  The California Department of Forestry and Fire Protection (CDF) reviews and approves plans for timber harvesting on private lands. In addition, the CDF plays a role in planning development in forested areas as a part of its responsibility for fighting wild land fires.

- California Department of Parks and Recreation (CDPR)

  The principal mission of the California Department of Parks and Recreation (CDPR) is to provide sites for a variety of recreational and outdoor activities to California residents and tourists. Natural resource management and protection is also a part of the mission of CDPR. Different park designations dictate the extent to which natural resources are a management priority; natural preserves, state parks, state reserves and state wilderness designations are terms, which indicate that an area has outstanding natural features. The California Department of Parks and Recreation is a trustee agency that owns and operates all state parks and participates in land use planning affecting state parkland.

- California Department of Conservation

  In 1975, the Natural Resources Conservation Service began production of agricultural resource maps based on soil quality and land use. In 1982, the State of California created the Farmland Mapping and Monitoring Program within the California Department of Conservation to carry on the mapping activity from the NRCS on a continuing basis. The California Department of Conservation also administers the Williamson Act for the conservation of farmland and other resource-oriented laws. The Williamson Act is designed to preserve agricultural and open space lands by discouraging their premature and unnecessary conversion to urban uses. Williamson Act contracts, also known as agricultural preserves, offer tax incentives for agricultural land preservation by ensuring that land will be assessed for its agricultural productivity rather than its highest and best uses.

- State Lands Commission

  According to the State Lands Commission (SLC), when California was admitted to the Union, it acquired approximately 4 million acres of sovereign land underlying the State's navigable waterways, including the waters and underlying beds of rivers, lakes, streams, and sloughs. The SLC holds the lands subject to the Public Trust for commerce, navigation, fisheries, and open space preservation. The SLC has developed a list of State-owned and State Public Trust lands in Fresno County. This list is incorporated by reference.

- California Department of Fish and Game (CDFG)

  The California Department of Fish and Game (CDFG) is mandated to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public. In particular, CDFG is required under the California Endangered Species Act, the California Native Plant Protection Act, the California Environmental Quality Act and the Natural Community Conservation Planning Act to conserve species through listing, habitat acquisition and protection, review of local land use planning, multi-species conservation planning, stewardship, recovery, research, and education. The CDFG protects rare, threatened and endangered species by managing habitats in legally designated ecological preserves or wildlife areas.

Local Controls

- Local Agency Formation Commissions

Under state law, each county must have a local agency formation commission (LAFCO). A LAFCO is the agency that carries responsibility for creating orderly local government boundaries, with the goal of encouraging "planned, well-ordered, efficient urban development patterns," the preservation of open space lands, and the discouragement of urban sprawl. A LAFCO typically consists of two county supervisors, two representatives of the county's cities, and one member of the public. Many LAFCOs also include one special district representative. While LAFCOs have no land use power, their actions determine which local government will be responsible for planning new areas.

LAFCOs address a wide range of boundary actions, including creation of spheres of influence for cities, adjustments to boundaries of special districts, annexations, incorporations, detachments of areas from cities, and dissolutions of cities. The definition of a city's sphere of influence is frequently an indication of the city's ultimate boundaries. Since 1992, state law requires that incorporation of a new city must not financially harm the county and must result in a positive cash flow for the new city, a requirement that has slowed the rate of new city incorporation.

- Local Control Mechanisms

General Plans: The most comprehensive land use planning for the County is provided by city and county general plans, which local governments are required by state law to prepare as a guide for future development. The general plan contains goals and policies concerning topics that are mandated by state law and others, which the jurisdiction may have chosen to include. Required topics are land use, circulation, housing, conservation, open space, noise, and safety. Local governments frequently choose to address other topics, including public facilities, parks and recreation, community design, and growth management, among others. City and county general plans must be consistent with each other and County general plans must cover areas not included by city general plans (e.g., unincorporated areas).

Specific and Master Plans: Specific or Master Plans are sometimes developed by a city or county to address smaller, more specific areas within its jurisdiction. These more localized plans provide for focused guidance for developing a specific area and contain development standards tailored to the area, as well as systematic implementation of the general plan.

Zoning: The zoning code for a city or county is a set of detailed requirements that implement the general plan policies at the level of the individual parcel. The zoning code presents standards for different uses and identifies uses that are allowed in the various zoning districts of the jurisdiction. Since 1971, state law has required the city or county zoning code to be consistent with the jurisdiction's general plan.

Environmental Setting

Existing Land Use Within the Region

Land uses throughout the region, as adopted by local cities and counties, are depicted in the various General Plan Land Use Maps prepared, adopted, and on file with the cities and the County and incorporated by reference.

- Residential Land Use

  Fresno County includes the Cities of Fresno and Clovis in addition to several smaller communities. As one moves away from urban centers, parcel sizes tend to become larger and more dependent upon livestock and agriculture. Urban residential zones are typically located within the incorporated cities and allow small lots and relatively high densities.

  The largest residential category within the County is rural residential. This category permits one dwelling unit on parcels ranging from one (1) acre to over 20 acres.

- Commercial Land Use

  Commercial zoning categories also represent an important land use classification within the County. Commercial zoning is typically found in the urban centers and in suburban developments near large residential concentrations in order to allow for the provision of goods and services.

- Industrial/Special Classifications

  Remaining areas of the County are zoned for industry, agriculture, open space, and other special uses. A majority of the land in the eastern portion of the County is under the jurisdiction of the State and federal government.

- Unincorporated Areas

  Unincorporated areas of the County contain a population of approximately 176,350 persons, or 22 percent of Fresno County's total population. In addition to large State and federally owned areas, a number of unincorporated communities are located in Fresno County. These communities, as well as other unincorporated areas are governed by the Fresno County General Plan adopted in 2000.

Regulatory Framework

Land uses within each city and the County are governed by general plans, which designate appropriate land uses throughout the jurisdiction and define specific goals, policies and objectives. In general, most plans recognize existing land uses and determine acceptable uses for future development of land currently used for agriculture or open space.

General plans consist of a number of elements, including land use, circulation, housing, conservation, open space, noise, and safety. The general plan must be comprehensive and internally consistent. Of particular importance is the consistency between the circulation and land use elements. The general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, and other public utilities and facilities must be consistent with the general distribution and intensity of land for housing, business, industry, open space, education, public areas, waste disposal facilities, agriculture, and other public and private uses.

Airport Land Use Commission

In each county containing a public use airport, an Airport Land Use Commission (ALUC) is required to assist local agencies in ensuring compatible land uses in the vicinity of existing or proposed airports; to coordinate planning at state, regional and local levels; to prepare and adopt an airport land use plan as required by Public Resources Code Section 21675; to review plans, regulations or locations of agencies and airport operators; and to review and make recommendations regarding the land uses, building heights, and other issues relating to air navigation safety and promotion of air commerce.

The County of Fresno is designated as the agency responsible for carrying out functions of the Fresno County Airport Land Use Commission. The Commission's Airport Land Use Policy Plan and provides the criteria for evaluating land use compatibility between proposed development in the vicinity of the County's public-use, general aviation airport facilities. There are a total of nine airports affected, in the cities of Fresno, Firebaugh, Mendota, Coalinga, Reedley, and Harris Ranch.

Future Land Use

The future pattern of land uses will remain relatively constant at a countywide level. While urbanized areas will continue to increase in size, the number of acres utilized for development to accommodate the projected population increase is comparatively small. The cities of Fresno and Clovis will remain the predominant urban centers in Fresno County, with the other communities in the County representing a second tier of urban land use. The County's basic land use policy encourages the concentration of urban development in existing cities and infill of vacant land in urban areas to protect agricultural land.

Methodology

Those uses most likely to be affected by the construction and implementation of transportation and related projects are the focus of this land use analysis. Land use impacts are evaluated by identifying the particular type of land use that could be affected by the projects. Because of the comprehensive land use planning information available in them, the general plans for cities and counties were used to identify projected land uses.

Information contained in the general plans of cities and counties were the basis of the evaluation of potential impacts to agricultural and open space areas within the region. In addition to these resources, information from the California Department of Conservation was used to identify potential impacts to agricultural areas.

Environmental Impacts, Mitigation Measures, and Significance After Mitigation

Criteria for Significance

In order to determine potentially significant land use impacts resulting from the RTP, the following significance criteria were used. The RTP projects would produce significant adverse land use impacts if the following circumstances occurred:

- Substantial loss of agricultural, open space, or other resource land.
- Inconsistency with applicable adopted land use plans and policies.
- Incompatibility with adjacent land uses, including impacts to sensitive receptors.
- Physically divide an established community.

Impact 3.10.1 – Land Use Impacts

Strategies aimed at addressing the transportation needs of future growth patterns were considered during development of the proposed RTP. The document promotes alternatives to the automobile such as transit and other alternative modes of transportation such as bicycle facilities, trails, airport improvements, and others. Implementation of strategies proposed in the RTP could result in positive changes to land uses. This would be considered a beneficial impact.

Implementation of transit improvements included in the Plan could influence land use patterns throughout the region. Land use and transportation policies are emphasized in the RTP in order to address automobile traffic and air quality concerns. Growth patterns that promote alternatives to the automobile by creating mixed-use developments, which would include residences, shops, parks, and civic institutions, linked to pedestrian-and-bicycle friendly public transportation centers, are also discussed in the RTP and a separate program has been included in the RTP to develop Transit Oriented Infrastructure for In-Fill Development (TOD). The program will establish transportation facilities in new or revitalized developments to increase transit use and encourage higher density and mixed land use planning. This program will utilize approximately $20 million to facilitate public incentives for alternative transportation practices. Design features, such as improved street connectivity, public amenities, and a concentration of residences and jobs in proximity to transit routes could be incorporated into mixed-use developments; therefore, addressing automobile traffic and air quality concerns. Implementation of enhanced alternative modes as provided by the RTP could result in more balanced land use conditions throughout the region, as the mixed-use developments would result in a concentration of jobs and residences in close proximity to one another.

While the RTP is likely to result in a positive outcome related to supportive land use conditions for alternative forms of transportation such as transit, other projects in the RTP could have significant impacts on land use patterns, potentially causing land use growth and development to occur in areas not previously envisioned for growth and development. This impact could be especially significant on agricultural land uses within the County.

Mitigation Measures

The impact on significant agricultural resources will be evaluated as part of the appropriate improvement project-specific environmental review. Mitigation measures will be identified to minimize impacts. Implementation agencies will be responsible for ensuring adherence to the mitigation measures prior to construction. Fresno COG will be provided with documentation indicating compliance with all mitigation measures.

- Individual projects will be consistent with local land use plans and policies that designate areas for urban land use and preserve agricultural lands that support the economic viability of agricultural activities.

- Prior to final approval of each individual improvement project, the implementing agency will conduct the appropriate project-specific environmental review, including consideration of potential land use impacts.

- Develop a Sustainable Communities Strategy (SCS) in compliance with SB 375 prior to the adoption of the next RTP

  1. Within one year from adoption of the next RTP, Fresno COG will undertake the following: Fresno COG will work with the local jurisdictions and transit operators within Fresno County to develop countywide land use scenarios that reflect different population distributions and land use (mix and density), and multimodal transportation strategies, utilizing the Fresno COG regional travel demand model in coordination with a rapid fire tool similar to I-Places. Scenarios will be developed to identify the alternatives that demonstrate potential reductions in vehicle miles traveled (VMT) and total vehicle miles; GHG, conventional and toxic air pollutant emissions; long distance commute trips; and other such factors discussed in the RTP and EIR as the COG Board thinks advisable consistent with state and federal law.

Coordination with local agencies currently in the development process of local climate action plans or general plan updates are important for consistency purposes. The schedule identified to develop alternative scenarios should be flexible to allow incorporation of these planning efforts into the regional scenario development effort.

Public participation in this process is important to Fresno COG and will be incorporated into the scenario development process identified above.

2. Upon completion of the scenario development exercise above, Fresno COG will use the data from this exercise as well as public input to develop a multimodal transportation strategy that when combined with land use demonstrates the most potential to meet the following goals: reductions in vehicle miles traveled (VMT) and total vehicle miles; GHG, conventional and toxic air pollutant emissions; long distance commute trips; and other such factors discussed in the RTP and EIR as the COG Board thinks advisable consistent with state and federal law. This strategy may be one of the scenarios developed in 1 above or may be a hybrid scenario.

3. The resulting multimodal transportation strategy from 2 above will be presented to the Fresno COG Board in 2013 as an update to the 2011 RTP, for approval or disapproval by the Board, subject to all applicable federal and state laws.

Significance After Mitigation

While implementation and monitoring of the above mitigation measures will provide the framework and direction for subsequent project-specific mitigation designed to avoid or reduce the identified significant Project impacts, it is probable that such impacts will remain significant and unavoidable.

Impact 3.10.2 – Impacts on Sensitive Receptors

There are many sensitive receptors (residences, educational facilities, medical facilities, and places of worship) located in the urban and rural areas of the County. These receptors may be sensitive to noise, vibration, air pollutants, and other conditions that impact our environment. Sensitive receptors located in the vicinities of proposed improvement projects could be impacted by construction and implementation of the proposed highway, arterial and transit projects due to noise, dust, vibration, etc. This would be considered a potentially significant impact.

Construction of new parkways and connectors, widening of existing highways and the construction of new interchanges are some of the highway and arterial projects. However, many other types of transportation projects would not involve construction activities. Many proposed public transit projects involve service alterations along existing streets, highways, and rail lines. These possible impacts would depend on several factors such as the type of Proposed for the area, projected land use designation of the area, and duration of proposed construction activities.

Generally, proposed projects are of the following two types:

- *New Systems* (new highway and transit facilities).
- *Modifications to Existing Systems* (widening roads, addition of carpool lanes, grade crossings, intelligent transportation systems, maintenance, and service alterations).

Mitigation Measures

Impacts to sensitive receptors will be evaluated as part of the appropriate project-specific environmental review, and mitigation measures will be identified to minimize impacts. Implementation agencies will be responsible for ensuring adherence to the mitigation measures prior to construction. Fresno COG will be provided with documentation indicating compliance with all mitigation measures.

- Prior to commencing construction activities on individual projects, project implementation agencies will comply with applicable federal, state and applicable city and county land use plans, policies, and regulations.
- Prior to commencing construction activities with individual projects, project implementation agencies will obtain necessary local permits and meet conditions for approval from applicable cities and counties.
- Prior to final approval of each individual improvement project, the implementing agency will conduct the appropriate project-specific environmental review, including consideration of potential land use impacts.
- Potential significant impacts to land uses will be mitigated.

Significance After Mitigation

This impact would remain significant and unavoidable because of the large number of individual projects that may potentially affect sensitive receptors.

Impact 3.10.3 – Loss of Open Space and Community Recreation Areas

Construction and implementation of projects would result in the loss of open space and community recreation areas. This would be considered a potentially significant impact. Pockets of open space vary in size and location throughout the County and within the cities. Open space land uses include agricultural areas, public parks, recreational facilities, and areas planned for such uses.

The Project includes highway, arterial and transit projects proposed to be located in or adjacent to areas designated for open space. The potential for significant impacts to natural habitats and community recreation exists, since these projects may be constructed in areas that have habitat and recreational value. Development of RTP projects and programs could result in the disturbance or loss of open space and recreational resources. Specifically, new projects involving construction would be most likely to result in impacts to open space areas.

Mitigation Measures

The impact on open space and community recreation areas will be evaluated as part of the appropriate project-specific environmental review and mitigation measures will be identified to minimize impacts. Implementation agencies will be responsible for ensuring adherence to the mitigation measures prior to construction. Fresno COG will be provided with documentation indicating compliance with all mitigation measures.

- Project implementation agencies will ensure that projects are consistent with federal, state, and local plans that preserve open space and recreation.
- Project implementation agencies will identify open space and recreation areas that could be preserved and will include mitigation measures (such as dedication or payment of in-lieu fees) for the loss of open space.
- Prior to final approval of each individual improvement project, the implementing agency will conduct the appropriate project-specific environmental review, including consideration of loss of open space and recreation.

- Potential significant impacts to open space will be mitigated.

- For projects that require approval or funding by the U.S. Department of Transportation, project implementation agencies will comply with Section 4(f) of the U.S. Department of Transportation Act.

Significance After Mitigation

It is anticipated that implementation of the Project could potentially result in the loss or disturbance of open space; therefore, this impact would remain significant and unavoidable.

Impact 3.10.4 – Loss of Agricultural Resources

Implementation of the proposed RTP could potentially result in the disturbance or loss of significant agricultural resources throughout the Fresno region. This would be considered a potentially significant impact. The County contains areas designated by the State as Prime Farmland, Unique Farmland, and Farmland of Statewide Importance. These areas are interspersed throughout urban areas or are located in undeveloped portions of the region. Development of highway, arterial and transit projects proposed under the RTP could potentially result in the disturbance or loss of some of these designated areas. Specifically, new projects involving construction would be most likely to result in impacts to these areas.

Mitigation Measures

The impact on significant agricultural resources will be evaluated as part of the appropriate project-specific environmental review, and mitigation measures will be identified to minimize impacts. Implementation agencies will be responsible for ensuring adherence to the mitigation measures prior to construction. Fresno COG will be provided with documentation indicating compliance with all mitigation measures.

- Individual projects will be consistent with federal, state, and local policies that preserve agricultural lands and support the economic viability of agricultural activities, as well as policies that provide compensation for property owners if preservation is not feasible.

- For projects in agricultural areas, project implementation agencies will contact the California Department of Conservation and the County Agricultural Commissioner's office to identify the location of prime farmlands and lands that support crops considered valuable to the local or regional economy.

- Prior to final approval of each individual improvement project, the implementing agency will establish conservation easement programs to mitigate impacts to prime farmland.

- Prior to final approval of each individual improvement project, the implementing agency will avoid impacts to prime farmlands or farmlands that support crops considered valuable to the local or regional economy.

- Prior to final approval of each individual improvement project, the implementing agency will encourage enrollments of agricultural lands in the Williamson Act.

Significance After Mitigation

It is anticipated that implementation of the Project could potentially result in the loss or disturbance of significant agricultural resources; therefore, this impact would be considered significant and unavoidable.

Impact 3.10.5 – Inconsistency with Local Land Use Plans

The Project has the potential to conflict with applicable adopted local land use plans and policies.

Most of the projects submitted for inclusion in the RTP, are developed through a local review process that involves local jurisdictions working with Fresno COG. For this reason, it is unlikely that any individual improvement project submitted would be inconsistent with a local jurisdiction's plan.

Mitigation Measures

- No mitigation measures are necessary.

Significance After Mitigation

Not applicable.

Cumulative Impact 3.10.6

Growth and development in the County will increase substantially by 2035. The 2011 RTP, by increasing mobility and including transportation measures, influences the pattern of this urbanization. The 2011 RTP's influence on growth contributes to regional cumulatively considerable impacts to land use and would change the intensity of land use in some areas.

Mitigation Measures

The mitigation measures listed above for Impacts 3.10.1 through 3.10.5 would be applied as mitigation for this impact. In addition, the following measure would apply.

- Regional planning efforts will be used to build a consensus in the region to support changes in land use to accommodate future population growth while maintaining the quality of life in the region.

Significance after Mitigation

In order to accommodate the projected population totals assumed for 2035, the region will need to change land uses and increase the intensity of some existing land use. The cumulative impact would remain significant.