Draft

Addendum Environmental Impact Report

March 7, 2017

Prepared For:

MADERA CTC
Madera County Transportation Commission

2001 Howard Road, Ste. 201
Madera, CA 93637
Ph: (559) 675-0721
www.maderactc.org

Prepared By:

VRPA TECHNOLOGIES, INC.

4630 W. Jennifer, Suite 105
Fresno, CA 93722
Ph: (559) 271-1200
www.vrpatechnologies.com

TABLE OF CONTENTS

Certification of the MCTC 2014 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) Program Environmental Impact Report (EIR) & Addendum EIR as the EIR for the Proposed 2014 Regional Transportation Plan/ Sustainable Communities Strategy Amendment #1

March 7, 2017

INTRODUCTION

The Madera County Transportation Commission (MCTC) has prepared an amendment (Amendment #1) to the 2014 Regional Transportation Plan and Sustainable Communities Strategy (2014 RTP/SCS). The 2014 RTP/SCS, adopted on July 24, 2014 by MCTC, included Chapter 6, the Sustainable Communities Strategy (SCS), which details how the Madera County region will reduce greenhouse gas (GHG) emissions to state-mandated levels over time. The inclusion of the SCS is required by Senate Bill 375, and stresses the importance of meeting GHG per capita emission reduction targets set by the California Air Resources Board (CARB). Unfortunately, the technical results of the modeling effort yielded GHG reduction results opposite of their anticipated outcome. The 2014 Madera County RTP/SCS was adopted with emission results that did not meet the GHG budgets established by the California Air Resources Board (CARB).

Table 6-5 in the adopted 2014 RTP/SCS provides the results of the SCS Scenario GHG reductions from the 2005 Base Year for year 2020 of 5 percent and 10 percent by the year 2035. Results show that the 2014 RTP and SCS did NOT meet the established emission reduction targets for either target year. As a result, it was appropriate for MCTC to review the transportation VMT reductions and the transportation model in its effort to meet the targets. Based upon the review, MCTC has prepared Amendment #1 to the 2014 RTP/SCS to reflect how GHG Emissions Targets will be met.

TABLE 6-5 (From the Adopted 2014 RTP/SCS)
Demonstration of GHG Emission Reduction Targets

Year	GHG Per Capita Reduction Targets	MCTC Per Capita GHG Reduction	Met Target?
2020	5.0%	+13.7%	No
2035	10.0%	+9.1%	No

OVERVIEW

Development of the 2014 Madera County RTP/SCS was a collective effort, which required meaningful collaboration with each of the three local governments (cities of Chowchilla and Madera and Madera County), State and federal agencies, local tribal governments, community interest groups, and public stakeholders to identify land-use and transportation opportunities within the region that will address the needs of the growing population and ensure compliance with State and federal requirements. As a result of this effort, MCTC developed varying planning scenarios built-up from a status quo planning assumption. Each scenario introduced new planning principles and parameters meant to address the intent of SB 375 and reduce GHG generated in Madera County. At all levels of outreach, the most aggressive planning scenario developed was received amiably and recommended to be forwarded in the process. This aggressive planning scenario would be selected as the preferred planning scenario of the 2014 RTP/SCS. The preferred scenario calls for a variety of shifts in planning parameters including, but not limited to, a demographic shift in housing share, changes to lot sizes, shift in employment share, enhancements to public transit systems, and enhancement of the non-motorized transportation network. These principles are most heavily emphasized in Madera County's established or planned urban cores and less emphasized in rural areas, which lack adequate population densities.

The parameters of the preferred RTP/SCS Scenario were utilized in the 2013/14 MCTC Transportation Model. Unfortunately, the technical results of the modeling effort yielded GHG reduction results opposite of their anticipated outcome. The 2014 Madera County RTP/SCS was adopted with emission results that did NOT meet the GHG budgets established by CARB.

2014 Madera County RTP/SCS GHG Targets

In 2011, the CARB issued a 5% reduction target to each of the eight (8) Metropolitan Planning Organizations (MPOs) in the San Joaquin Valley including MCTC. CARB agreed that the targets would be applicable to each MPO independently of other Valley MPOs. The targets included a percentage reduction of per capita greenhouse gas emissions from 2005 of 5 percent by the year 2020 and a reduction in GHG emissions of 10 percent by the year 2035. Developing the SCS requires meaningful collaboration with each of the local agencies, as well as stakeholders to identify land use and transportation planning opportunities around the region that will address the needs of the growing population and ensure compliance with State and federal requirements.

Analysis Tools Applied

Following the adoption of the 2014 RTP/SCS, MCTC staff immediately began analyzing what led to GHG emission results achieved during development of the adopted 2014 RTP/SCS. Given the wide gap between emissions results and emissions targets, despite pursuing the most feasibly aggressive SCS strategy proposed, MCTC staff began to analyze the planning tools utilized in the RTP/SCS

emissions reporting process; in particular the newly developed (2013/14) Madera County Transportation Model.

This analysis concluded the tools used by MCTC for the adopted 2014 RTP/SCS to account for GHG emissions could be enhanced to greatly improve accuracy in the reporting of emission results, particularly for the newly developed (2013/14) forecasting model. An extensive effort was undertaken to review the input data used in the transportation model. The bulk of the MCTC staff review focused on how land use and socioeconomic data (SED) was allocated in the model's base year and SB 375 comparison year (2010 and 2005 respectively), the significant roadway network utilized in the model, and the boundaries of traffic analysis zones (TAZs) used to distinguish individual geographic areas in Madera County. With these improvements to the model, the MCTC model validates better across the wide range of validation metrics that are required per the California RTP Guidelines. Further detail regarding how the transportation model was enhanced is available from MCTC.

✓ Socioeconomic Detail

The socioeconomic detail input file for the transportation model contains housing type and employment type data for TAZs covering the entirety of Madera County. Review of SED inputs utilized in the transportation model revealed a distribution of population and employment in Madera County capable of refinement to be more consistent with the true, on ground reality for 2005 and 2010 model years.

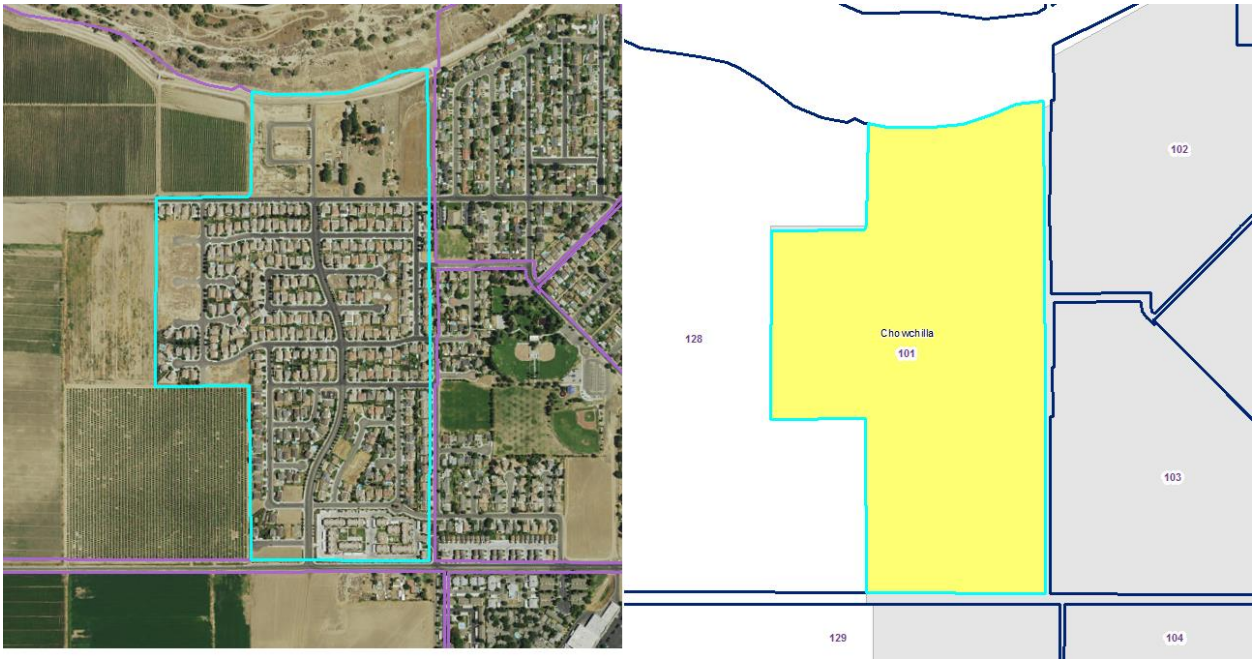
- *Housing*

  Review of SED inputs relating to housing indicated inaccuracies with the types of housing distributed throughout the County. Of particular note was the over population of mobile home dwelling types. Mobile home dwelling types were distributed throughout TAZs in the County despite evidence concluding that no such dwellings existed in the analysis years reviewed. Figure 1 displays a TAZ in the City of Chowchilla. Input data assigned 33 mobile home dwellings to this TAZ for the 2005 analysis year. Satellite imagery of this geographic area captured between July 30, 2004 and December 30, 2005 indicate no mobile homes existed between these time ranges. Similar instances of this dwelling type distribution occur in all jurisdictions and unincorporated communities throughout the County and varying degrees accounting for an estimated 2,500 over counting of mobile home type dwelling units.

  MCTC staff examined all TAZs with mobile home dwelling types assigned and made corrections where data existed to warrant them. This exercise revealed some instances of mobile home dwelling types being over-distributed while detached single family units were under-distributed in TAZs. Mobile units displaced in this exercise were replaced with single

family detached; single family attached or multifamily attached dwelling units indicative of the actual on-ground land use existing in these TAZs in the examined analysis year.

FIGURE 1
City of Chowchilla TAZs



- *Employment*

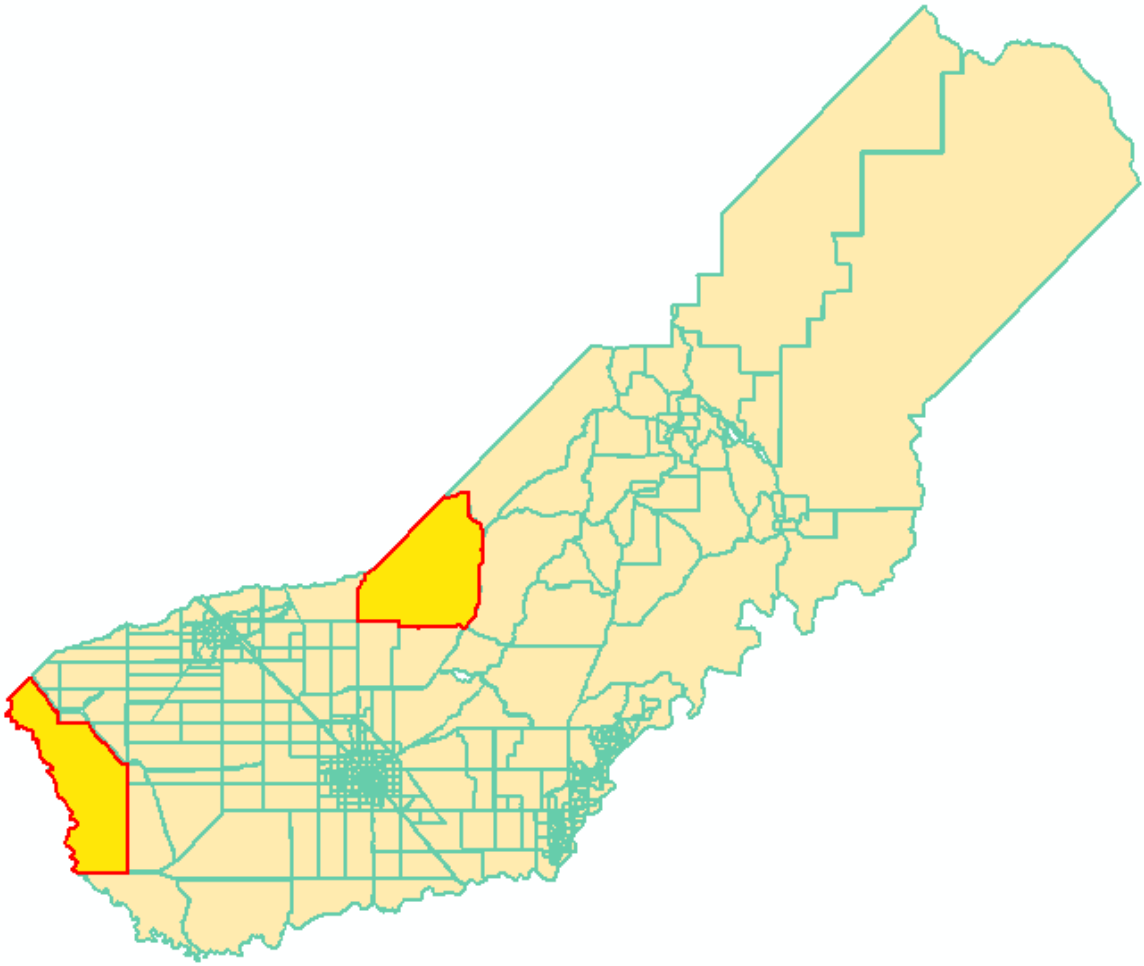
Review of SED inputs relating to employment indicated inaccurate employment levels and distribution at several locations. Most significant was the employment distribution of Agriculture jobs in 2005. Historical data indicates agriculture jobs, though varied in season, are static in quantity. This means throughout the planning window utilized for the 2014 RTP/SCS process, numbers of agricultural jobs should not fluctuate significantly. It was determined over 7,000 agriculture jobs were not counted in 2005. This input was edited to reflect a more realistic count of agriculture jobs in Madera County.

MCTC staff examined Madera County's largest single site employers. Changes were made to the manner employment was calculated for the prison complex in central Madera County. The employees were recognized to generate trip patterns more like 'warehouse' employment types as opposed to 'government' employment types. The land use was therefore reclassified to more accurately capture travel behavior as it exists in the context of a prison facility.

- *Outliers*

MCTC staff was able to identify two TAZs during the overall review process containing SED data significantly inconsistent with reality on the ground. Both of these TAZs were consistent with each other in the level of error contained within. Both TAZs were located in unincorporated areas of Madera County not within the immediate vicinity of any Madera County population centers, in areas zoned for agricultural uses, where the primary makeup of jobs and housing would be agricultural employment with a very small quantity of single family detached residential housing (See Figure 2). Both TAZs had significantly higher than expected quantities of housing and employment, as well as a large variety of different employment and housing types inconsistent with what actually existed within them.

FIGURE 2
County TAZs



✓ Significant Roadway Network

The traffic model does not analyze traffic on every roadway in the County, rather it accounts for travel on the most significant roadways. The roadway network is a line and point map of the significant streets, roads, and highways in Madera County. The lines and points contain specific data related to what facet of the roadway network they depict (facility type, number of lanes, speed limit, signalization at an intersection, etc.).

Upon examination of the significant roadway network, MCTC staff realigned roadway segments in several areas to make the network more closely align the real world geometries currently existing or to add new segments where warranted.

Planned capital improvement projects were checked to ensure the future year significant roadway network was consistent with planned roadway improvements.

✓ Traffic Analysis Zones

TAZs are spatial geographic areas designated to encompass a specific area in the traffic model. The size of a TAZ can range from a single densely packed city block, to a broad area encompassing an unincorporated rural community. Boundaries for TAZs primarily are created from the significant roadway network, and/or geopolitical borders and/or physical environmental features. Each TAZ has a centroid; extending from each TAZ centroid are centroid connectors responsible for distributing traffic onto the significant roadway network. MCTC staff reviewed the boundaries of the TAZs used for the model. Several new TAZs were created during this process.

A standard practice for TAZs in a traffic model is that they should not be intersected by any roadways from the significant roadway network the model uses nor should they be intersected by geographic features such as rivers. Several TAZs were bisected and realigned to adhere to this practice (See Figure 3).

MCTC staff created a new TAZ in rural eastern Madera County to capture traffic behavior related to the Chukchansi Tribe casino and hotel, Chukchansi Gold Resort and Casino. The casino and hotel were previously within a TAZ also containing a rural housing development, though neither entity shared any local roads; both are accessed off of a state highway at different locations. The new TAZ encompasses only the casino and hotel facility; one of Madera County's largest employers (See Figure 4).

✓ Transportation Model Review

Upon conclusion of SED data review and correction by MCTC staff, a SED data land use input file was reviewed by traffic modeling consultants against the latest Census, California Employment Development Department (EDD), Longitudinal Employer-Household Dynamics (LEHD), and American Community Survey (ACS) data at the County and city (Madera and Chowchilla) levels where available. The latest updates to the land use data accurately reflect the demographic, household, and employment data from the different sources.

Inaccuracies related to under-developed housing and employment totals in 2005 were deemed problematic given that 2005 is the year 2020 and 2035 must be measured against for GHG reductions as stipulated by SB 375.

FIGURE 3
Realigned TAZs

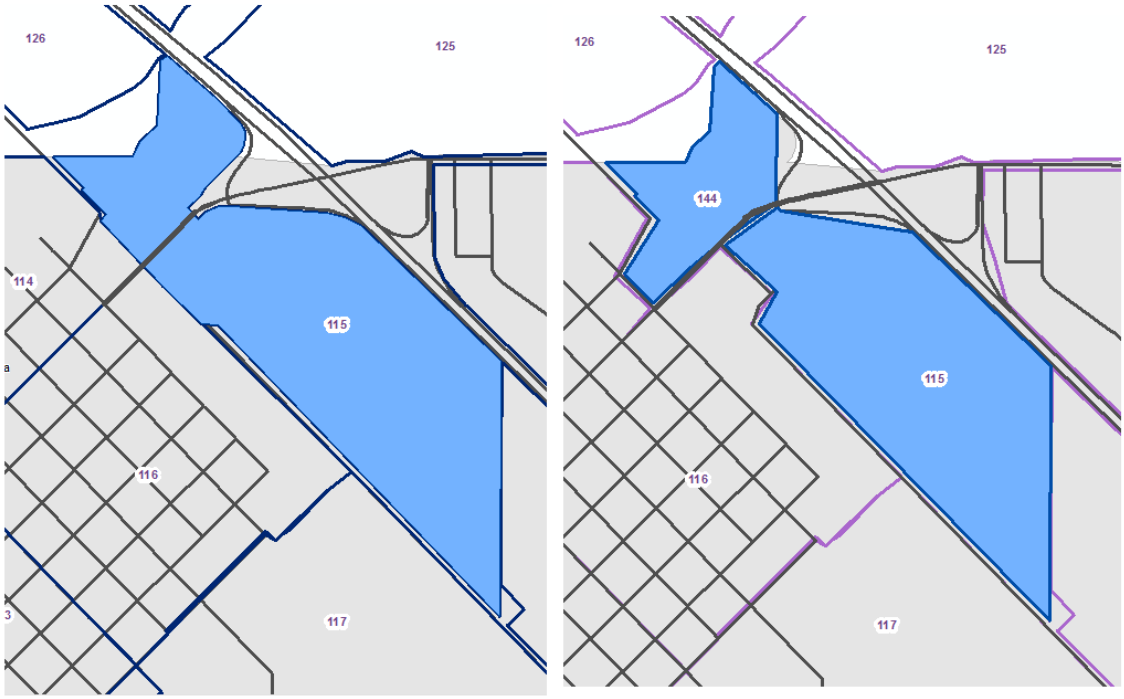


FIGURE 4
Chukchansi Casino TAZs

Measured reductions of future GHG emissions as the result of the planning parameters of the selected preferred Madera County 2014 RTP/SCS scenario were not able to be accurately accounted for when juxtaposed against a 2005 model year less developed than what actually did exist in 2005. Improvement to the 2005 comparison year is paramount to accurately convey GHG emission reductions as a result of the 2014 RTP/SCS planning effort for Madera County.

In addition to checking the new inputs, consultants found a few technical errors in the previous model runs. The model gateways (interregional trips) were updated to reflect the revised 2005 and 2010 scenario. The time of day (diurnal) factors were adjusted to add up to 100%. Some traffic counts were excluded from the validation because they were below the threshold for reasonableness for the model to estimate (500 for the daily scenario and 50 for the peak hour), and updated the calculation compared to the model for only roadways that had both counts and model volumes. With these improvements to the model, the MCTC model validates better across the wide range of validation metrics that it is required to meet per the California RTP Guidelines.

A great amount of effort has gone into making sure MCTC possesses the most adequate and accurate planning tools possible for utilization in the 2014 RTP/SCS Amendment #1 development process. The results of this effort have proven beneficial. All changes made to the model have been scrutinized to make sure that nothing implemented is inconsistent with the established and adopted measures prescribed in the preferred SCS scenario.

It should be noted that none of the multimodal improvement projects listed in the adopted 2014 RTP/SCS have been changed as a result of the enhanced modeling efforts described above.

2016 Transportation Model Enhancement Results

Based upon the set of transportation model enhancements and revisions discussed above, GHG reductions for the year 2020 and 2035 have been met (reference Table 1).

NEXT STEPS

Now that both the Year 2020 and 2035 targets have been achieved using the 2016 Transportation Model, the next step is for MCTC to amend the 2014 RTP/SCS and prepare the associated Addendum PEIR. This AEIR has been prepared to address potential environmental effects related to Amendment #1 of the 2014 RTP/SCS.

CEQA PROVISIONS

As a part of MTC's current review of the RTP Amendment #1, it is necessary to identify any areas of the 2014 RTP/SCS PEIR that might be substantially impacted by changes in the SCS including air quality and climate change or GHG emission conditions, energy, land use and planning, noise, population, housing and employment conditions, and transportation systems. Section 15162 of the California Environmental Quality Act (CEQA) provides that "[the lead agency…shall prepare an addendum to a previously certified EIR if some changes or additions are necessary but none of the conditions described in Section 15162 calling for preparation of a subsequent EIR have occurred." (CEQA Guidelines §15164(a)]. The referenced provision states that "no subsequent EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in the light of the whole record, one or more of the following:

- ✓ Substantial changes are proposed in the project, which will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects
- ✓ Substantial changes occur with respect to the circumstances under which the project is undertaken, which will require major revisions of the previous EIR or Negative Declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects

TABLE 1
2016 Madera County Transportation Model
2020 and 2035 Target Results

Descrition	Emissions or Target	Met Target?
2005 CO2 Emissions/Capita	17.0	
Target 5% Oer Capita From 2005	0.85	
2020 Target	**16.16**	
2020 CO2 Emissions/Capita	14.90	
2020 CO2 Reduction Needed (#/Capita)	-1.27	
2020 CO2 Reduction Needed (4 Vehicle Types)	-265816	
Target 10% per Capita From 2005	1.70	
2035 Target	**15.31**	
2035 CO2 Emissions/Capita	13.00	
2035 CO2 Reduction Needed (#/Capita)	-2.29	
2035 CO2 Reduction Needed (4 Vehicle Types)	-654544.0	
Results		
Change in CO2 Per Capita from 2005 to 2020	-12.5%	YES
Change in CO2 Per Capita from 2005 to 2035	-23.5%	YES

✓ New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the Negative Declaration was adopted, shows any of the following:

- The project will have one or more significant effects not discussed in the previous EIR or negative declaration
- Significant effects previously examined will be substantially more severe than shown in the previous EIR

- Mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; and/or
- Mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative

This AEIR, prepared pursuant to CEQA, Public Resources Code 21000 *et seq*., constitutes an Addendum to the 2014 RTP/CS Program EIR (PEIR) prepared and certified on July 24, 2014 and proposes that the certified 2014 PEIR serves as the PEIR for the proposed 2014 RTP/SCS Amendment #1 (Project). This AEIR outlines the changes to the Project, as analyzed in the 2014 PEIR, and evaluates whether those changes, or new information or changed circumstances, would require substantial changes to the impacts identified or mitigation measures proposed.

Based upon review of the Amended Project and review of the potential environmental effects, it has been determined that the proposed Project does not create any new significant adverse environmental impacts outside of the scope of the analyses already contained in the previously certified 2014 RTP/SCS PEIR. Since the Amended Project would not generate any new significant adverse environmental impacts or make any existing significant impacts substantially worse, an Addendum to the 2014 RTP/SCS PEIR has been prepared. The 2014 RTP/SCS, 2014 RTP/SCS PEIR, and the 2014 RTP/SCS AEIR prepared to address the 2014 RTP/SCS Amendment #1 can be found at www.maderactc.org and are on file at MCTC offices.

PROJECT DESCRIPTION

2014 Adopted RTP/SCS and Certified PEIR

The adopted 2014 RTP/SCS is a planning guide containing transportation policy and projects for a 26-year period (through Fiscal Year 2039/40). The Plan includes programs and policies for congestion management, transit, bicycles and pedestrians, roadways, freight, financing, and the SCS.

The RTP's primary use is as a regional long-range plan for federally funded transportation projects. It also serves as a comprehensive, coordinated transportation plan for all governmental jurisdictions within the region. Different jurisdictions have different transportation implementation responsibilities under the Plan. These jurisdictions include Caltrans, County of Madera, and the two incorporated cities. The RTP addresses effects of planned growth and development on the existing and planned transportation system and the resultant analysis documents existing and future year (Year 2039/40) multimodal transportation system conditions. Modes studied include highways and

arterials, public transit, aviation non-motorized systems, passenger and freight rail, goods movement, congestion management, and Intelligent Transportation Systems (ITS).

The process to approve the 2014 RTP/SCS included: (1) assessing Madera County's transportation needs, identifying projects to address the needs, evaluating the projects considering benefit vs. cost and other performance objectives, addressing the requirements set forth in SB 375 including the SCS, and addressing air quality conformity requirements; (2) conducting public hearings on the RTP/SCS by MCTC, and certification of the 2014 PEIR by MCTC, and (3) approval of a resolution passed by MCTC approving the 2014 RTP/SCS. Public involvement was encouraged throughout the 2014 RTP/SCS development process. The 2014 RTP/SCS consists of required elements and is organized into various chapters.

- ✓ Sustainable Communities Strategy: Chapter 6
- ✓ Goals, Objectives, and Policies: Chapter 4
- ✓ Multimodal: Section: Chapter 5
- ✓ Highway, Streets, and Roads: Chapter 5
- ✓ Urban Mass Transportation: Chapter 5
- ✓ Rural Area Public Transportation & Social Service Transportation: Chapter 5
- ✓ Aviation: Chapter 5
- ✓ Non-Motorized Transportation: Chapter 5
- ✓ Rail: Chapter 5
- ✓ Specific Transportation Strategies & Management Systems: Chapter 5
- ✓ Air Quality: A separate report provided on the MCTC Website
- ✓ Environmental Mitigation: Chapter 9
- ✓ Financial Element: Chapter 7
- ✓ Public Participation: Chapter 8

The RTP, in conjunction with General Plan Circulation Elements adopted by the County of Madera and each of the cities within the County, designates the location and scale of existing and proposed transportation systems. The financing program contained in the 2014 RTP/SCS considered a projection of funding sources that may be available to finance transportation improvement projects over time. The projection of funds was accomplished considering historical allocations of federal, state and other funding.

The 2014 RTP/SCS, adopted on July 24, 2014 by MCTC, included Chapter 6, the Sustainable Communities Strategy (SCS), which details how the Madera County region will GHG emissions to state-mandated levels over time. The inclusion of the SCS is required by Senate Bill 375, and stresses the importance of meeting GHG per capita emission reduction targets set by CARB. Unfortunately, the technical results of the modeling effort yielded GHG reduction results opposite of

their anticipated outcome. The 2014 Madera County RTP/SCS was adopted with emission results that did NOT meet the GHG budgets established by CARB.

To evaluate the regional impacts associated with the 2014 RTP/SCS, a Program EIR was prepared and certified. CEQA guidelines (Section 15168) define a Program EIR as, "an EIR that may be prepared on a series of actions that can be characterized as one large project and are related either geographically, or are logical parts in the chain of contemplated actions, or are in connection with issuance's of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program, or as individual activities carried out under the same authorizing statutory or regulatory authority and having generally similar environmental effects, which can be mitigated in similar ways."

Amended Project - Amendment #1 to the 2014 RTP/SCS and Addendum EIR

After reviewing CEQA Section 15164 (referenced above), it was determined that the obligation to prepare a Subsequent or Supplemental EIR for Amendment #1 was not met and that an Addendum was the appropriate environmental document to address the 2014 RTP/SCS Amendment #1. The scope of the proposed 2014 RTP/SCS Amendment #1 will be narrow and targeted at incorporating enhancement results reflected in the 2016 transportation model, resulting GHG and air quality emissions, and changes transportation analysis results. Proposed RTP Amendment #1 necessitates preparation of revised air quality, climate change or GHG, population, housing, and employment, and transportation/traffic analysis, and results of the 2017 air quality conformity analysis contained in the air quality section of this Addendum PEIR.

FINDINGS OF THE 2014 PEIR

CEQA requires that a Final EIR be prepared, certified, and considered by decision-makers prior to taking action on a project. The Final EIR provides the local agency an opportunity to respond to comments received on the Draft EIR and to incorporate any changes or additions necessary to clarify and/or supplement the information contained in the document. The Final EIR prepared for the 2014 RTP/SCS, therefore, represents the culmination of all environmentally related issues raised during the comment period on the Draft EIR. In addition, the Final EIR contains a Mitigation Monitoring and Reporting Program that identifies the necessary processes that are required to ensure that the mitigation measures recommended in the Draft EIR are implemented.

The Final EIR for the 2014 RTP/SCS is composed of the following documents:

- ✓ 2014 RTP/SCS, Draft Program EIR, Released for Public Review on May 1, 2014
- ✓ 2014 RTP/SCS, adopted on July 24, 2014

- ✓ 2014 RTP/SCS, Final EIR, Mitigation Monitoring and Reporting Program, and Statement of Overriding Considerations, certified on July 24, 2014

The summary of mitigation measures and the mitigation monitoring program identified in the certified 2014 RTP/SCS PEIR remain applicable considering changes reflected in this AEIR.

CHANGES TO THE CERTIFIED 2014 RTP/SCS PEIR

The purpose of this AEIR is to reflect changes and additions to the previously certified 2014 RTP/SCS PEIR. Considering CEQA provisions detailed previously, the 2014 RTP/SCS Amendment #1 will:

- ✓ Not cause additional significant environmental effects addressed in the 2014 RTP/SCS PEIR other than those already identified
- ✓ The effects referenced in the 2014 RTP/SCS PEIR will not be substantially more severe as a result of changes identified in the 2014 RTP/SCS Amendment #1
- ✓ Mitigation measures contained in the 2014 RTP/SCS PEIR would continue to be feasible and would reduce environmental effects of changes referenced in this AEIR

While the proposed changes to the 2014 RTP/SCS and RTP/SCS Amendment #1 may represent "*New information of substantial importance*…" as stated in 15162(a)(3), these changes will not result in one or more significant effects that are not already discussed in the previous EIRs, nor result in impacts that are substantially more severe than shown in the 2014 RTP/SC PEIR. Based upon the findings described above, the RTP/SCS Amendment will not require major revisions of the 2014 RTP/SCS PEIR for the following reasons:

- ✓ Potential impacts and mitigation factors have been adequately addressed in the certified 2014 RTP/SCS PEIR and reviewed in this Addendum EIR
- ✓ Each individual transportation project referenced in the 2014 RTP/SCS is not proposed to change and no additional projects have been added to the adopted 2014 RTP/SCS as part of RTP/SCS Amendment #1. All projects listed in the adopted 2014 RTP/SCS will continue to be evaluated by the responsible local agency to identify potential environmental effects
- ✓ The environmental impacts associated with Addendum #1 have been lessened or remain unchanged from those listed in the certified RTP/SCS PEIR
- ✓ After reviewing CEQA Section 15164, it has been determined that the obligation to prepare a Supplemental or Subsequent EIR is not met

To further justify that changes reflected in the 2014 RTP/SCS Amendment #1 will not cause additional environmental effects or require changes to mitigation measures contained in the 2014 RTP/SCS PEIR or in RTP/SCS Amendment #1 AEIR, the following sections that replace sections contained in the Final and Draft PEIRs for the 2014 RTP/SCS and tables have been prepared and are

provided below. Only data and analysis results have been revised to address changes as a result of enhancements reflected in the 2016 MCTC Transportation Model. The Regulatory Environment and other required content included in the 2014 RTP/SCS PEIR has not been revised.

Chapter 2 – Introduction (Sections below replace sections in Chapter 2.0 in the 2014 RTP/SCS Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

Table 2-1 in Chapter 2.0 on page 2-12 of the 2014 RTP/SCS Draft PEIR is replaced with Table 2-1 below.

TABLE 2-1
Madera County Development Projections
2010, 2020, 2035, and 2040

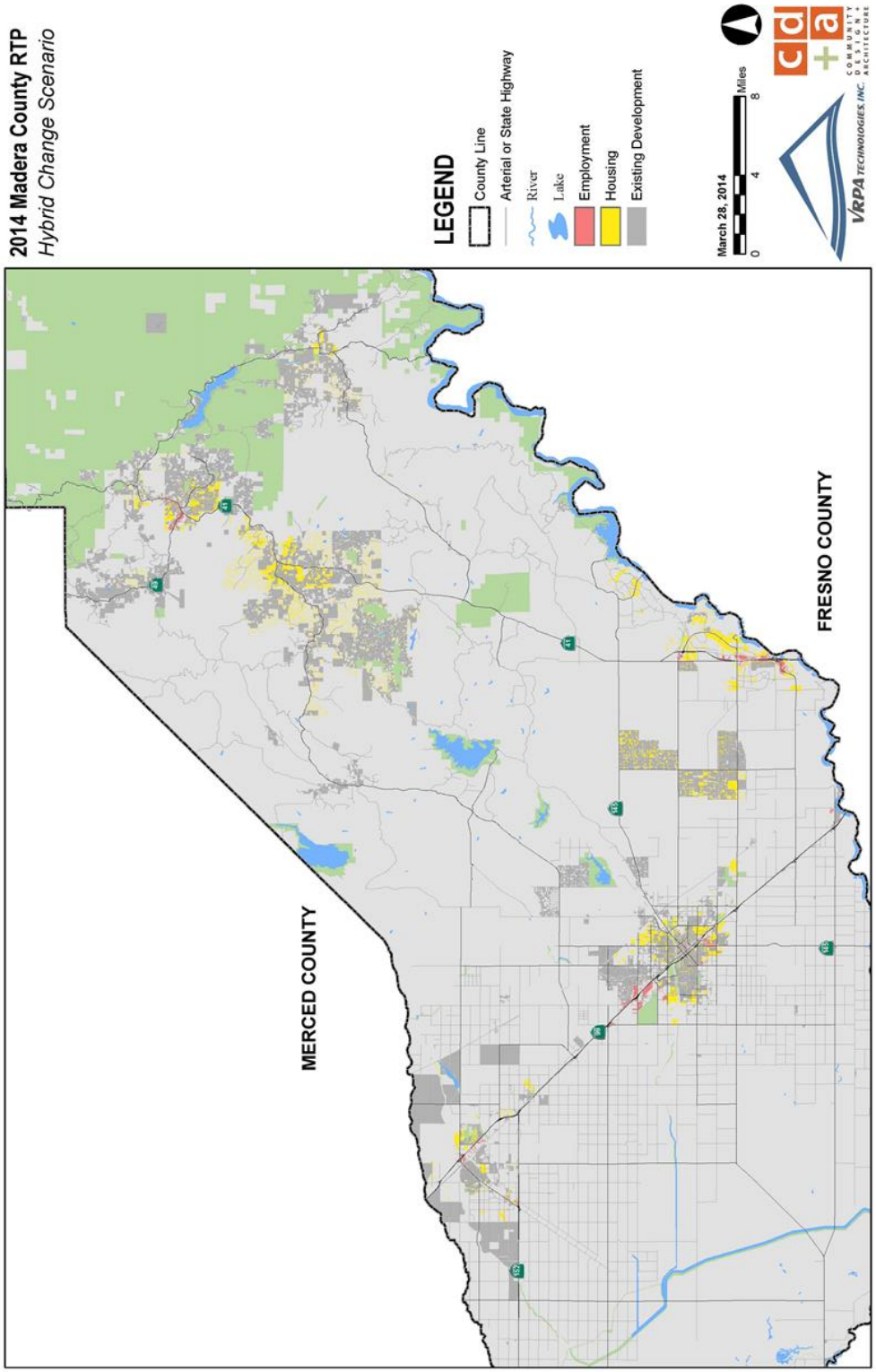
YEAR	SOCIO-ECONOMIC CONDITIONS	GROWTH AREA					Total
		Chowchilla	Madera	Mountain Area	Madera County SE New Growth Area	Remaining Rural Area	
2010	Population	13810	76516	41535	1509	17496	150865
	Households	3964	21963	11922	433	5022	43304
	Employment	5384	20154	7552	2924	7533	43547
2020	Population	16078	88741	43973	16305	18079	183176
	Households	4893	27006	13382	4962	5502	55745
	Employment	6201	24855	8961	7363	7815	55195
2035	Population	20489	112681	50760	38319	20281	242530
	Households	6286	34570	15573	11756	6222	74407
	Employment	7556	32387	11255	14092	8418	73708
2040	Population	22199	121984	53617	46109	21252	265161
	Households	6750	37091	16303	14020	6462	80626
	Employment	8007	34897	12020	16334	8619	79877

Source: MCTC 2016 Transportation Model and VRPA Technologies, Inc.
Includes group quarters population

Figure 2-2 in Chapter 2.0 on page 2-13 of the 2014 RTP/SCS Draft PEIR is replaced with Figure 2-2 below.

FIGURE 2-2

Preferred RTP and SCS PEIR Alternative SCS Scenario



The 3rd paragraph and Table 2-2 in Chapter 2.0 on page 2-14 of the 2014 RTP/SCS Draft PEIR is replaced with the paragraph below.

As part of its mandate under SB 375, in 2010, the California Air Resources Board (CARB) adopted specific GHG emission reduction targets for cars and light trucks for each of the state's 18 metropolitan planning organizations from a 2005 base year as detailed in CARB's Staff Report and Functional Equivalent Document dated August 2010. The GHG targets set for the Madera region call for a 5 percent per capita reduction by 2020, and a 10 percent per capita reduction by 2035. SB 375 requires that MCTC demonstrate in its SCS that GHG emission reduction targets will be met for 2020 and 2035. If not, then an Alternative Planning Strategy (APS) shall be prepared to demonstrate how the targets can be met through the alternative strategies in the APS. Based upon the SCS analysis described in Chapter 6 of the RTP and SCS, MCTC will be able to meet the targets set by the ARB through its 2014 RTP and SCS as shown below in Table 2-2.

TABLE 2-2
Demonstration of GHG Emission Reduction Targets
Future VMT and GHG Emissions

Year	Pounds per Capita GHG Emissions[1]	% Change from 2005	VMT Per Capita	% Change from 2005
2005	17.0	--	18.7	--
2020	14.9	12.5%	17.0	9.1%
2035	13.0	23.5%	15.4	17.6%

1: Total CO2 Emissions
Source: MCTC, EMFAC 2014

The last paragraph in Chapter 2.0 on page 2-14 of the 2014 RTP/SCS Draft PEIR is replaced with the paragraph below.

Based upon the results of the alternative scenario development process, Madera County is able to meet the SCS GHG 5 and 10 percent GHG emission reduction targets. Following approval of the 2014 RTP/SCS on July 24, 2014, it was appropriate for MCTC to review the transportation VMT reductions and the transportation model in its effort to meet the targets. Based upon the review, MCTC has prepared Amendment #1 to the 2014 RTP/SCS to reflect how GHG Emissions Targets will be met.

The last paragraph in Chapter 2.0 under Projected 2040 Travel Characteristics on page 2-20 of the 2014 RTP/SCS Draft PEIR is replaced with the paragraph below.

Facilities along the Regionally Significant Road System (shown in Figure 2-3), are consistent with the Functional Classification System developed by the Federal Highway Administration (FHWA). These facilities, along with other major streets and highways, are included in the Madera County Regional Transportation Model network for the Year 2040. The traffic model was recently updated in 2016 to reflect expected growth and development within the County as projected by the State Department of Finance (DOF) and derived by the Madera County Transportation Commission (MCTC) and other local agency staff. The model was calibrated and validated for the year 2010 to reflect existing traffic conditions considering actual traffic counts taken along major street and highway segments throughout the region. In addition, the street and highway network was revised to accurately reflect the required improvements in the County needed to accommodate traffic to the year 2040.

The 1st paragraph in Chapter 2.0 under Projected 2040 Travel Characteristics on page 2-21 of the 2014 RTP/SCS Draft PEIR is replaced with the paragraph below.

The forecast of traffic generated by the projected population, housing and employment indicates that total vehicle trips will increase 2010 and 2040. This is attributed to continued use of major transportation corridors in the region by future growth and development. Furthermore, vehicle miles of travel (VMT) in 2040 are also forecast to increase from 2010. Much of the increase in VMT is due to longer distance trips; especially commute trips to and from Fresno for employment opportunities.

The last bullet in Chapter 2.0 titled "Level of Service Analysis" on page 2-26 of the 2014 RTP/SCS Draft PEIR is replaced with the paragraphs and table below. The 2nd paragraph under that bullet is not replaced.

- Based on an examination of the analysis, findings, and conclusions of the certified 2014 RTP/SCS PEIR, implementation of the Project would not increase the severity of impacts identified in the Previous EIR, nor would it result in new significant impacts related to transportation and traffic that were not identified in the certified PEIR. The Project would not result in significant off-site or cumulative effects related to transportation and traffic not previously discussed because projects contained in the adopted 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the certified 2014 RTP/SCS PEIR. In fact, the enhanced transportation modeling result a reduction in overall traffic impacts compared to the certified 2014 RTP/SCS PEIR.

- Table 2-2a below provides a comparative analysis of roadway level of service (LOS) impact of the 2014 RTP/SCS from the certified PEIR with analysis using the enhanced and revised MCTC Transportation Model. Examining Table 2-2a, it is evident that the enhanced transportation modeling indicates the same or reduced traffic impacts at most locations compared to the certified 2014 PEIR. Three cases of apparently worsened impact were examined more closely. This further analysis found that the SR 99 - SB Off Ramp at Olive Avenue will function adequately at the signalized intersection at the end of the ramp, which is the critical location controlling flows from the ramp. At the two other locations with apparent worsening LOS (Avenue 16 from Granada Drive to Schnoor Street, and Avenue 12 from Road 36 to Road 38), it was found that the apparent degradation was due to incorrect modeling and analysis assumptions. With appropriate inputs and assumptions, it was determined that each of these roadway segments will operate at an acceptable Level of Service (LOS). Therefore, the 2014 RTP/SCS Amendment #1 will not further exceed, either individually or cumulatively, the level of service standard.

TABLE 2-2a
2014 RTP/SCS Model LOS Results VS. 2016 Model LOS Results

ROADWAY SEGMENT	2040 LOS DEFICIENCIES: MCTC 2014 RTP and SCS		MCTC Model File Provided in 2016		NOTES and COMMENTS
	AM Peak	PM Peak	AM Peak	PM Peak	
SR 41 - County Line to Allen Road	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 41 - Allen Road to Bass Lake Road	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 41 - SR 49 to Road 420	LOS E	LOS D	LOS C or Better	LOS F (partial) LOS E (partial - majority)	Segment was deficient for AM or PM conditions under either model.
SR 41 - Holly Lane to Road 415	LOS E / F(partial)	LOS E	LOS C or Better	LOS F (NB) / E (SB)	AM Peak in 2016 improved. PM Peak still deficient. No change for segment.
SR 41 - Road 415 to Spinelli Road	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 41 - Spinelli Road to Road 200	LOS C or Better LOS D (partial) / LOS F (partial)	LOS E	LOS C or Better	LOS C or Better	LOS improved.
SR 41 - Road 200 to Road 406	LOS F	LOS F	LOS C or Better	LOS D (NB)	LOS improved.
SR 41 - Road 406 to SR 145	LOS C or Better LOS D (partial) / LOS F (partial)	LOS C or Better LOS D (partial) / LOS F (partial)	LOS C or Better	LOS C or Better LOS D (NB partial)	LOS improved.
Avenue 9 - Road 40 to Crocket Way	LOS C or Better LOS D (partial)	LOS D	LOS C or Better	LOS C or Better	LOS improved.
SR 99 - Avenue 27 to Avenue 24 1/2	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 99 - Avenue 24 1/2 to SR 152	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 99 - SB On-Ramp at Avenue 24	LOS C or Better	LOS C or Better	LOS C or Better	LOS D	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 20 SB Off Ramp to SB On Ramp	LOS C or Better	LOS C or Better	LOS D (SB)	LOS D (NB)	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 20 to Avenue 18 1/2 Off Ramp	LOS C or Better	LOS C or Better	LOS D (SB)	LOS D	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 18 1/2 SB Off Ramp to SB On Ramp	LOS C or Better	LOS C or Better	LOS D (SB)	LOS C or Better	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 18 1/2 SB On Ramp to Avenue 17	LOS C or Better	LOS C or Better	LOS D (SB)	LOS C or Better	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 17 to Ellis Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Airport Drive - South of Avenue 17	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (NB)	2016 LOS Within Min. LOS Standard
SR 99 - Cleveland Avenue to 4th Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
H Street - North of 4th Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (NB)	2016 LOS Within Min. LOS Standard
N Street - North of 4th Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (SB)	2016 LOS Within Min. LOS Standard
SR 99 - Yosemite Avenue to Olive Avenue	LOS C or Better	LOS C or Better LOS F (partial)	LOS C or Better	LOS C or Better	LOS improved.
SR 99 - NB On Ramp at Madera Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS D	2016 LOS Within Min. LOS Standard
SR 99 - SB Off Ramp at Olive Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS E	Ramps inappropriate for LOS calculation; the signalized intersection LOS at end of the ramp will be Within Standard
Cleveland Avenue - Gateway Drive to Cleveland Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (NB)	2016 LOS Within Min. LOS Standard
Cleveland Avenue - Raymond Road to SR 145	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Tozer Street - SR 145 to Avenue 15	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Avenue 16 - Granada Drive to Schnoor Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS E EB (partial) LOS F NB (partial)	This is due to a model coding error. The links are already 2 lanes in each direction. The model is showing 1 lane in each direction. LOS with 4 lanes will be LOS D or better.
Avenue 15 - Road 28 to Road 28 1/2	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Avenue 14 - SR 99 SB Off Ramp to Madera Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (EB)	2016 LOS Within Min. LOS Standard
Avenue 14 - East of Roosevelt Ave	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (EB)	2016 LOS Within Min. LOS Standard
Avenue 12 - Road 36 to Road 38	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (partial) LOS E (partial)	Ave 12 has a segment with a two way left turn lane and a segment without a two way left turn lane. If the two way left turn lane is extended to the entire segment in the future, LOS D would be achieved with the forecasted traffic. The Florida tables capacity value we would normally use for Madera County roadway segment analysis is conservative. This could be expressed mathematically by assuming more green time than the default value, if needed. If the two way left turn land is not extended in the future, we could still claim LOS D as the result if we consider Avenue 12 to be a rural/uninterrupted roadway in the segment without a two way left turn lane, which it will continue to function as. The area is not considered urban.

Air Quality (The section below replaces Section 3.4 Air Quality in the 2014 RTP/SCS Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

3.4 AIR QUALITY

This section describes the environmental and regulatory setting for air quality in the Madera County region and analyzes the potential air quality impacts resulting from the implementation of MCTC's 2040 RTP. This section portrays the existing air quality conditions in the Madera County region, related air quality regulations, the air quality impacts of project construction and operation, and where necessary and feasible, identification of any mitigation measures required to reduce impacts.

Regulatory Setting

Air quality within the Project area 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 Madera County are discussed below along with their individual responsibilities.

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 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, and lead.

The Clean Air Act Section 176(c) (42 U.S.C. 7506(c)) and 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.

The EPA approved San Joaquin Valley reclassification of the ozone (8-hour) designation to extreme nonattainment in the Federal Register on May 5, 2010, even though the San Joaquin Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard. In accordance with the FCAA, 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 revised more-stringent primary standard for ozone was set at 0.075 parts per million (ppm) measured over an 8-hour period. EPA also revised the secondary standard, designed to protect welfare, at 0.075 ppm, making it identical to the primary standard. The existing ozone standard was set in 1997 at 0.08ppm.

Madera County is considered to be in nonattainment of ozone and $PM_{2.5}$ standards.

Federal Regulations

- ✓ **National Environmental Policy Act (NEPA) -** 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 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 Madera 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 California Clean Air Act (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.

On March 14, 2012, EPA published the Transportation Conformity Rule Restructuring Amendments, effective April 13, 2012 (EPA, 2012). The amendments restructure several sections of the rule so that they apply to any new or revised National Ambient Air Quality Standards. In addition, several clarifications to improve implementation of the rule were finalized.

- ✓ **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.

State Agencies

- ✓ **California Air Resources Board (CARB) -** The CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing its own air quality legislation called the CCAA, adopted in 1988. The ARB was created in 1967 from the merging of the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory.

  The ARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the National Ambient Air Quality Standards (NAAQS) established by the EPA. Whereas the ARB has primary responsibility and produces a major part of the SIP for pollution sources that are statewide in scope, it relies on the local air districts to provide additional strategies for sources under their jurisdiction. The ARB combines its data with all local district data and submits the completed SIP to the EPA. The SIP consists of the emissions standards for vehicular sources and consumer products set by the ARB, and attainment plans adopted by the Air Pollution Control Districts (APCDs) and Air Quality Management District's (AQMDs) and approved by the ARB.

  States may establish their own standards, provided the state standards are at least as stringent as the NAAQS. California has established California Ambient Air Quality Standards (CAAQS) pursuant to California Health and Safety Code (CH&SC) [§39606(b)] and its predecessor statutes.

  The CH&SC [§39608] requires the ARB to "identify" and "classify" each air basin in the state on a pollutant-by-pollutant basis. Subsequently, the ARB designated areas in California as nonattainment based on violations of the CAAQSs. Designations and classifications specific to the SJVAB can be found in the next section of this document. Areas in the state were also classified based on severity of air pollution problems. For each nonattainment class, the CCAA specifies air quality management strategies that must be adopted. For all nonattainment categories, attainment plans are required to demonstrate a five-percent-per-year reduction in nonattainment air pollutants or their precursors, averaged every consecutive three-year period, unless an approved alternative measure of progress is developed. In addition, air districts in violation of CAAQS are required to prepare an Air Quality Attainment Plan (AQAP) that lays out a program to attain and maintain the CCAA mandates.

  Other ARB duties include monitoring air quality. The ARB has established and maintains, in conjunction with local APCDs and air quality management districts, a network of sampling stations (called the State and Local Air Monitoring [SLAMS] network), which monitor the present pollutant levels in the ambient air.

Madera County is in the ARB-designated, SJVAB. A map of the SJVAB is provided in Figure 3-3. In addition to Madera County, the SJVAB includes San Joaquin, Kern, Kings, Fresno, Merced, Stanislaus, and Tulare Counties. Federal and State standards for criteria pollutants are provided in Table 3-4.

FIGURE 3-3
California Air Basins

TABLE 3-4
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National 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)[8]	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)[8]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[9]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[10]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[10]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[10]	—	
Lead[11,12]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[13]	8 Hour	See footnote 13	Beta Attenuation and Transmittance through Filter Tape	No National 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[11]	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 (6/4/13)

Footnotes:

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and 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 arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site 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 the U.S. EPA for further clarification and current national 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 measurement method 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 U.S. 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 U.S. EPA.
8. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 µg/m3 to 12.0 µg/m3. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 µg/m3, as was the annual secondary standard of 15 µg/m3. The existing 24-hour PM10 standards (primary and secondary) of 150 µg/m3 also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
9. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm).

To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.

10. On June 2, 2010, a new 1-hour SO2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.

11. 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.

12. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

13. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

State Regulations

- ✓ **ARB 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 ARB'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 ARB has adopted regulations, which required auto manufacturers to phase in less polluting vehicles.

- ✓ **California Clean Air Act -** The 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. The ARB is the agency responsible for administering the CCAA. The ARB established ambient air quality standards pursuant to the CH&SC [§39606(b)], which are similar to the federal standards. The San Joaquin Valley Air Pollution Control District (SJVAPCD) 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 Toxic Air Contaminants (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 ARB 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, ARB has identified more than 21 TACs and has adopted EPA's list of Hazardous Air Pollutants (HAPs) as TACs. Most recently, diesel PM was added to the ARB 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 Best Available Control Technology (BACT) to minimize emissions.

  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. ARB 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, ARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. The ARB adopted amendments to the public-transit bus-fleet rule in October 2003, as well as adopt interim certification procedures for hybrid-electric vehicles in the urban bus and heavy-duty vehicle classes.

All transit agencies are expected to be in compliance with all emission reduction requirements of the regulation since the ultimate phase-in date for all urban bus and transit fleet vehicles was December 31, 2010. Urban Bus (UB) fleets are required to exhibit an 85% reduction of PM from the 2002 baseline and a NOx fleet average of 4.8 g/bhp-hr. Transit Fleet Vehicle (TFV) are required to exhibit an 80% reduction of PM from the 2005 baseline and a NOx fleet average of 2.4 g/bhp-hr.

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.

- ✓ **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.).

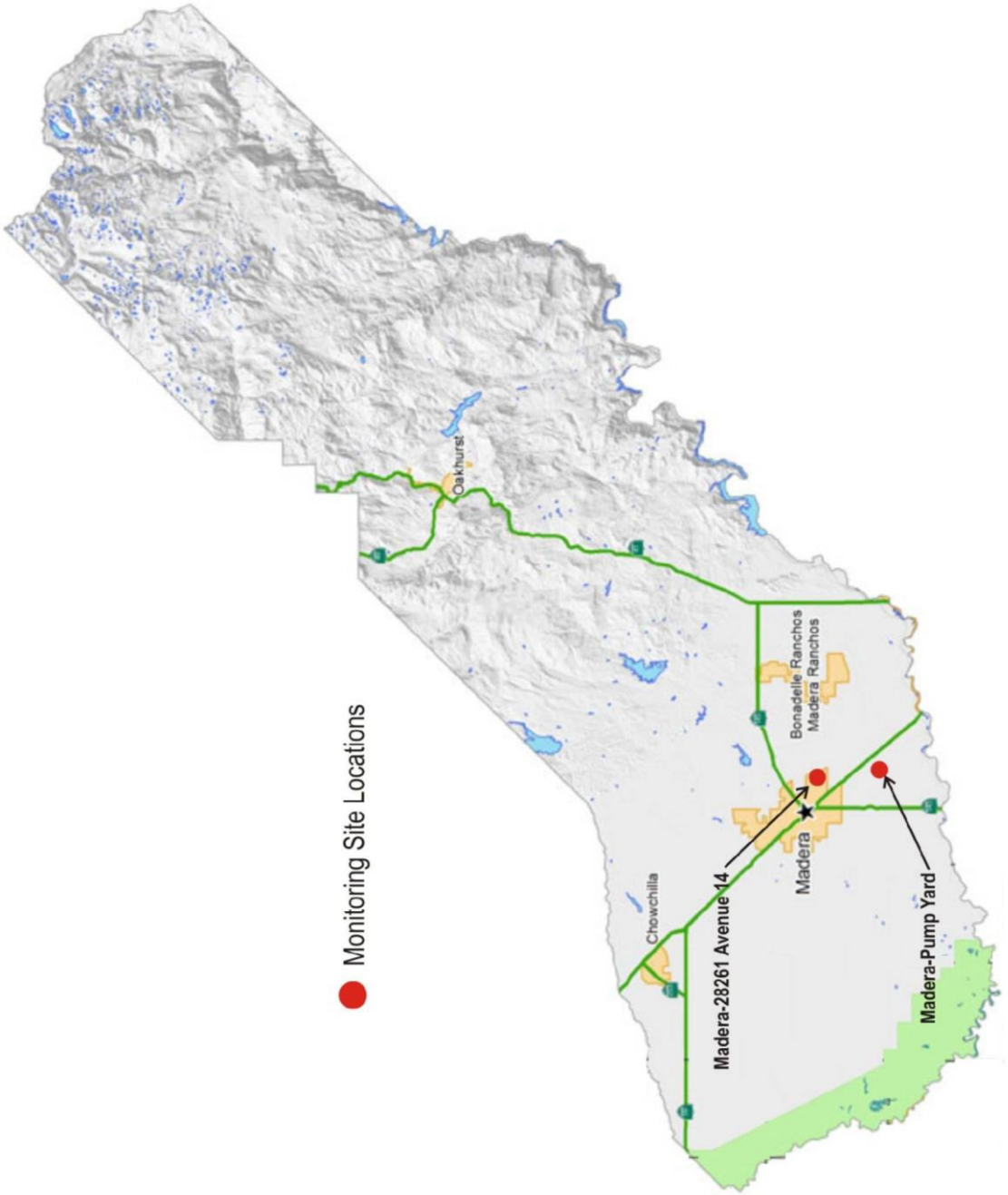
Regional Agencies

- ✓ **San Joaquin Valley Air Pollution Control District -** The SJVAPCD is the agency responsible for monitoring and regulating air pollutant emissions from stationary, area, and indirect sources within Madera County and throughout the SJVAB. The District also has responsibility for monitoring air quality and setting and enforcing limits for source emissions. The ARB 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 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. There are two (2) air quality-monitoring sites located throughout Madera County, which are shown below and illustrated in Figure 3-4.

  - Madera-28261 Avenue 41
  - Madera-Pump Yard

FIGURE 3-4
Air Quality Monitoring Sites



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 2013 Ozone Plan to achieve Federal and State standards for improved air quality in the SJVAB regarding ozone. The 2013 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 2013 Ozone Plan calls for major advancements in pollution control technologies for mobile and stationary sources of air pollution. The 2013 Ozone Plan calls for a 75-percent reduction in ozone-forming oxides of nitrogen emissions. The 2013 Ozone Plan also addresses the remaining requirement under the 1979 revoked 1-hour ozone NAAQS.

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 the ARB. The ARB 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 *2012 PM.2.5 Plan* to achieve Federal and State standards for improved air quality in the SJVAB. The *2012 PM.2.5 Plan* provides a comprehensive list of regulatory and incentive based measures to reduce PM2.5.

In addition to the *2013 Ozone Plan, the 2012 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. The SJVAPCD is currently in the process of updating the GAMAQI and was used as a guidance document for this analysis.

The SJVAPCD 2013 Ozone, 2007 PM_{10}, 2012 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 2014 RTP can be found in the Draft MCTC 2017 Conformity Analysis for the 2017 Federal Transportation Improvement Program and the 2014 Regional Transportation Plan (Conformity Analysis), which is available on the MCTC website at www.maderctc.org.

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 the 2014 RTP does not impact the implementation of any SJVAPCD regulations or incentives on other emissions source categories.

Each of the SJVAPCD plans (2013 Ozone Plan, 2012 $PM_{2.5}$ 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 2014 RTP are measured.

The EPA defines specific years in which attainment of the federal standards must be reached, and therefore each of these SJVAPCD plans for which the SJVAB 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 3-5 through 3-7 below reflect "thresholds" or "not to exceed" values in the "budget years" for the identified pollutant in order to achieve attainment.

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.

TABLE 3-5
On-Road Motor Vehicle Budgets (Summer tons/day)

County	2017		2020		2023	
	ROG	NOx	ROG	NOx	ROG	NOx
Madera	1.8	5.0	1.3	4.0	1.1	2.3

Source: Conformity Analysis 2017 FTIP/2014 RTP

TABLE 3-6
On-Road Motor Vehicle PM-10 Emissions Budgets
(Tons per average annual day)

County	2020	
	PM10	NOx
Madera	1.6	4.2

Source: Conformity Analysis 2017 FTIP/2014 RTP

TABLE 3-7
On-Road Motor Vehicle PM-2.5 Emissions Budgets
(Tons per average annual day)

County	2017	
	PM2.5	NOx
Madera	0.2	5.3

Source: Conformity Analysis 2017 FTIP/2014 RTP

Environmental Setting

- **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.

This section describes existing air quality within the San Joaquin Valley Air Basin (SJVAB) and in Madera 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. Air quality can be directly affected by the type and density of land use change and population growth in urban and rural areas.

Geographic Location

The SJVAB is comprised of eight counties: Madera, Kern, Kings, Fresno, 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.

Topographic Conditions

Madera County is located within the SJVAB [as determined by the California Air Resources Board (CARB)]. 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

Madera County is located in one of the most polluted air basins in the country; the SJVAB. 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 Madera 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, Madera County experiences cold temperatures and calm conditions that increase the likelihood of a climate conducive to high CO concentrations.

Precipitation and fog tend to reduce or limit some pollutant concentrations. Ozone needs sunlight for its formation, and clouds and fog block the required radiation. CO is slightly water-soluble so precipitation and fog tends to "reduce" CO concentrations in the atmosphere. PM-10 is somewhat "washed" from the atmosphere with precipitation. Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high-pressure belt located off the Pacific coast. In the winter, this high-pressure system moves southward, allowing Pacific storms to move through the San Joaquin Valley. These storms bring in moist, maritime air that produces considerable precipitation on the western, upslope side of the Coast Ranges. Significant precipitation also occurs on the western side of the Sierra Nevada. On the valley floor, however, there is some down slope flow from the Coast Ranges and the resultant evaporation of moisture from associated warming results in a minimum of precipitation. Nevertheless, the majority of the precipitation falling in the San Joaquin Valley is produced by those storms during the winter. Precipitation during the summer months is in the form of convective rain showers and is rare. It is usually associated with an influx of moisture into the San Joaquin Valley through the San Francisco area during an anomalous flow pattern in the lower layers of the atmosphere. Although the hourly rates of precipitation from these storms may be high, their rarity keeps monthly totals low.

Precipitation on the San Joaquin Valley floor and in the Sierra Nevada decreases from north to south. Stockton in the north receives about 20 inches of precipitation per year, Fresno in the center, receives about 10 inches per year, and Bakersfield at the southern end of the valley receives less than 6 inches per year. This is primarily because the Pacific storm track often passes through the northern part of the state while the southern part of the state remains protected by the Pacific High. Precipitation in the SJVAB is confined primarily to the winter months with some also occurring in late summer and fall. Average annual rainfall for the entire San Joaquin Valley is approximately 5 to 16 inches. Snowstorms, hailstorms, and ice storms occur infrequently in the San Joaquin Valley and severe occurrences of any of these are very rare.

The winds and unstable air conditions experienced during the passage of storms result in periods of low pollutant concentrations and excellent visibility. Between winter storms, high pressure and light winds allow cold moist air to pool on the San Joaquin Valley floor. This creates strong low-level temperature inversions and very stable air conditions. This situation leads to the San Joaquin Valley's famous Tule Fogs. The formation of natural fog is caused by local cooling of the atmosphere until it is saturated (dew point temperature). This type of fog, known as radiation fog is more likely to occur inland. Cooling may also be accomplished by heat radiation losses or by horizontal movement of a mass of air over a colder surface. This second type of fog, known as advection fog, generally occurs along the coast.

Conditions favorable to fog formation are also conditions favorable to high concentrations of CO and PM-10. Ozone levels are low during these periods because of the lack of sunlight to drive the photochemical reaction. Maximum CO concentrations tend to occur on clear, cold nights when a strong surface inversion is present and large numbers of fireplaces are in use. A secondary peak in CO concentrations occurs during morning commute hours when a large number of motorists are on the road and the surface inversion has not yet broken.

The water droplets in fog, however, can act as a sink for CO and nitrogen oxides (NOx), lowering pollutant concentrations. At the same time, fog could help in the formation of secondary particulates such as ammonium sulfate. These secondary particulates are believed to be a significant contributor of winter season violations of the PM-10 and PM-2.5 standards.

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 contributed 34 percent, while other mobile vehicles, such as trains, planes, and off-road vehicles, contribute another 20 percent in 2012 according to emission projections from the ARB. 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 83 percent of all NO_x emitted from anthropogenic sources based on data provided in Appendix I of the Air District's 2013 *Ozone Plan*. In addition, mobile sources contribute 22 percent of all the ROG emitted from sources within the San Joaquin Valley.

The principal factors that affect air quality in and around Madera 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 Madera 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 Madera 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 farming activities (29%) and road dust, both paved and unpaved (24%) in 2012 according to emission projections from the ARB. Fugitive windblown dust from "open" fields contributed 14 percent of the PM_{10}.

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 Madera County, including areas north and west of the San Joaquin Valley, can cause or generate emissions that are transported into Madera 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 Madera 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 Madera County consist of agricultural production and processing operations, wine production, and marketing operations.

San Joaquin Valley Air Basin Monitoring

The SJVAB consists of eight counties, from San Joaquin 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 2009 and 2012 is summarized in Tables 3-8 through 3-10.

TABLE 3-8

SJVAB Ambient Air Quality Monitoring Data Summary - Ozone 2009-2012

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
2012	72	134	*3*	105	0.135	0.14	*0.130*	0.116	0.116	0.116	0.098	0	100
2011	71	131	*3*	109	0.134	0.13	*0.130*	0.105	0.114	0.105	0.099	78	100
2010	59	115	*7*	93	0.140	0.14	*0.140*	0.115	0.122	0.114	0.104	70	100
2009	82	122	*4*	98	0.135	0.14	*0.140*	0.110	0.124	0.110	0.105	0	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.
Source: California Air Resources Board (ADAM) Air Pollution Summaries.

TABLE 3-9

SJVAB Ambient Air Quality Monitoring Data Summary - PM 2.5 2009-2012

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
2012	29.4	16.0	17.9	16.0	18	93.4	71	93.4	93.4	29	100
2011	39.3	20.4	18.1	18.2	21	69.5	62	80.3	82.8	34	100
2010	28.7	17.9	17.2	21.2	21	56.2	65	107.8	112.0	10	100
2009	50.5	22.5	21.2	22.6	25	66.7	70	195.5	195.5	14	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] = National Design Value.
D.V.[2] = State Designation Value.
Source: California Air Resources Board (ADAM) Air Pollution Summaries.

TABLE 3-10
SJVAB Ambient Air Quality Monitoring Data Summary - PM 10 2009-2012

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
2012	0.0	89.4	45.1	41.4	38	44	138.6	125.8	100
2011	0.0	116.4	44.8	44.2	41	47	151.8	154.0	100
2010	1.0	67.4	43.5	35.0	46	56	235.6	238.0	100
2009	1.9	123.4	57.5	46.5	57	56	423.8	139.5	100

Notes:

All concentrations expressed in parts per million.

The national annual average PM10 standard was revoked in December 2006 and is no longer in effect. Statistics related to the revoked standard are shown in *italics*.

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.

State statistics for 1998 and later are based on *local* conditions (except for sites in the South Coast Air Basin, Where State statistics for 2002 and later are based on *local* conditions). 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.

Source: California Air Resources Board (ADAM) Air Pollution Summaries.

Tables 3-11 and 3-12 reflect the ambient air quality classifications for monitoring sites in Madera County. Table 3-13 identifies Madera County's attainment status, which can be located on the District's website at: valleyair.org/aqinfo/attainment.htm. As indicated, Madera County is nonattainment for Ozone (1 hour and 8 hour) and PM under the State standard. In accordance with the FCAA, 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 FCAA 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.

TABLE 3-11
Maximum Pollutant Levels at Madera's 28261 Avenue 14 Monitoring Station

Pollutant	Time Averaging	2010 Maximums	2011 Maximums	2012 Maximums	Standards National	Standards State
Ozone (O_3)	1 hour	0.120 ppm	0.095 ppm	0.120 ppm	-	0.09 ppm
Ozone (O_3)	8 hour	0.107 ppm	0.085 ppm	0.105 ppm	0.075 ppm	0.070 ppm
Carbon Monoxide (CO)[a]	8 hour	2.03 ppm	2.29 ppm	2.22 ppm	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO_2)[b]	1 hour	48.0 ppb	43.0 ppb	48.0 ppb	100 ppb	0.18 ppm
Nitrogen Dioxide (NO_2)[b]	Annual Average	8.0 ppb	8.0 ppb	*	0.053 ppm	0.030 ppm
Particulates (PM_{10})	24 hour	111.9 µg/m3	118.8 µg/m3	115.3 µg/m3	150 µg/m^3	50 µg/m^3
Particulates (PM_{10})	Federal Annual Arithmetic Mean	26.9 µg/m3	31.2 µg/m3	36.3 µg/m3	-	20 µg/m3
Particulates ($PM_{2.5}$)	24 hour	62.7 µg/m3	71.2 µg/m3	58.8 µg/m3	35 µg/m3	-
Particulates ($PM_{2.5}$)	Federal Annual Arithmetic Mean	*	20.4 µg/m3	15.9 µg/m3	12 µg/m3	12 µg/m3

Source: CARB Website, 2014

* Means there was insufficient data available to determine the value.

a: Fresno's First Street Monitoring Station

b: Madera's Pump Yard Monitoring Station

TABLE 3-12
Maximum Pollutant Levels at Madera's Pump Yard Monitoring Station

Pollutant	Time Averaging	2010 Maximums	2011 Maximums	2012 Maximums	Standards National	Standards State
Ozone (O_3)	1 hour	0.110 ppm	0.098 ppm	0.107 ppm	-	0.09 ppm
Ozone (O_3)	8 hour	0.096 ppm	0.085 ppm	0.092 ppm	0.075 ppm	0.070 ppm
Carbon Monoxide (CO)[a]	8 hour	2.03 ppm	2.29 ppm	2.22 ppm	9.0 ppm	9.0 ppm
Nitrogen Dioxide (NO_2)	1 hour	48.0 ppb	43.0 ppb	48.0 ppb	100 ppb	0.18 ppm
Nitrogen Dioxide (NO_2)	Annual Average	8.0 ppb	8.0 ppb	*	0.053 ppm	0.030 ppm
Particulates (PM_{10})[b]	24 hour	111.9 µg/m3	118.8 µg/m3	115.3 µg/m3	150 µg/m3	50 µg/m3
Particulates (PM_{10})[b]	Federal Annual Arithmetic Mean	26.9 µg/m3	31.2 µg/m3	36.3 µg/m3	-	20 µg/m3
Particulates ($PM_{2.5}$)[b]	24 hour	62.7 µg/m3	71.2 µg/m3	58.8 µg/m3	35 µg/m3	-
Particulates ($PM_{2.5}$)[b]	Federal Annual Arithmetic Mean	*	20.4 µg/m3	15.9 µg/m3	12 µg/m3	12 µg/m3

Source: CARB Website, 2014

* Means there was insufficient data available to determine the value.

a: Fresno's First Street Monitoring Station

b: Madera's 28261 Avenue 14 Monitoring Station

TABLE 3-13
Madera County Attainment Status

Pollutant	Designation/Classification	
	Federal Standards	State Standards
Ozone - 1 Hour	Revoked in 2005	Nonattainment/Severe
Ozone - 8 Hour	Nonattainment/Extreme [a]	Nonattainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
Carbon Monoxide	Unclassified/Attainment	Unclassified/Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead (Particulate)	No Designation/Classification	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

Source: CARB Website, 2014

a. Though the Valley was initially classified as serious nonattainment for the 1997 8-hour ozone standard, EPA approved Valley reclassification to extreme nonattainment in the Federal Register on May 5, 2010 (effective June 4, 2010).

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.

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.

Air Quality Standards

The FCAA, 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 CCAA (State 1988 Statutes, Chapter 568), which set forth a program for achieving more stringent California Ambient Air Quality Standards. The ARB implements State ambient air quality standards, as required in the CCAA, and cooperates with the federal government in implementing pertinent sections of the FCAA 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 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 the 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 Madera 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), NOx, and sunlight. ROG and NOx are emitted from various sources throughout Madera 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 NOx 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 ARB found ozone standards in Madera County nonattainment of 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 District's 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 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. The 2008 PM2.5 Plan for the 1997 PM2.5 standard (as revised in 2011) was approved by EPA on November 9, 2011, which contains motor vehicle emission budgets for PM2.5 and NOx established based on average annual daily emissions, as well as a trading mechanism. The motor vehicle emissions budget for PM2.5 includes directly emitted PM2.5 motor vehicle emissions from tailpipe, brake wear and tire wear. VOC, SOx, ammonia, and dust (from paved roads, unpaved roads, and road construction) were found to be insignificant and not included in the motor vehicle emission budgets for conformity purposes.

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 ARB found PM_{10} standards in Madera County in attainment of Federal standards and nonattainment for State standards. The ARB found $PM_{2.5}$ standards in Madera County nonattainment of 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 ARB found CO standards in Madera County in attainment of Federal standards and unclassified for State 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 ARB found NO_2 standards in Madera County in attainment of 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 ARB found SO_2 standards in Madera County as unclassified for Federal standards and attainment for State standards.

- ✓ **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 ARB found Lead standards in Madera County in attainment of Federal and 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. The ten TACs are acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (diesel PM). Caltrans' guidance for transportation studies references the Federal Highway Administration (FHWA) memorandum titled "Interim Guidance on Air Toxic Analysis in NEPA Documents" which discusses emissions quantification of six "priority" compounds of 21 Mobile Source Air Toxics (MSAT) identified by the US EPA. The six diesel exhaust (particulate matter and organic gases), benzene, 1,3-butadiene, acetaldehyde, formaldehyde, and acrolein.

Some studies indicate that diesel PM poses the greatest health risk among the TACs listed above. A 10-year research program (California Air Resources Board 1998) demonstrated that diesel PM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to diesel PM poses a chronic health risk. In addition to increasing the risk of lung cancer, exposure to diesel exhaust can have other health effects. Diesel exhaust can irritate the eyes, nose, throat, and lungs, and it can cause coughs, headaches, lightheadedness, and nausea. Diesel exhaust is a major source of fine particulate pollution as well, and studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems.

Diesel PM differs from other TACs in that it is not a single substance but a complex mixture of hundreds of substances. Although diesel PM is emitted by diesel-fueled, internal combustion engines, the composition of the emissions varies, depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present. Unlike the other TACs, however, no ambient monitoring data are available for diesel PM because no routine measurement method currently exists. The ARB has made preliminary concentration estimates based on a diesel PM exposure method. This method uses the ARB emissions inventory's PM10 database, ambient PM10 monitoring data, and the results from several studies to estimate concentrations of diesel PM. Table 3-14 depicts the ARB Handbook's recommended buffer distances associated with various types of common sources.

Existing air quality concerns within Madera 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.

TABLE 3-14
Recommendations on Siting New Sensitive Land Uses Such As Residences, Schools, Daycare Centers, Playgrounds, or Medical Facilities*

SOURCE CATEGORY	ADVISORY RECOMMENDATIONS
Freeways and High-Traffic Roads	- Avoid siting new sensitive land uses within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day.
Distribution Centers	- Avoid siting new sensitive land uses within 1,000 feet of a distribution center (that accommodates more than 100 trucks per day, more than 40 trucks with operating transport refrigeration units (TRUs) per day, or where TRU unit operations exceed 300 hours per week). - Take into account the configuration of existing distribution centers and avoid locating residences and other new sensitive land uses near entry and exit points.
Rail Yards	- Avoid siting new sensitive land uses within 1,000 feet of a major service and maintenance rail yard. - Within one mile of a rail yard, consider possible siting limitations and mitigation approaches.
Ports	- Avoid siting of new sensitive land uses immediately downwind of ports in the most heavily impacted zones. Consult local air districts or the ARB on the status of pending analyses of health risks.
Refineries	- Avoid siting new sensitive land uses immediately downwind of petroleum refineries. Consult with local air districts and other local agencies to determine an appropriate separation.
Chrome Platers	- Avoid siting new sensitive land uses within 1,000 feet of a chrome plater.
Dry Cleaners Using Perchloroethylene	- Avoid siting new sensitive land uses within 300 feet of any dry cleaning operation. For operations with two or more machines, provide 500 feet. For operations with 3 or more machines, consult with the local air district. - Do not site new sensitive land uses in the same building with perchloroethylene dry cleaning operations.
Gasoline Dispensing Facilities	- Avoid siting new sensitive land uses within 300 feet of a large gas station (defined as a facility with a throughput of 3.6 million gallons per year or greater). A 50 foot separation is recommended for typical gas dispensing facilities.

*Notes:
• These recommendations are advisory. Land use agencies have to balance other considerations, including housing and transportation needs, economic development priorities, and other quality of life issues.
• Recommendations are based primarily on data showing that the air pollution exposures addressed here (i.e., localized) can be reduced as much as 80% with the recommended separation.
• The relative risk for these categories varies greatly (see Table 1-2). To determine the actual risk near a particular facility, a site-specific analysis would be required. Risk from diesel PM will decrease over time as cleaner technology phases in.
• These recommendations are designed to fill a gap where information about existing facilities may not be readily available and are not designed to substitute for more specific information if it exists. The recommended distances take into account other factors in addition to available health risk data (see individual category descriptions).
• Site-specific project design improvements may help reduce air pollution exposures and should also be considered when siting new sensitive land uses.
• This table does not imply that mixed residential and commercial development in general is incompatible. Rather it focuses on known problems like dry cleaners using perchloroethylene that can be addressed with reasonable preventative actions.
• A summary of the basis for the distance recommendations can be found in the ARB Handbook: Air Quality and Land Use Handbook: A Community Health Perspective.

Source: SJVAPCD 2014

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.

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD District has identified some common types of facilities that have been known to produce odors in the SJV Air Basin. The types of facilities that are known to produce odors are shown in Table 3-15 along with a reasonable distance from the source within which, the degree of odors could possibly be significant. Information presented in Table 3-15 will be used as a screening level of analysis for potential odor sources for the proposed project.

✓ **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

The FCAA defines a TCM as including, but not limited to: programs for improved public transit; high occupancy vehicle lanes; employer-based transportation management plans; trip reduction ordinances; traffic flow improvements; park-a-ride lots; programs to restrict vehicle use during peak periods; rideshare services; bicycle and pedestrian programs; programs to control vehicle idling; flexible work schedules; programs and ordinances to facilitate non-automobile travel; and programs to encourage the voluntary removal of pre-1980 light duty vehicles and trucks. Best available control measures (BACM) are an example of a transportation control measure.

TABLE 3-15
Screening Levels for Potential Odor Sources

Type of Facility	Distance
Wastewater Treatment Facilities	2 miles
Sanitary Landfill	1 mile
Transfer Station	1 mile
Compositing Facility	1 mile
Petroleum Refinery	2 miles
Asphalt Batch Plant	1 mile
Chemical Manufacturing	1 mile
Fiberglass Manufacturing	1 mile
Painting/Coating Operations (e.g. auto body shops)	1 mile
Food Processing Facility	1 mile
Feed Lot/Dairy	1 mile
Rendering Plant	1 mile

Source: SJVAPCD 2014

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 2014 RTP and SCS and the Federal Transportation Improvement Program (FTIP), which was adopted on September 21, 2016. 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.

Madera County and its two 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 Madera County and is administered by MCTC. It also provides ride matching within the four counties of Fresno, Kings, Madera, and Tulare.[1] A complete description of the current air quality requirements is provided in the 2014 RTP/SCS and the latest Air Quality

[1] MCTC – 2014 Regional Transportation Plan (RTP)

Conformity Findings for the 2014 RTP/SCS and 2017 Federal Transportation Improvement Program (FTIP) are on file at MCTC and on its website at www.maderactc.org.

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 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 2014 RTP Air Quality Conformity Determination. The 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.

Environmental Impacts, Mitigation Measures, and Significance after Mitigation

Methodology

This section analyzes the air quality impacts associated with the implementation of MCTC's 2014 RTP. This analysis evaluates each significance criterion individually, assessing how implementation of MCTC's 2014 RTP and SCS, including changes to the land use pattern and transportation network, may impact the air quality in the Madera County region. The analysis for each significance criteria includes a discussion of program-level impacts for the planning horizon year of 2040. Appropriate mitigation measures are applied where a significant impact has been determined.

Criteria of Significance

According to the CEQA, a project will normally have a significant adverse impact on air quality if it will "violate any ambient air quality standard, conflict with or obstruct implementation of an applicable air quality plan, result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment, create substantial objectionable odors, contribute substantially to an existing or projected air quality violation, or expose sensitive receptors to substantial pollutant concentrations."

An impact is considered significant if one or more of the following conditions occur from implementation of MCTC's 2014 RTP:

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

Impact 3.4.1 – Conflict with or obstruct implementation of an applicable air quality plan

The following analysis is a summary of the Conformity Analysis for the 2017 FTIP and the 2014 RTP and SCS. The complete Air Quality Conformity Analysis is included in the 2014 RTP and SCS Appendices.

- ✓ **Madera 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 and SCS 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 2014 RTP and SCS 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." As Table 3-16 below shows, 2017, 2020, and 2023 are “budget years" and 2031 is the year of attainment. As described above, Ozone emissions for the 2023, 2031, and 2040 analysis years must be less than or equal to the 2017 "budget" to demonstrate compliance with the SJVAPCD 2008 Ozone Plan.

TABLE 3-16
San Joaquin Valley Conformity Analysis Years

Pollutant	Budget Years[1]	Attainment/ Maintenance Year	Intermediate Years	RTP Horizon Year
Ozone	2017/2020 /2023	2031	N/A	2040
PM10	N/A	2020	2025/2035	2040
PM2.5	N/A	2014	2017/2025/2035	2040

1 Budget years that are not in the time frame of the transportation plan are not included as analysis years (e.g., Ozone 2008, PM10 2005, PM2.5 2009), although they may be used to demonstrate conformity.

Source: San Joaquin Valley Air Pollution Control District, 2014

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 for the 1997 NAAQS is 2014(2015- This is the year that was included in the text correction 'comments' we received on the previous report) based on data from 2012-2014. The attainment year for the 2006 NAAQS is 2017(2015- This is the year that was included in the text correction 'comments' we received on the previous report) based on data from 2013-2017(2015). 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 2017.

- **Ozone Precursors**

  The regional emissions analysis and forecasts for ozone precursors (ROG and NO_X) are summarized in Table 3-17. The summary of emissions forecasts is derived from outputs of the EMFAC 2014 model performed by MCTC 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.

- **Particulate Matter**

  The regional emissions analysis and forecasts for particulate matter (PM_{10} and $PM_{2.5}$) are summarized in Table 3-17. The summary of emissions forecasts is derived from outputs of the EMFAC 2014 model performed by MCTC 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 2014 RTP are measured.

✓ **Results of the Conformity Analysis**

A regional emissions analysis was conducted for the years referenced in Table 3-17 above for each applicable pollutant. All analyses were conducted using the latest planning assumptions and emissions models. The major conclusions of the MCTC Conformity Analysis are:

- For ozone, the total regional on-road vehicle-related emissions (ROG and NO_X) associated with implementation of the 2017 FTIP and the 2014 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 2017 FTIP and the 2014 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 2017 FTIP and the 2014 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 2017 FTIP and the 2014 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 SJVAPCD 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 3-17

Conformity Results for RTP Projects – 2017 Conformity Results Summary

Pollutant	Scerio	Emissions Total		DID YOU PASS?	
		ROG (tons/day)	NOx (tons/day)	ROG	NOx
Ozone	2017 Budget	2.0	5.5		
	2017	1.8	5.0	YES	YES
	2020 Budget	1.6	4.5		
	2020	1.3	4.0	YES	YES
	2023 Budget	1.3	2.7		
	2023	1.1	2.3	YES	YES
	2031	0.7	1.7	YES	YES
	2040	0.5	1.5	YES	YES
PM-10		PM-10 (tons/day)	NOx (tons/day)	PM-10	NOx
	2020 Budget	2.5	4.7		
	2020	1.6	4.2	YES	YES
	2020 Budget	2.5	4.7		
	2025	1.6	2.2	YES	YES
	2020 Budget	2.5	4.7		
	2035	1.9	1.7	YES	YES
	2020 Budget	2.5	4.7		
	2040	1.7	1.6	YES	YES
1997 24-Hour and 1997 & 2012 Annual PM2.5 Standards		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
	2014 Budget	0.3	8.1		
	2017	0.2	5.3	YES	YES
	2014 Budget	0.3	8.1		
	2018	0.2	4.8	YES	YES
	2014 Budget	0.3	8.1		
	2021	0.1	3.8	YES	YES
	2014 Budget	0.3	8.1		
	2025	0.1	2.2	YES	YES
	2014 Budget	0.3	8.1		
	2035	0.1	1.7	YES	YES
	2014 Budget	0.3	8.1		
	2040	0.1	1.6	YES	YES
2006 PM2.5 Winter 24-Hour Standard		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
	2017 Budget	0.2	6.0		
	2017	0.2	5.5	YES	YES
	2017 Budget	0.2	6.0		
	2019	0.2	4.7	YES	YES
	2017 Budget	0.2	6.0		
	2025	0.1	2.3	YES	YES
	2017 Budget	0.2	6.0		
	2035	0.1	1.7	YES	YES
	2017 Budget	0.2	6.0		
	2040	0.1	1.6	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 2014 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 2014 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 2014 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 as shown in Table 3-16. These years are described as "budget" years because each of these SJVAPCD plans identifies motor vehicle emission "budgets" in which 2014 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 2040, PM10 emissions equal 1.7 tons per day and NOx emissions equal 1.6 tons per day. Because 2040 NOx emissions are less than the 2020 NOx emissions "budget" (4.7 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 2014 RTP. In 2040, the difference between the 2020 NOx budget and the 2040 NOx emissions is 3.1 tons per day. The 2020 NOx budget is a "not to exceed" number from the SIP, while the 2040 value is an actual modeled estimate. Emission trading as approved in the PM10 Plan utilizes a 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 likely, PM10 emissions resulting from the presence of the PM 10 precursor NOx will not form in 2040. This results in the ability to "trade" approximately 3.1 tons of NOx (which again is reflective of the difference between the 2020 "budget" and the 2040 PM10 emissions resulting from the 2014 RTP) for approximately 2.0 tons of PM10 in 2040 because the formation of PM10 emissions resulting from precursor NOx emissions has been decreased. Documentation of this can be found in the 2017 Conformity Analysis for the 2014 RTP/SCS and the 2017 FTIP approved on September 21, 2016.

Similar to the analysis documenting compliance with federal standards, the term "budget" after 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 2014 RTP are measured.

For this analysis, only on-road mobile sources are considered as the 2014 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 3-18 through 3-20, 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 2014 RTP contributes to positive progress toward the attainment of state ambient air quality standards. These tables also demonstrate that the 2014 RTP is consistent with the SJVAPCD plans, including their regulations and incentives relative to motor vehicle emissions budgets.

  Table 3-19 (PM_{10}) shows that PM_{10} emissions remain the same in 2020 and 2025, but slightly increases in 2035 before decreasing in 2040. Table 3-20 ($PM_{2.5}$) documents that $PM_{2.5}$ emissions remain the same in 2017 and 2018 before slightly decreasing in 2021 and remaining the same through 2040. It should be noted that NOx emissions decrease through 2040. In all cases the reported emissions 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. This demonstrates compliance with the state ambient air quality standards for PM_{10} and $PM_{2.5}$.

TABLE 3-18
Ozone, ROG, and NOX Emissions Test (Summer Tons per Day)

Scenario	Emissions (Tons/Day)		% Below Budget		% Reduction/Year	
	ROG	NOX	ROG	NOX	ROG	NOX
2017 Budget	**2.00**	**5.50**	**N/A**	**N/A**	**N/A**	**N/A**
2017	1.80	5.00	10.0%	9.1%	N/A	N/A
2020 Budget	**1.60**	**4.50**	**N/A**	**N/A**	**N/A**	**N/A**
2020	1.30	4.00	18.8%	11.1%	12.8%	8.3%
2023 Budget	**1.30**	**2.70**	**N/A**	**N/A**	**N/A**	**N/A**
2023	1.10	2.30	15.4%	14.8%	6.1%	24.6%
2035	0.70	1.70	46.2%	37.0%	4.8%	2.9%
2040	0.50	1.50	61.5%	44.4%	8.0%	2.7%

Source: MCTC, 2017

TABLE 3-19
PM10 Emissions (Annual Tons per Day)

Scenario	Emissions (Tons/Day)		% Below Budget		% Reduction/Year	
	PM10	NOX	PM10	NOX	PM10	NOX
2020 Budget	**2.50**	**4.70**	**N/A**	**N/A**	**N/A**	**N/A**
2020	1.60	4.20	36.0%	10.6%	N/A	N/A
2025	1.60	2.20	36.0%	53.2%	0.0%	18.2%
2035	1.90	1.70	24.0%	63.8%	+ 1.6%	2.9%
2040	1.70	1.60	32.0%	66.0%	2.4%	1.3%

Source: MCTC, 2017

TABLE 3-20
PM2.5 Emissions - 1997 PM2.5
24-Hour & Annual Standards and 2006 24-Hour Standard

Scenario	Emissions (Tons/Day)		% Below Budget		% Reduction/Year	
	PM2.5	NOX	PM2.5	NOX	PM2.5	NOX
2014 Budget	**0.30**	**8.10**	**N/A**	**N/A**	**N/A**	**N/A**
2017	0.20	5.30	33.3%	34.6%	N/A	N/A
2018	0.20	4.80	33.3%	40.7%	0.0%	10.4%
2021	0.10	3.80	66.7%	53.1%	33.3%	8.8%
2025	0.10	2.20	66.7%	72.8%	0.0%	18.2%
2035	0.10	1.70	66.7%	79.0%	0.0%	2.9%
2040	0.10	1.60	66.7%	80.2%	0.0%	27.5%

Source: MCTC, 2017

Emissions for criteria pollutants as a result of mobile sources from implementation of the 2014 RTP and SCS were quantified for the Year 2010 and the Year 2040 with the Project. The emissions shown in Table 3-21 account for all mobile sources within Madera County. Results of the analysis show that emissions for criteria pollutants for the Year 2040 with the Project scenario will be less than the Year 2017 scenario despite recording higher VMT. Emissions for ROG, CO, and NOX exhibit a substantial reduction of more than 50%. Emissions reductions for PM2.5 are 12% when compared to the Year 2017 Scenario. PM10 emission will slightly increase from 0.35 tons per day to 0.36 tons per day.

TABLE 3-21
Criteria Pollutant Emissions (Annual Tons per Day)

Category	2017	2040 Build (2014 RTP/SCS Scenario B)
VMT	4,966,225	6,029,666
ROG (tons/day)	1.58	0.48
CO (tons/day)	11.10	3.28
NOX (tons/day)	5.29	1.57
PM10 (tons/day)	0.35	0.36
PM2.5 (tons/day)	0.17	0.15

Source: MCTC, EMFAC 2014

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 results in compliance with the state ambient air quality standards. Based on the air quality analysis, the 2014 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 with the state ambient air quality standards for PM_{10}, $PM_{2.5}$ and Ozone. As a result, implementation of the 2014 RTP would result in a *less than significant* impact to PM10, PM2.5, and Ozone. While the 2014 RTP does contribute to an ongoing violation, it does not impede the above referenced plans and regulations.

Mitigation Measures

✓ **None required**

Significance After Mitigation

✓ **Not applicable**

Timing of Implementation

✓ **Not applicable**

Responsible Agency or Party

✓ **Not applicable**

Impact 3.4.2 – Violate any air quality standard or contribute substantially to an existing or projected air quality violation

✓ **Project Construction Impacts on Air Quality**

Short-term impacts are mainly related to the construction phase of a project and are recognized to be short in duration. Construction air quality impacts are generally attributable to dust generated by equipment and vehicles. Fugitive dust is emitted both during construction activity and as a result of wind erosion over exposed earth surfaces. Clearing and earth moving activities do comprise major sources of construction dust emissions, but traffic and general disturbances of soil surfaces also generate significant dust emissions. Further, dust generation is dependent on soil type and soil moisture. Health risks associated with dust inhalation include lung cancer, silicosis, chronic obstructive pulmonary disease, and asthma. Long-term exposure to dust is the main source to the health risks previously listed. The mitigation measures identified below are intended to minimize exposure to fugitive dust.

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 as shown in Table 3-22. 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

TABLE 3-22
SJVAPCD Air Quality Thresholds of Significance

	Ozone Precursor Emissions (tons/year)					
Project Type	CO	NO_X	ROG	SO_X	PM_{10}	$PM_{2.5}$
Short-term Effects (Construction)	100	10	10	27	15	15

Source: SJVAPCD 2014

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. The SJVAPCD's Regulation VIII is applied to all construction sites and will constitute sufficient measures to reduce air quality impacts to a level considered less-than significant. 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

The specific impacts on air quality will be evaluated as part of the implantation agencies' project-level environmental review process regarding their proposed individual transportation improvement project(s) and future land use development(s). Implementation agencies will ultimately be responsible for ensuring adherence to the mitigation measures identified prior to construction. Given that MCTC does not have land use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below.

- ✓ 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.
  - over all haul trucks.
  - Project implementation agencies will require that construction sites employ a balanced cut/fill ratio to the extent possible, thus reducing haul-truck trip emissions.

Significance After Mitigation

The responsibility to approve land use development consistent with the general plans and the SCS rests with the local jurisdictions and the responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies with jurisdiction over a project area. While implementation and monitoring of the above mitigation measures will provide the framework and direction to avoid or reduce the identified significant impacts identified, it is probable that such impacts could remain significant and unavoidable. As a program-level document, evaluation of all project-specific circumstances is not plausible. Individual projects will require a project-level analysis to determine appropriate mitigation strategies. As appropriate, MCTC will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Timing of Implementation

- ✓ **Ongoing over the life of the Plan**

Responsible Agency or Party

- **Implementing agency or project sponsor**

Impact 3.4.3 - Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Madera County is nonattainment for Ozone (1 hour and 8 hour) and PM2.5 and is a maintenance area for PM10. 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 2013 Ozone Plan, 2007 PM10 Maintenance Plan, and the 2012 PM2.5 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 results in compliance with the state ambient air quality standards. Based on the air quality analysis, the 2014 RTP conforms to the applicable SJVAPCD plans (2013 Ozone Plan, 2007 PM10 Maintenance Plan, and the 2012 PM2.5 Plan) and demonstrates progress toward attainment with the state ambient air quality standards for PM10, PM2.5 and Ozone. As a result, implementation of the 2014 RTP would result in a less than significant impact to PM10, PM2.5, and Ozone. While the 2014 RTP does contribute to an ongoing violation, it does not impede the above referenced plans and regulations.

Mitigation Measures

None required.

Significance After Mitigation

Not applicable.

Timing of Implementation

- ✓ **Not applicable**

Responsible Agency or Party

- ✓ **Not applicable**

Impact 3.4.4 - Expose sensitive receptors to substantial pollutant concentrations.

✓ **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 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***

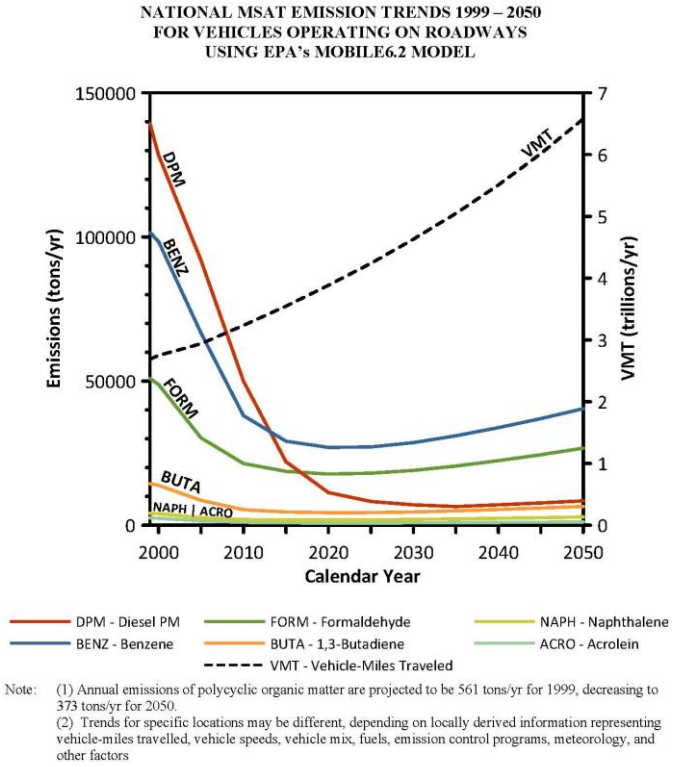
The 2007 EPA rule requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (VMT) increases by 145 percent, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in Figure 3-5 on the following page.

Local MSAT Trends (Monitoring in Madera County)

Estimation of Risk: CARB monitors toxics throughout California, including one site in Fresno County: First Street. The First Street Site in Fresno County is the closest monitoring site to Madera County. Data obtained from this monitoring site between 1989 and 2012 is shown in Tables 3-23 through 3-32. 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. The data provided in the tables below show typical cancer risk levels for sensitive receptors not located near major freeways or expressways.

Based on monitoring results in Tables 3-23 through 3-32, toxic emissions are declining except for formaldehyde. To address this issue, a mitigation measure has been added to address project level impacts.

FIGURE 3-5



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

✓ **Diesel Particulate Emissions**

Vehicle DPM emissions were estimated using emission factors for particulate matter less than 10µm in diameter (PM10) generated with the 2014 version of the Emission Factor model (EMFAC) developed by the ARB. EMFAC 2014 is a mathematical model that was developed to calculate emission rates from motor vehicles that operate on highways, freeways, and local roads in California and is commonly used by the ARB to project changes in future emissions from on-road mobile sources. The most recent version of this model, EMFAC 2014, incorporates regional motor vehicle data, information and estimates regarding the distribution of vehicle miles traveled (VMT) by speed, and number of starts per day.

The most important improvement in EMFAC 2014 is the integration of the new data and methods to estimate emissions from diesel trucks and buses. EMFAC 2014 uses the same diesel truck and bus vehicle populations, miles traveled and other emissions-related factors developed for the Truck and Bus Rule approved by the Air Resources Board in 2010. The model includes the emissions benefits of the truck and bus rule and the previously adopted rules for other on-road diesel equipment. Finally, the impacts of the recession on emissions that were quantified as part of the truck and bus rulemaking are included.

Several distinct emission processes are included in EMFAC 2014. Emission factors calculated using EMFAC 2014 are expressed in units of grams per vehicle miles traveled (g/VMT) or grams per idle-hour (g/idle-hour), depending on the emission process. The emission processes and corresponding emission factor units associated with diesel particulate exhaust for this Project are presented below.

For this Project, annual average PM10 emission factors were generated by running EMFAC 2014 in EMFAC Mode for vehicles in Madera County. The EMFAC Model generates emission factors in terms of grams of pollutant emitted per vehicle activity and can calculate a matrix of emission factors at specific values of temperature, relative humidity, and vehicle speed. The model was run for speeds traveled along SR 41, SR 145, and SR 152, within Madera County. The vehicle travel speeds for each segment was estimated to be 55 miles per hour.

PM10 emissions were calculated at 20,000 and 25,000 ADT for all three segments discussed above. The highest truck percentage along each respective route was applied to the ADT volumes and provides a conservative estimate for PM10 emissions along any point along the route. The truck percentages were determined from Caltrans' count book. The highest truck percentages for SR 41, SR 145, and SR 152 are 9%, 9%, and 24%, respectively.

Tables 3-33 through 3-38 show the estimated emissions for the diesel operated vehicles that travel along SR 41, SR 145, and SR 152. For purposes of this analysis, a half-mile segment of each freeway was evaluated for health risk impacts to sensitive receptors located 500 feet from the freeway segment. CARB recommends that new sensitive receptors should not be sited within 500 feet of a freeway. Results of the analysis show that PM10 emissions for the Project (2014 RTP and SCS) are anticipated to be less than the PM10 emissions for the 2010 Base Year despite the increase in average daily truck trips. Though average daily truck trips increase, diesel exhaust emissions are expected to decrease as new technologies become available.

TABLE 3-23
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
2012[a]	0.02	0.02	0.047	0.14	0.18	0.049	29	0.04	18
2011	0.02	0.02	0.072	0.20	0.25	0.075	30	0.04	27
2010	0.02	0.02	0.059	0.16	0.21	0.060	30	0.04	22
2009	0.02	0.02	0.084	0.26	0.34	0.097	32	0.04	32
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	0.30	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	0.30	0.58	0.151	31	0.04	48
2002	0.02	0.07	0.194	0.47	1.00	0.225	31	0.04	73
2001	0.02	0.10	0.182	0.42	0.90	0.226	30	0.04	68
2000	0.02	0.09	0.195	0.62	1.00	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	1.00	0.295	31	0.04	100
1997	0.02	0.14	0.233	0.71	1.00	0.268	31	0.04	87
1996	0.02	0.13	0.234	0.49	1.00	0.230	31	0.04	88
1995	0.02	0.17	0.300	0.78	1.40	0.340	30	0.04	113
1994	0.02	0.22	0.356	0.79	1.80	0.380	31	0.04	134
1993	0.02	0.20	0.342	0.84	1.40	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	1.70	0.509	30	0.04	173
1990	0.02	0.14	*	1.04	1.60	0.466	24	0.04	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014

[a] Fresno's Garland Monitoring Station

* Means there was insufficient or no data available to determine the value

TABLE 3-24
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
2012[a]	0.08	0.20	0.260	0.53	0.8	0.184	29	0.05	24
2011	0.06	0.21	0.314	0.76	1.2	0.299	30	0.05	29
2010	0.05	0.23	0.260	0.58	0.7	0.195	30	0.05	24
2009	0.05	0.21	0.344	0.81	1.2	0.325	32	0.05	32
2008	0.09	0.24	0.356	0.72	1.0	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	1.00	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	0.350	30	0.05	37
2003	0.10	0.31	0.546	1.20	1.8	0.498	31	0.05	51
2002	0.08	0.27	0.631	1.50	2.2	0.574	31	0.05	58
2001	0.08	0.40	0.610	1.26	3.1	0.672	30	0.05	56
2000	0.10	0.50	0.730	1.90	3.1	0.860	30	0.20	68
1999	0.10	0.50	0.800	1.70	2.9	0.730	31	0.20	74
1998	0.10	0.50	0.830	2.30	2.8	0.830	31	0.20	76
1997	0.10	0.50	1.000	2.40	5.8	1.190	31	0.20	92
1996	0.25	0.25	0.790	1.50	3.1	0.700	33	0.50	73
1995	0.25	1.00	1.240	2.40	4.5	1.110	30	0.50	115
1994	0.25	1.00	1.440	3.10	7.6	1.550	31	0.50	133
1993	0.25	1.20	1.350	3.60	4.4	1.260	30	0.50	125
1992	0.25	1.00	1.340	2.80	3.8	1.050	30	0.50	124
1991	0.25	1.60	2.420	5.40	7.3	2.040	30	0.50	224
1990	0.25	1.30	*	5.20	5.4	1.780	24	0.50	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014

[a] Fresno's Garland Monitoring Station

* Means there was insufficient or no data available to determine the value

TABLE 3-25
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
2012[a]	0.70	2.9	3.34	6.4	9.2	2.30	30	0.1	25
2011	0.60	2.7	3.34	5.8	11.0	2.26	31	0.1	25
2010	0.30	2.5	3.01	5.7	9.7	2.23	29	0.1	22
2009	0.05	1.8	2.56	5.2	7.5	1.89	31	0.1	19
2008	0.70	2.9	3.13	5.1	6.8	1.65	30	0.1	23
2007	0.60	2.8	2.88	4.8	7.9	1.53	30	0.1	21
2006	0.60	3.2	3.41	5.5	8.8	1.90	31	0.1	25
2005	0.70	2.5	3.00	6.0	6.9	1.88	33	0.1	22
2004	1.00	2.2	2.57	3.9	5.0	1.15	31	0.1	19
2003	0.70	3.9	3.72	6.0	8.0	1.94	33	0.1	27
2002	1.10	3.5	4.16	5.6	18.0	3.20	32	0.1	31
2001	1.20	3.3	4.32	5.4	26.0	4.43	30	0.1	32
2000	0.90	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	0.90	3.6	*	5.6	6.4	1.47	18	0.1	*
1996	0.50	3.4	*	7.8	8.4	2.26	22	0.1	*
1995	0.40	2.3	2.41	4.1	8.3	1.79	31	0.1	18
1994	0.20	1.8	2.01	4.0	7.4	1.61	31	0.1	15
1993	0.60	1.3	1.64	3.4	4.5	1.16	26	0.1	12
1992	0.50	1.5	*	4.3	5.3	1.57	21	0.1	*
1991	0.40	1.9	2.32	4.9	7.7	1.88	27	0.1	17
1990	0.05	1.3	*	5.4	9.0	2.32	23	0.1	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014

[a] Fresno's Garland Monitoring Station

* Means there was insufficient or no data available to determine the value

TABLE 3-26
City of Fresno – First Street Monitoring Site
(Acrolein Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit
2012[a]	0.30	0.6	0.77	1.1	2.7	0.54	28	0.3
2011	0.30	0.7	1.13	3.2	4.6	1.19	30	0.3
2010	0.15	0.6	0.64	0.8	3.5	0.57	30	0.3
2009	0.15	0.7	0.74	0.9	1.9	0.35	32	0.3
2008	0.40	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, 2014

[a] Fresno's Garland Monitoring Station

* Means there was insufficient or no data available to determine the value

TABLE 3-27
City of Fresno – First Street Monitoring Site
(Benzo(a)pyrene-10 Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.130	*	*	*	0.63	0.198	5	0.05	*
2004	0.025	0.025	0.210	0.63	2.00	0.415	30	0.05	0.20
2003	0.025	0.025	0.414	1.20	2.90	0.795	31	0.05	0.50
2002	0.025	0.025	0.466	1.52	2.70	0.729	30	0.05	0.50
2001	0.025	0.110	0.501	1.00	4.30	1.100	31	0.05	0.60
2000	0.025	0.025	0.491	1.15	4.60	1.080	30	0.05	0.50
1999	0.025	0.025	0.533	2.02	4.10	1.100	30	0.05	0.60
1998	0.025	0.060	0.618	2.40	4.30	1.180	31	0.05	0.70
1997	0.025	0.060	0.562	1.59	4.60	1.040	30	0.05	0.60
1996	0.025	0.025	0.515	2.60	3.00	1.020	24	0.05	0.60
1995	0.025	0.100	0.533	1.21	3.60	0.964	24	0.05	0.60
1994	0.025	0.510	*	2.61	5.50	1.500	14	0.05	*
1993	0.025	0.100	1.240	4.17	6.20	1.930	24	0.05	1.00
1992	0.025	0.080	0.624	2.19	4.70	1.180	24	0.05	0.70
1991	0.025	0.180	0.885	3.81	4.80	1.530	24	0.05	1.00
1990	0.025	0.070	*	1.52	23.00	5.380	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014
* Means there was insufficient or no data available to determine the value

TABLE 3-28
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	0.220	*	*	*	0.63	0.159	5	0.05	*
2004	0.025	0.025	0.258	0.81	2.30	0.469	30	0.05	0.03
2003	0.025	0.070	0.436	1.10	3.00	0.732	31	0.05	0.05
2002	0.025	0.025	0.508	1.31	3.00	0.774	30	0.05	0.06
2001	0.025	0.140	0.579	1.30	5.20	1.180	31	0.05	0.06
2000	0.025	0.080	0.551	1.27	4.50	1.150	30	0.05	0.06
1999	0.025	0.090	0.584	2.23	4.20	1.120	30	0.05	0.06
1998	0.025	0.120	0.621	2.40	3.80	1.010	31	0.05	0.07
1997	0.025	0.100	0.722	1.69	7.10	1.430	30	0.05	0.08
1996	0.025	0.090	0.489	2.06	2.80	0.877	24	0.05	0.05
1995	0.025	0.150	0.538	1.07	3.00	0.825	24	0.05	0.06
1994	0.100	0.770	*	3.10	5.50	1.510	14	0.05	*
1993	0.025	0.160	1.290	4.12	5.10	1.730	24	0.05	0.10
1992	0.025	0.140	0.718	2.41	5.20	1.260	24	0.05	0.08
1991	0.060	0.260	0.999	3.54	5.10	1.510	24	0.05	0.10
1990	0.050	0.150	*	1.77	22.00	5.120	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014
* Means there was insufficient or no data available to determine the value

TABLE 3-29
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	0.330	*	*	*	0.91	0.239	5	0.05
2004	0.025	0.11	0.442	1.11	3.90	0.812	30	0.05
2003	0.025	0.10	0.618	1.60	3.90	1.030	31	0.05
2002	0.025	0.11	0.629	1.92	2.80	0.815	30	0.05
2001	0.025	0.23	0.720	1.70	5.80	1.250	31	0.05
2000	0.025	0.16	0.738	1.77	5.30	1.340	30	0.05
1999	0.025	0.15	0.783	2.68	4.80	1.320	30	0.05
1998	0.025	0.26	0.718	2.20	4.10	1.110	31	0.05
1997	0.025	0.24	1.100	2.34	9.20	1.920	30	0.05
1996	0.025	0.21	0.657	2.28	3.70	1.020	24	0.05
1995	0.025	0.33	0.911	2.42	3.80	1.100	24	0.05
1994	0.270	1.40	*	4.52	6.00	1.780	14	0.05
1993	0.100	0.33	1.820	5.35	6.60	2.240	24	0.05
1992	0.025	0.23	0.904	2.75	5.20	1.360	24	0.05
1991	0.070	0.48	1.490	5.42	6.90	2.130	24	0.05
1990	0.110	*	*	*	15.00	4.960	8	0.05
1989	*	*	*	*	*	*	0	*

Source: California Air Resources Board, 2014
* Means there was insufficient or no data available to determine the value

TABLE 3-30
City of Fresno – First Street Monitoring Site
(Benzo(k)fluoranthene-10 Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.100	*	*	*	0.26	0.065	5	0.05	*
2004	0.025	0.025	0.117	0.34	1.00	0.202	30	0.05	0.01
2003	0.025	0.025	0.209	0.50	1.50	0.354	31	0.05	0.02
2002	0.025	0.025	0.227	0.64	1.30	0.333	30	0.05	0.02
2001	0.025	0.060	0.249	0.49	2.10	0.495	31	0.05	0.03
2000	0.025	0.025	0.234	0.54	1.90	0.485	30	0.05	0.03
1999	0.025	0.025	0.250	0.95	1.80	0.481	30	0.05	0.03
1998	0.025	0.025	0.266	1.10	1.60	0.452	31	0.05	0.03
1997	0.025	0.025	0.270	0.69	2.20	0.482	30	0.05	0.03
1996	0.025	0.025	0.210	0.88	1.20	0.380	24	0.05	0.02
1995	0.025	0.060	0.251	0.52	1.50	0.402	24	0.05	0.03
1994	0.025	0.310	*	1.28	2.20	0.614	14	0.05	*
1993	0.025	0.070	0.563	1.74	2.40	0.789	24	0.05	0.06
1992	0.025	0.050	0.313	1.10	2.30	0.570	24	0.05	0.03
1991	0.025	0.100	0.395	1.42	2.30	0.658	24	0.05	0.04
1990	0.025	0.025	*	0.83	9.60	2.240	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014
* Means there was insufficient or no data available to determine the value

TABLE 3-31
City of Fresno – First Street Monitoring Site
(Dibenz(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	0.10	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	0.080	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	0.050	*	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	0.060	*	*	*	6.60	2.270	8	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014
* Means there was insufficient or no data available to determine the value

TABLE 3-32
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	0.250	*	*	*	0.75	0.196	5	0.05	*
2004	0.025	0.025	0.270	0.87	2.00	0.442	30	0.05	0.03
2003	0.025	0.060	0.430	1.20	2.60	0.665	31	0.05	0.05
2002	0.025	0.025	0.515	1.31	2.80	0.766	30	0.05	0.06
2001	0.025	0.210	0.625	1.50	4.90	1.180	31	0.05	0.07
2000	0.025	0.090	0.585	1.56	4.30	1.120	30	0.05	0.06
1999	0.025	0.110	0.619	2.50	4.10	1.120	30	0.05	0.07
1998	0.025	0.160	0.698	2.70	4.00	1.090	31	0.05	0.08
1997	0.025	0.110	0.697	1.78	6.20	1.270	30	0.05	0.08
1996	0.025	0.100	0.509	2.14	2.90	0.871	24	0.05	0.06
1995	0.025	0.180	0.618	1.47	3.10	0.857	24	0.05	0.07
1994	0.130	0.790	*	2.58	4.70	1.260	14	0.05	*
1993	0.060	0.170	1.240	3.77	4.90	1.640	24	0.05	0.10
1992	0.025	0.160	0.809	2.78	5.60	1.370	24	0.05	0.09
1991	0.050	0.400	1.100	3.53	4.80	1.500	24	0.05	0.10
1990	0.025	*	*	*	26.00	8.830	8	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2014
* Means there was insufficient or no data available to determine the value

TABLE 3-33
2040 Build (2014 RTP/SCS) Mobile Source Emissions
SR 41 – 20,000 ADT

Pollutant	Vehicle Type	EMFAC Vehicle Class	Average Daily Trips (trips/day)	Total Annual Trips (trips/yr)	Trip Distance (miles)	Emission Factors [1] (gms/mile)	Emission Factors (lbs/VMT)	Annual Emissions (lbs/mile/yr)	Maximum Daily Emission Estimate (lbs/day)	Annual Average Emission Estimate (tons/yr)
PM_{10} Exhaust	State Highway Trucks	T7	1,800	657,000	0.5	0.043	9.473E-05	124.5	0.085	0.0133
							Total PM_{10} Emissions	**124.5**	**0.0853**	**0.0133**

References:
(1) Emission Factors source: EMFAC2011 for Madera County Year 2036, for speed distribution of 55 mph

TABLE 3-34
2040 Build (2014 RTP/SCS) Mobile Source Emissions
SR 41 – 25,000 ADT

Pollutant	Vehicle Type	EMFAC Vehicle Class	Average Daily Trips (trips/day)	Total Annual Trips (trips/yr)	Trip Distance (miles)	Emission Factors [1] (gms/mile)	Emission Factors (lbs/VMT)	Annual Emissions (lbs/mile/yr)	Maximum Daily Emission Estimate (lbs/day)	Annual Average Emission Estimate (tons/yr)
PM_{10} Exhaust	State Highway Trucks	T7	2,250	821,250	0.5	0.043	9.473E-05	155.6	0.107	0.0166
							Total PM_{10} Emissions	**155.6**	**0.1066**	**0.0166**

References:
(1) Emission Factors source: EMFAC2011 for Madera County Year 2036, for speed distribution of 55 mph

TABLE 3-35
2040 Build (2014 RTP/SCS) Mobile Source Emissions
SR 145 – 20,000 ADT

Pollutant	Vehicle Type	EMFAC Vehicle Class	Average Daily Trips (trips/day)	Total Annual Trips (trips/yr)	Trip Distance (miles)	Emission Factors [1] (gms/mile)	Emission Factors (lbs/VMT)	Annual Emissions (lbs/mile/yr)	Maximum Daily Emission Estimate (lbs/day)	Annual Average Emission Estimate (tons/yr)
PM_{10} Exhaust	State Highway Trucks	T7	1,800	657,000	0.5	0.043	9.473E-05	124.5	0.085	0.0133
							Total PM_{10} Emissions	**124.5**	**0.0853**	**0.0133**

References:
(1) Emission Factors source: EMFAC2011 for Madera County Year 2036, for speed distribution of 55 mph

TABLE 3-36
2040 Build (2014 RTP/SCS) Mobile Source Emissions
SR 145 – 25,000 ADT

Pollutant	Vehicle Type	EMFAC Vehicle Class	Average Daily Trips (trips/day)	Total Annual Trips (trips/yr)	Trip Distance (miles)	Emission Factors [1] (gms/mile)	Emission Factors (lbs/VMT)	Annual Emissions (lbs/mile/yr)	Maximum Daily Emission Estimate (lbs/day)	Annual Average Emission Estimate (tons/yr)
PM_{10} Exhaust	State Highway Trucks	T7	2,250	821,250	0.5	0.043	9.473E-05	155.6	0.107	0.0166
							Total PM_{10} Emissions	**155.6**	**0.1066**	**0.0166**

References:
(1) Emission Factors source: EMFAC2011 for Madera County Year 2036, for speed distribution of 55 mph

TABLE 3-37
2040 Build (2014 RTP/SCS) Mobile Source Emissions
SR 152 – 20,000 ADT

Pollutant	Vehicle Type	EMFAC Vehicle Class	Average Daily Trips (trips/day)	Total Annual Trips (trips/yr)	Trip Distance (miles)	Emission Factors [1] (gms/mile)	Emission Factors (lbs/VMT)	Annual Emissions (lbs/mile/yr)	Maximum Daily Emission Estimate (lbs/day)	Annual Average Emission Estimate (tons/yr)
PM_{10} Exhaust	State Highway Trucks	T7	4,800	1,752,000	0.5	0.043	9.473E-05	331.9	0.227	0.0355
							Total PM_{10} Emissions	**331.9**	**0.2274**	**0.0355**

References:
(1) Emission Factors source: EMFAC2011 for Madera County Year 2036, for speed distribution of 55 mph

TABLE 3-38
2040 Build (2014 RTP/SCS) Mobile Source Emissions
SR 152 – 25,000 ADT

Pollutant	Vehicle Type	EMFAC Vehicle Class	Average Daily Trips (trips/day)	Total Annual Trips (trips/yr)	Trip Distance (miles)	Emission Factors [1] (gms/mile)	Emission Factors (lbs/VMT)	Annual Emissions (lbs/mile/yr)	Maximum Daily Emission Estimate (lbs/day)	Annual Average Emission Estimate (tons/yr)
PM_{10} Exhaust	State Highway Trucks	T7	6,000	2,190,000	0.5	0.043	9.473E-05	414.9	0.284	0.0443
							Total PM_{10} Emissions	**414.9**	**0.2842**	**0.0443**

References:
(1) Emission Factors source: EMFAC2011 for Madera County Year 2036, for speed distribution of 55 mph

The modeling of emissions for this Project follows District draft guidance from the SJVAPCD. The AERMOD air dispersion model was used to estimate the dispersion of the TAC emissions from the project. Health risks for cancer risk were calculated for a variety of receptor locations. Receptors of primary interest for this analysis are those that generated the highest risk as it relates to diesel truck traffic along SR 41, SR 145, and SR 152.

The meteorological data that was used in the analysis comes from the Madera station and is published by the District. The data from the Madera station, which is located near the Madera Municipal Airport, includes five years of data from 2004 through 2008. The data from the Madera station provides the best available data for the area.

The assessment of mobile source DPM health risks followed an alternative procedure that uses AERMOD directly and bypasses HARP. The following procedure was used to assess risk for DPM:

- DPM emissions were modeled using AERMOD to determine annual average ground-level concentrations.
- Annual average DPM ground-level concentrations were then multiplied by the following factor:

$$SlopeFactor \times \frac{C_{air} \times DBR \times A \times EF \times ED \times 10^{-6}}{AT}$$

Where:
Slope Factor = 1.1
DBR = 393
A = 1
EF = 350 d/y
ED = 70 year
10^{-6} = micrograms to milligrams conversion
AT = 25,550 days

- The resultant will be the cancer risk for each source and receptor combination modeled.

The maximum predicted lifetime excess cancer risk for the modeled sensitive receptor that produced the highest risk is shown in Table 3-39. As shown, the cancer risk values are above the significance threshold of 10 in one million for the SR 152 segment with 20,000 ADT or more assuming that the highest truck percentage applies to the entire corridor. It should be noted that existing traffic counts along the SR 152 corridor has been determined to be 17,000 ADT. For SR 41 and SR 145, the cancer risk values are above the significance threshold of 10 in one million with 25,000 ADT or more assuming that the highest truck percentage applies to the entire corridor.

So for corridors with segments greater than 25,000 ADT, the cancer risk may be present. For SR 152, which has the highest truck volumes in the County, the cancer risk may be present for corridor segments with even less than 20,000 ADT dependent upon the truck percentage along a particular corridor segment. Sensitive receptors located within 500 feet of freeway segments that have a greater than 15,000 ADT are potentially at risk. It should be noted that current traffic within the City of Madera along SR 99 exceeds 60,000 ADT. Sensitive receptors located within 500 feet of SR 99 are presently at risk given the high percentage of truck traffic (21% of ADT).

TABLE 3-39
Maximum Human Health Risk Assessment Results

Scenario	Maximum Cancer Risk (in one million)		
	SR 41	SR 145	SR 152
20,000 ADT	8.7	8.7	**58.5**
25,000 ADT	**11.6**	**11.6**	**71.5**

Bold denotes exceedance of significance threshold
Source: VRPA Technologies, 2014

Diesel Particulate emissions were quantified for the Madera County portions of SR 41, SR 99, SR 145, and SR 152 to determine the impacts of diesel particulate matter (PM10 and PM2.5) on the residents of Madera County. Future projected emissions were compared to existing baseline emissions to determine if diesel particulate emissions increase over time as a result of the 2014 RTP.

The highest average daily trip (ADT) volumes from Caltrans' 2012 counts and the highest ADT projections from the MCTC model for the year 2040 (2014 RTP and SCS) for each of the corridors was used to determine the daily VMT for the SR 41, SR 99, SR 145, and SR 152 corridors within Madera County for the year 2012 and 2040. To develop a "worst case" emissions estimate, the highest percentage of truck traffic along SR 41, SR 99, SR 145, and SR 152, which was determined from Caltrans' 2012 counts, was then multiplied by the ADT volumes for the year 2012 and 2040. This yielded the average daily truck trips for the SR 41, SR 99, SR 145, and SR 152 corridors. The average daily truck trips for the year 2012 and 2040 were then multiplied by the total length of each corridor within Madera County (43 miles for SR 41, 29 miles for SR 99, 25 miles for SR 145, and 16 miles for SR 152). The resultant was the estimated daily VMT for trucks along the SR 41, SR 99, SR 145, and SR 152 corridors. This approach is deemed conservative, as all other SR 41, SR 99, SR 145, and SR 152 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 41, SR 99, SR 145, and SR 152 in Madera County.

EMFAC2014 was utilized to determine the percentage of trucks that were diesel. EMFAC2014 emissions rates were then utilized to quantify diesel particulate running exhaust emissions on the SR 41, SR 99, SR 145, and

SR 152 corridors for the year 2012 and the 2040 project scenarios. Table 3-40 shows the results of the analysis.

TABLE 3-40
Running Emissions Summary

SR 41 Diesel Emissions (tons/day)		
	2012	2040
Diesel PM10	0.0040	0.0098
Diesel PM2.5	0.0037	0.0091
VMT per day	65,790	208,314
SR 99 Diesel Emissions (tons/day)		
Diesel PM10	0.0239	0.0328
Diesel PM2.5	0.0220	0.0302
VMT per day	395,850	691,867
SR 145 Diesel Emissions (tons/day)		
Diesel PM10	0.0018	0.0037
Diesel PM2.5	0.0017	0.0033
VMT per day	29,700	77,594
SR 152 Diesel Emissions (tons/day)		
Diesel PM10	0.0039	0.0039
Diesel PM2.5	0.0036	0.0036
VMT per day	65,280	83,973

Source: VRPA, 2017

Mitigation Measure

The specific impacts on air quality will be evaluated as part of the implantation agencies' project-level environmental review process regarding their proposed individual transportation improvement project(s) and future land use development(s). Implementation agencies will ultimately be responsible for ensuring adherence to the mitigation measures identified prior to construction. Given that MCTC does not have land

use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below.

- As air toxics research continues, implementing agencies will utilize the tools and techniques that are developed for assessing health outcomes as a result of lifetime MSAT exposure. The potential health risks posed by MSAT exposure will continue to be factored into project-level decision making in the context of environmental review. Specifically, at the project level, implementing agencies shall require or perform air toxic risk assessments to determine mobile source air toxic impacts.
- Implementing agencies should require that new development install air filtration devices, as appropriate.
- Implementing agencies should require that new development consider site development constraints, such as prohibiting residential units and day care centers on the ground floor of buildings located within 500 feet of a non-elevated highway.
- Implementing agencies should require new development to reduce emissions from diesel trucks by a variety of measures, including installing electrical hook-ups at loading docks and requiring truck-intensive projects to use advanced exhaust technology.
- Implementing agencies should adhere to the Air Resources Board Handbook siting guidance and require Best Management Practices such as passive electrostatic filtering systems and the correct placement of air intakes away from toxic air contaminant sources.

Significance After Mitigation

- The responsibility to approve land use development consistent with the general plans and the SCS rests with the local jurisdictions and the responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies with jurisdiction over a project area. While implementation and monitoring of the above mitigation measures will provide the framework and direction to avoid or reduce the identified significant impacts identified, it is probable that such impacts could remain significant and unavoidable. As a program-level document, evaluation of all project-specific circumstances is not plausible. Individual projects will require a project-level analysis to determine appropriate mitigation strategies. As appropriate, MCTC will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Timing of Implementation

- ✓ **Ongoing over the life of the Plan**

Responsible Agency or Party

- **Implementing agency or project sponsor**

Impact 3.4.5 - 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 transportation improvements and future land use developments may be subject to odors typically associated with roadway construction activities (diesel exhaust, hot asphalt, etc.), and odor-generating land uses. Any odors generated by construction activities would be minor and would be short and temporary in duration. However, objectionable odors generated by future land uses; especially land uses such as landfills, wastewater treatment plants, or industrial processing facilities, may occur. This potential impact is considered ***significant*** and unavoidable.

Mitigation Measure

Implementing agencies will require assessment of new and existing odor sources for transportation improvement projects and future land use development projects to determine whether sensitive receptors would be exposed to objectionable odors and apply recommended applicable mitigation measures as defined by the applicable local air district and best practices.

Significance After Mitigation

The responsibility to approve land use development consistent with the general plans and the SCS rests with the local jurisdictions and the responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies with jurisdiction over a project area. While implementation and monitoring of the above mitigation measures will provide the framework and direction to avoid or reduce the identified significant impacts identified, it is probable that such impacts could remain significant and unavoidable. As a program-level document, evaluation of all project-specific circumstances is not plausible. Individual projects will require a project-level analysis to determine appropriate mitigation strategies. As appropriate, MCTC will encourage the implementation of the above-notated mitigation strategy intended to avoid or reduce the significant impacts identified.

Timing of Implementation

- ✓ **Ongoing over the life of the Plan**

Responsible Agency or Party

- ➢ **Implementing agency or project sponsor**

Climate Change (The section below replaces Section 3.6 Climate Change in the Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

3.6 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 (RTP and SCS) impacts.

Regulatory Setting

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).

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 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. In addition, Congress has enlarged the corporate average fuel economy (CAFE) of the U.S. automotive fleet. In August of 2012, President Barack Obama finalized groundbreaking standards that increased fuel economy to the equivalent of 54.5 mpg for cars and light-duty trucks by Model Year 2025. This rise in CAFE standards will result in a significant reduction in GHG emissions from automobiles, the largest single emitting GHG group in California.

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 (NHTSA), 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. In September of 2011, EPA and NHTSA finalized rules to reduce greenhouse gas emissions and fuel consumption for on-road heavy-duty vehicles, which were created in response to President Obama's directive to take steps to produce a new generation of clean vehicles. NHTSA's final fuel consumption standards and EPA's final carbon dioxide (CO2) emissions standards are designed for each of three regulatory categories of heavy-duty vehicles. For combination tractors the engine and vehicle standards begin in Model Year 2014 and achieve from 7 to 20% reduction in CO2 emissions and fuel consumption by Model Year 2017 over the 2010 baselines. For heavy-duty pickup trucks and vans, the standards begin in Model Year 2014 and achieve up to a 10% reduction in CO2 emissions and fuel consumption for gasoline vehicles and 15% reduction for diesel vehicles by Model Year 2018. For vocational vehicles, the engine and vehicle standards begin in Model Year 2014 and achieve up to a 10% reduction in fuel consumption and CO2 emissions by Model Year 2017.

- **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.

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 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.

Regional

- ✓ **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 GHG on global climate change, the 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 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 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 2011, CO_2 accounted for approximately 88 percent of total GHG emissions in the State (CARB, 2014);

- ✓ **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.

It has become evident that human activities are continuing to impact the earth's energy budget. Observations of atmosphere, land, oceans, and cryosphere have provided evidence of climate change which is largely the result of human activities.

The average global surface air temperatures over land and oceans have increased over the last 100 years as discussed in detail in numerous publications by the International Panel on Climate Change (IPCC), namely "Climate Change 2013, The Physical Science Basis".

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 37 to 48 million by 2040, according to the California State Department of Finance. 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 461 MMT of CO_2E GHG emissions were produced in California in 2011. CARB also found transportation to be the source of 38 percent of the State's GHG emissions, followed by industrial sources at 21 percent and electricity generation at 19 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 2000 to 2011, and is summarized in Table 3-44. 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 2000 emissions level is the sum total of sources from all sectors and categories in the inventory. The inventory is divided into seven (7) broad sectors and categories. These sectors include: agriculture; commercial and residential; electricity power; High GWP; industrial; recycling and waste; 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 3-44
State of California GHG Inventory (2000-2011)

Economic Sector	Greenhouse Gas Emissions ($MMTCO_2e$)												% of Total in 2000	% of Total in 2011	% Change in Emission	
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011			2000-2011	2010-2011
Agriculture	29.04	29.23	32.39	32.84	32.57	32.81	33.95	32.94	33.88	31.69	31.68	32.24	6.3%	7.2%	11.0%	1.8%
Commercial and Residential	43.64	43.25	43.06	42.47	43.60	42.52	43.10	43.83	44.59	44.19	45.13	45.47	9.4%	10.1%	4.2%	0.8%
Electricity Power	104.86	122.01	108.65	112.62	115.20	107.86	104.54	113.94	120.14	103.56	90.09	86.57	22.7%	19.3%	-17.4%	-3.9%
High GWP	7.11	7.12	7.25	7.87	8.53	9.25	9.86	10.50	11.48	12.45	14.15	15.17	1.54%	3.39%	113.4%	7.2%
Industrial	95.81	93.85	94.42	93.42	95.73	94.23	91.88	88.79	89.27	84.43	91.00	93.24	20.7%	20.8%	-2.7%	2.5%
Recycling and Waste	6.14	6.26	6.20	6.32	6.33	6.47	6.51	6.57	6.69	6.81	6.94	7.00	1.3%	1.6%	14.0%	0.9%
Transportation	176.29	176.65	183.86	183.55	187.21	188.94	189.34	188.97	177.16	171.57	170.61	168.42	38.1%	37.6%	-4.5%	-1.3%
Total Emissions	462.9	478.4	475.8	479.1	489.2	482.1	479.2	485.5	483.2	454.7	449.6	448.1	--	--	-3.2%	-0.3%

Source: ARB California Greenhouse Gas Inventory for 2000-2011

1. Includes equipment used in construction, mining, oil drilling, industrial and airport ground operations
2. Reflects emissions from combustion of natural gas, diesel, and lease fuel plus fugitive emissions
3. These categories are listed in the Industrial sector of ARB's GHG Emission Inventory sectors
4. This category is listed in the Electric Power sector of ARB's GHG Emission Inventory sectors

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.

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 and SB 375 will be used to assess significance with respect to GHG emissions.

SB 375 requires that MCTC and other MPOs throughout California develop RTPs that include a preferred SCS scenario that achieves GHG emission targets set forth by CARB. The emission targets set for Madera County by CARB are to achieve a 5% reduction in GHG emissions between 2005 and 2020 and a 10% reduction in GHG emissions between 2005 and 2035. The CARB SB 375 Implementation in the San Joaquin Valley document fan be obtained from the following link:

http://www.arb.ca.gov/cc/sb375/finalstaffreport_011513.pdf

The following significance criteria were used to determine the level of significance of impacts of transportation improvement projects or land uses proposed by the Project. Significance criteria were developed based on Appendix G of the State CEQA Guidelines. In general, an individual improvement project and new development project contained within the RTP and SCS would result in a significant noise impact if it:

- ✓ Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment
- ✓ Conflicts with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases

Methodology

Climate change is a significant global cumulative impact that could also have a substantial effect on the natural environment of California and Madera County. The potential contribution of the 2014 RTP to this cumulative impact is discussed below.

State action on climate change is mandated by AB 32. MCTC, 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, MCTC expects that climate change will be a key environmental consideration in future regional transportation planning. Both MCTC and responsible agencies implementing projects and future land use objectives outlined in the 2014 RTP and SCS 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 prepared the San Joaquin Valley Blueprint and have each prepared or are preparing a preferred SCS scenario for inclusion in their 2014 RTP. The Blueprint process led to a preferred land use scenario separate from the local government general plan process. The agencies also prepared a Blueprint Implementation Plan including a ToolKit that is available to local agencies throughout the Valley to use 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, it is not a methodology for program-level analysis. **Instead, the analysis used for the** 2014 RTP **quantifies GHG emissions associated with the** 2014 RTP and SCS**.**

The 2014 PEIR 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 numeric 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. MCTC analyzed CO_2 emissions and fuel-consumption impacts from on-road travel resulting from the proposed 2014 RTP and SCS. The county-wide levels of GHGs associated with on-road vehicle travel are estimated based on the population estimates adopted by MCTC in 2013. These population estimates were developed considering the economic downturn, which is a conservative approach and provides a worst-case projection of CEQA impacts.

The impact assessment for GHG emissions focuses on potential effects the Project (2014 RTP and SCS) might have on GHG emissions within the Madera Region. The assessment is not site or individual improvement project-specific but is a "regional analysis".

Impact 3.6.1 - Increased Transportation GHG Emissions May Contribute to Climate Change

The ultimate sources of increased transportation emissions in Madera County are population and employment growth, which will increase with or without projects referenced in the 2014 RTP and land use allocation represented in the SCS. MCTC does not implement land use policy in Madera 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 2014 RTP and SCS is designed to complement, rather than change, the plans adopted by the local agencies. Thus, the ultimate effect of the 2014 RTP and SCS 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.

MCTC'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 and SCS could exacerbate climate change and contribute to the significant adverse environmental effects described previously. Furthermore, increased GHG emissions associated with the proposed RTP and SCS 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 2014 RTP and SCS 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[2] and evaluating whether the actions in the 2014 RTP and SCS 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 2014 RTP and SCS 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 2014 RTP and SCS.

- ✓ **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 2014 RTP and SCS 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.

  SB 375 required CARB to develop, in consultation with MPOs, passenger vehicle greenhouse gas emissions reduction targets for 2020 and 2035. This is the first RTP Update that will be subject to SB 375. MCTC did evaluate the 2014 RTP and SCS for consistency with SB 375 draft targets for the purposes of evaluating significance for GHG emissions.

  Consistent with 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.

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

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 at 5% of the GHG emissions relative to 2005 and 10% for 2020 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 2014 Version model.

As shown in Table 3-45, the GHG emissions for 2020 and 2035 with the Project are between 12.5% (2020) and 23.5% (2035) lower than the GHG emissions level of 2005. As a result, the RTP will meet ARB per capita emission targets set pursuant to SB 375. Table 3-45 also shows that VMT decreases on a per capita basis by 9.1% in 2020 and 17.6% in 2035.

TABLE 3-45
Future VMT and GHG Emissions

Year	Pounds per Capita GHG Emissions[1]	% Change from 2005	VMT Per Capita	% Change from 2005
2005	17.0	--	18.7	--
2020	14.9	12.5%	17.0	9.1%
2035	13.0	23.5%	15.4	17.6%

1: Total CO2 Emissions
Source: MCTC, EMFAC 2014

✓ **Goods Movement:** The Goods Movement category includes the following measures in the Scoping Plan:

1. Ship Electrification at Ports (not applicable in Madera County)
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 MCTC travel demand model and EMFAC 2014. GHG emissions results for medium and heavy duty trucks can be found in Table 3-46.

TABLE 3-46
GHG Emissions[1] (Goods Movement)
(Tons/Day)

Scenario	Medium Duty Trucks	Heavy Duty Trucks	Total Emissions
2017	97	888	985
2020	100	927	1,027
2025	98	923	1,021
2035	97	941	1,038
2040	99	956	1,055

1: Total CO2 Emissions
Source: MCTC, EMFAC 2014

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 2014 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 2014 RTP and SCS 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 CARB'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 2014 RTP and SCS does not interfere with the implementation of CARB 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 SJVAPCD has been awarded Prop 1B funding for diesel engine retrofits. Emissions reductions resulting from these projects are outside the scope of the RTP and SCS

because the availability and extent of engine retrofits is a site- and project-specific issue and therefore MCTC has not assumed any reduction in potential RTP impacts as a result of potential project-level retrofits. Significant reductions as a result of this measure however, are not expected even at the project-level.

✓ ***Population Growth***

Between the Year 2010 and 2040, MCTC projects a total employment growth of 36,339 for Madera County. This will accompany an increase in population in the County of 114,286 persons between 2010 and 2040, an increase of 50 percent over the 30-year period. In 2040, the estimated total population for Madera County is 265,151 persons. Table 3-47 presents the population estimates and projections from 2010 through 2040.

TABLE 3-47
Population of Madera County (2010 – 2040)
Preferred Project

Year	Household Population	Households	Employment
2010	150,865	43,304	43,547
2020	183,176	55,766	55,188
2035	242,530	73,836	73,071
2040	265,151	80,723	79,886

Source: MCTC, 2017

GHG emissions associated with implementation of the proposed RTP and SCS are primarily related to a projected increase in Countywide VMT as a result of projected growth in the unincorporated areas of Madera County and the incorporated cities. As described previously, MCTC does not have land use authority within the County or the incorporated Cities. Therefore, MCTC's ability to mitigate for climate change impacts in this EIR and the 2014 RTP update is largely limited to Smart Growth Incentives, a focus on the SCS 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**

MCTC has used the best available information to determine whether the proposed RTP and SCS 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 2014 RTP and SCS incorporates all feasible mitigation measures, which are identified below, to reduce the impacts of the proposed project on global climate change. This PEIR also includes a requirement that RTP and SCS projects incorporate the SJVAPCD's Best Performance Standards for reducing GHG. The RTP and SCS 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 Madera County.

The measures included in the RTP and SCS 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 RTP and SCS incorporates measures such as smart growth, jobs/housing balance, and transit-oriented development, which are consistent with the Attorney General's recommendations. The mitigation measures outlined below, and the policies and action items included in the 2014 RTP and SCS and the analysis of GHG emissions from the Project, are also consistent with the 2017 Regional Transportation Guidelines prepared by the California Transportation Commission, which address *SB 375 mandates.*

✓ ***Madera County Regional Blueprint Process***

MCTC 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 Madera County Regional Blueprint identifies a preferred land use scenario and transportation system for Madera 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 MCTC 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 Madera 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 affect 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 Madera 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 Madera Regional Blueprint vision, values and guiding principles include the following: In the future, Madera 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. Madera 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.

Madera 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 MCTC preferred Blueprint growth scenario is referred to as the "Low Change" scenario because it is based on elements of several alternative growth scenarios originally developed by the MCTC Blueprint Roundtable. The Low Change scenario 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. The preferred growth scenario also discourages growth on strategic farmland and resource conservation/open space land.

The next step was 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 details current Valleywide goals and objectives, provides implementation actions to address the twelve Smart Growth Principles, and provides 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 Madera County***

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

Public transit in Madera County includes Madera Area Express fixed route and Dial-a-Ride, Madera County Connection, Eastern Madera Senior Bus, Escort Program, Chowchilla Area Transit Express, CatLinx, specialized social service transportation services, Greyhound, and taxi service.

Madera County has made significant progress in addressing many public transit needs throughout the Region. MCTC's "Unmet Transit Needs" process has determined that transit services within the Madera 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 26-year timeframe of the RTP will be funded with approximately $238.4 million in projected revenues dedicated to future public transit improvements and services.

✓ ***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.

✓ ***Alternative Base Year 2010 Analysis***

MCTC evaluated the 2014 RTP and SCS for consistency with SB 375 draft targets for the purposes of evaluating significance for GHG emissions.

Consistent with 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. However, comments on the 2014 RTP/SCS indicated that the climate change analysis should reflect a later baseline year.

The Draft GHG target for MPOs within the San Joaquin Valley were set at 5% of the GHG emissions relative to 2005 and 10% for 2020 exclusive of emission reductions expected from Pavley GHG Vehicle Standards and the LCFS. However, CO_2 emissions were projected for 2010, 2020, and 2035 using EMFAC 2014 Version model.

As shown in table below, the GHG emissions for 2020 and 2035 with the Project are between 9.7% (2020) and 21.2% (2035) lower than the GHG emissions level of 2010. As a result, the RTP will meet ARB per capita emission targets set pursuant to SB 375. The also shows that VMT decreases on a per capita basis by 7.1% in 2020 and 15.8% in 2035. Referencing the table, GHG emissions decrease between 2010 and 2035 and between 2010 and 2040. As a result, no additional impacts result using a later baseline or 2010.

TABLE 3-47a
Future VMT and GHG Emissions
Assuming 2010 Base Year

Year	Pounds per Capita GHG Emissions[1]	% Change from 2010	VMT Per Capita	% Change from 2010
2010	16.5	--	18.3	--
2020	14.9	-9.7%	17.0	-7.1%
2035	13.0	-21.2%	15.4	-15.8%
2040	12.6	-23.6%	15.0	-18.0%

1: Total CO2 Emissions
Source: MCTC, EMFAC 2014

✓ ***Human Sources of GHG Emissions***

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. Current inventory covering the years 2000 to 2011 is summarized in Table 3-44. 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.

There is no established methodology to estimate GHG emissions from planned use on a regional scale. However, using available resources, the estimated MMT of GHG emissions has been estimated in the Table 3-47b for Madera County.

TABLE 3-47b
Proposed RTP and SCS Plan Area GHG Emissions in 2010, 2020, 2035, and 2040 ($MMtCO_2e$) by Sector

SECTOR	2010	2020	2035	2040
Transportation	0.68	0.67	0.65	0.64
Electricity Generation	0.36	0.24	0.22	0.21
Residential/Commercial	0.26	0.22	0.20	0.19
Industrial	0.41	0.37	0.37	0.37
Agriculture & Forestry	0.27	0.26	0.25	0.25

Source: VRPA, MCTC

An estimate of long-term climate change impacts has also been provided even though an exact estimate of 1990 baseline GHG emissions. The results continue to indicate a significant and unavoidable impact. Implementation of the proposed RTP/SCS may potentially interfere with achievement of AB 32 goals. AB 32 calls for the State of California to reach 1990 levels of GHG emissions from all sources by the year 2020. For purposes of this analysis, 1990 levels were estimated to be 15 percent below the 2008 levels. The 2008 baseline was used as it matches the Third Edition ARB GHG inventory last updated in May 2010. A 15 percent reduction below 2008 was used as a proxy for 1990 because there is no 1990 GHG emissions data for the plan area, and the Scoping Plan states that 15 percent reduction in emissions from 2008 is an approximate estimate of 1990 levels (ARB, 2010).

GHG emissions were measured in $MMtCO_2e$ from transportation, electricity generation, residential and commercial uses, industrial operations, and agricultural and forestry lands. These sectors match the Level 1 Sectors of the Third Edition ARB GHG inventory. However, since the proposed RTP/SCS only impacts land use and transportation, the initial analysis only included emissions from the transportation, electricity generation, and residential and commercial sectors. For the region, 2008 GHG emissions totaled were estimated to be 1.957 $MMtCO_2e$. Therefore, to achieve AB 32's goals, the plan area emissions must reach 1.66 $MMtCO_2e$ by 2020. With implementation of the proposed RTP/SCS and the Scoping Plan measures, 2020 emissions are forecasted to be 1.76 $MMtCO_2e$, 6 percent higher than the target, but a total of 10 percent below 2008. The Executive Order calls for reductions in GHGs of 80 percent below 1990 levels. For Madera County, this would constitute a goal of 0.33 MMtCO2e by 2050. However, the Executive Order does not include any specific measures to achieve these reductions, and instead merely places oversight for reporting from all state agencies with CalEPA. AB 32 and the Scoping

Plan–as informed but not mandated by Executive Order #S-3-05–establish the statewide standards and implementation measures for emissions reductions applicable to regional planning agencies such as MCTC.

Since AB 32 and the Scoping Plan establish the statewide standards and implementation measures (including SB 375) for GHG emissions reductions, there is no statewide guidance on assumptions, strategies, or measures to calculate achievement of the Executive Order's aspirational goal. Nevertheless, preliminary analysis to estimate GHG emissions for 2050 for the plan area was prepared and reflected in Table 3-47c. This preliminary analysis is for informational purposes only. A BAU GHG scenario was estimated for 2050 by deriving an average annual reduction in GHGs from the proposed RTP/SCS, multiplying it by the number of years from the 2040 horizon of the plan to 2050, and adding it to 2040 GHG estimates. The result is a BAU GHG estimate for 2050 of 1.56 $MMtCO_2e$, which exceeds the estimated goal of 0.33 $MMtCO_2e$.

TABLE 3-47c
Executive Order S-3-05 Targets for RTP/SCS Plan Area
($MMtCO_2e$)

YEAR	TARGET	RTP/SCS PLAN AREA ESTIMATED EMISSIONS
2020	1.66[1]	1.76
2050	0.33[2]	1.56

1: Estimated GHG Emissions for 1990
2: 80 percent below 1990 levels
Source: VRPA, MCTC

Mitigation Measures

The specific impacts on climate change will be evaluated as part of the implantation agencies' project-level environmental review process regarding their proposed individual transportation improvement project(s) and future land use development(s). Implementation agencies will ultimately be responsible for ensuring adherence to the mitigation measures identified prior to construction. Given that MCTC does not have land use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below. In addition, a number of mitigation measures are included in Section 3.4 of the Draft PEIR to address criteria emissions.

- **Through Implementation of the Regional Blueprint and the RTP and SCS, and in coordination with implementation agencies, the following mitigation measures will result in reduced GHG emissions:**
  - Develop land use patterns, consistent with the 2024 RTP and SCS, 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 consistent with the 2014 RTP and SCS.
    - 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.

Timing of Implementation

- ✓ **Ongoing over the life of the Plan**

Responsible Agency or Party

- **Implementing agency or project sponsor**
- ✓ Intelligent Transportation
  - Develop an Intelligent Transportation Systems strategy 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.

Timing of Implementation

- ✓ **2015**

Responsible Agency or Party

- ✓ **MCTC and Responsible Agencies**

- ✓ Continue Development of a SCS Funding Program

  MCTC will continue to develop a SCS Funding Program to reduce GHG emissions from transportation projects. MCTC member agencies (the cities and the County) will be eligible to apply for the funding through a formal funding application process.

Timing of Implementation

- ✓ **2014**

Responsible Agency or Party

- ✓ **MCTC**
- ✓ MCTC will immediately form an SCS Funding Program Committee or Task Force to define the program for funding allocation. At a minimum, the task force or committee will identify the SCS Funding Program project evaluation criteria necessary to evaluate the potential of transportation and other projects to:

  - Reduce GHG and air emissions
  - Reduce VMT
  - Reduce vehicle trips
  - Reduce vehicle hours of delay and idling
  - Increase transit trips
  - Increase walkability
  - Increase bike trips
  - Support alternative modes or active transportation programs and services
  - Identify other criteria that enables the task force or committee to clearly identify reductions in GHG emissions locally or on a regional basis

Timing of Implementation

- ✓ **2014**

Responsible Agency or Party

- ✓ **MCTC**

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

  Through the Valley Planners' Network and in conjunction with key partners such as local air districts, public utility providers, area chambers of commerce and others, MCTC 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. MCTC shall continue to include information on its website that is focused on global climate change. The website shall continue to 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, and telecommuting) and other travel demand management strategies.

Timing of Implementation

- ✓ **FY 2015/16**

Responsible Agency or Party

- ✓ **MCTC**

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

  MCTC 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 Madera 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 Madera County area to advance and support innovative 'green" business

MCTC shall work closely with its member agencies to help them participate in the statewide Active Transportation Program (ATP) as well as develop a MPO-Level Active Transportation Program at MCTC.

Timing of Implementation

- ✓ **FY 2015/16**

Responsible Agency or Party

- ✓ **MCTC**

- ✓ Continue to Work with the SCS Implementation Committee

MCTC will continue to work with the RTP and SCS Roundtable as directed by the MCTC Policy Board to develop SCS implementation policies and strategies, and identify appropriate funding mechanisms. Stakeholders will be invited to attend the meetings; however, only committee members (member agencies) will have voting authority.

Timing of Implementation

- ✓ **2014-2018**

Responsible Agency or Party

- ✓ **MCTC**

- ✓ Project level environmental documents

Project level environmental documents shall analyze construction and maintenance and land use development project GHG emissions.

Timing of Implementation

- ✓ **Ongoing over the life of the Plan**

Responsible Agency or Party

- ✓ **Implementing agency or project sponsor**

Significance After Mitigation

- ✓ The responsibility to approve land use development consistent with the general plans and the SCS rests with the local jurisdictions and the responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies with jurisdiction over a project area. While implementation and monitoring of the above mitigation measures will provide the framework and direction to avoid or reduce the identified significant impacts identified, it is probable that such impacts could remain significant and unavoidable. As a program-level document, evaluation of all project-specific circumstances is not plausible. Individual projects will require a project-level analysis to determine appropriate mitigation strategies. As appropriate, MCTC will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

MCTC responds to congestion through the investment in roadway capacity increasing measures once all reasonable non-capacity measures have been employed. The 2014 RTP and SCS includes approximately $238.4 million available to transit, and $94.8 million available to other active transportation modes including non-motorized (bicycle and pedestrian), alternative-fuel vehicle projects, transit oriented infrastructure for in-fill developments, and others.

The Madera 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 served as a starting point for MCTC as they prepared the SCS in accordance with the requirements of SB 375. In developing the SCS, MCTC considered 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 utilized the best available tools and techniques to develop an SCS strategy that contributes to the State's achievement of the AB 32 GHG emission reductions.

GHG emissions for 2020 and 2035 with the Project are between 12.5% (2020) and 23.5% (2035) lower than the GHG emissions level of 2005, as indicated above. As a result, the RTP will meet ARB per capita emission targets set pursuant to SB 375. Mitigation measures that are presented above would help further reduce GHG emissions to the extent feasible considering requirements set forth in AB 32 and requirements set forth in SB 375. Such measures will also assist in the promotion and implementation of Smart Growth and sustainable planning practices by the cities and the County consistent with the SCS.

Energy (The sections below replace various paragraphs or tables in Section 3.8 Energy in the Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

Energy

The first full paragraph on page 3-201 of the certified 2014 RTP/SCS PEIR is replaced with the following paragraph to reflect updated energy impact analysis results utilizing the 2016 MCTC Transportation Model:

There are a few alternative fuel projects identified in the 2014 RFP that would assist in minimizing the Madera County's overall energy consumption. The City of Madera and Madera County seek to convert four pieces of major equipment to compressed natural gas (CNG), install two (2) electric vehicle charging stations, and purchase two electric buses and recharging stations, and purchase a zero emission vehicle. Vehicle fuel consumption was projected from a baseline year of 2010 through the RTP and SCS build out year of 2040 using the EMFAC 2014 model. Table 3-51 quantifies the projected vehicle fuel consumption in gallons per day using EMFAC data. The total fuel consumption is projected to decrease between 2010 to 2040, or over 30 years. 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.

In addition, Table 3-51 on page 3-202 of the certified 2014 RTP/SCS PEIR has been replaced with the following table. As can be seen, no additional impacts result.

TABLE 3-51
Madera County Vehicle Fuel Consumption (2012 through 2040)

	2017	2020	2035	2040
Gasoline (gal/day)	196,500	181,400	127,100	126,400
Diesel (gal/day)	98,600	101,300	98,800	100,000
Total Fuel (gal/day)	295,100	282,700	225,900	226,400
Total Fuel per capita (gal/day)	1.70	1.54	0.93	0.86

Source: MCTC, EMFAC 2014

Population, Housing and Employment (The sections below replace various paragraphs, tables or figures in Section 3.14 Population, Housing and Employment in the Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

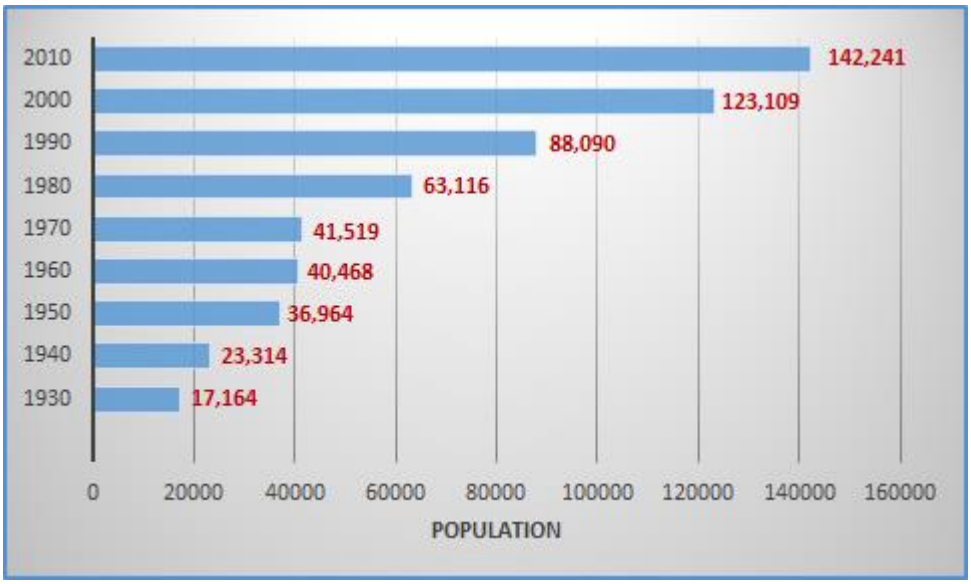
Population, Housing and Employment

During enhancement and revision of the 2013/2014 MCTC Transportation Model, MCTC revised the total households and employment for Year 2010 based upon data from the U.S Bureau of the Census, the California Department of Finance, the California Employment Development Department, the Central California Futures Institute, or from other sources.

Changes are reflected in the following tables originally included in Section 3.14 of the Draft PEIR.

FIGURE 3-13

Madera County Historical Population Growth: Years 1930 - 2010



Source: U.S. 2010 Census
2010 Population excludes group quarters population

TABLE 3-62

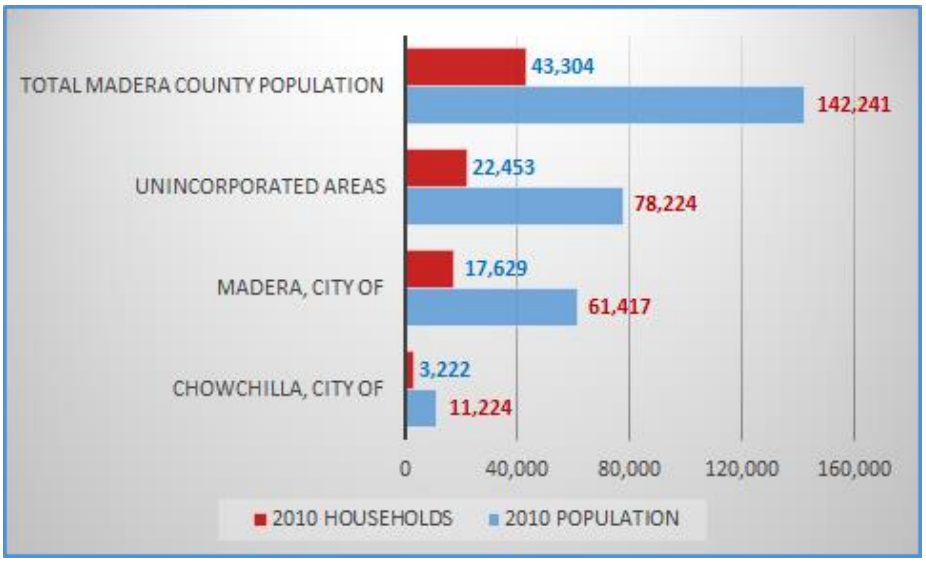
Madera County Population & Households as of January 1, 2010

AREA OF MADERA COUNTY	2010 POPULATION	2010 HOUSEHOLDS
Chowchilla, City of	11,224	3,222
Madera, City of	61,417	17,629
Unincorporated areas	78,224	22,453
Total Madera County Population	142,241	43,304

Source: U.S. 2010 Census
2010 Population excludes group quarters population

FIGURE 3-14

Madera County Population & Households as of January 1, 2010



Source: U.S. 2010 Census
2010 Population excludes group quarters population

TABLE 3-63
Employment and Madera County Residents by Industry Category - 2010

TOTAL EMPLOYMENT	43,547	% OF TOTAL EMPLOYMENT
Total Farm	**10,480**	24.1%
Total Nonfarm	**33,067**	75.9%
Mining, Logging, and Construction	***1,119***	2.6%
Manufacturing	***2,849***	6.5%
Trade, Transportation, and Utilities	***4,986***	11.4%
Wholesale Trade	712	1.6%
Retail Trade	3,459	7.9%
Transportation, Warehousing, and Utilities	814	1.9%
Information	***407***	0.9%
Financial Activities	***712***	1.6%
Professional and Business Services	***2,747***	6.3%
Educational Services (Private), Health Care, and Social Assistance	***6,003***	13.8%
Health Care and Social Assistance	5,698	13.1%
Leisure and Hospitality	***2,645***	6.1%
Other Services (excludes 814-Private Household Workers)	***814***	1.9%
Government	***10,785***	24.8%
Federal Government (D)	407	0.9%
State and Local Government	10,480	24.1%
State Government	2,544	5.8%
Local Government	7,834	18.0%
Local Government Education	4,375	10.0%

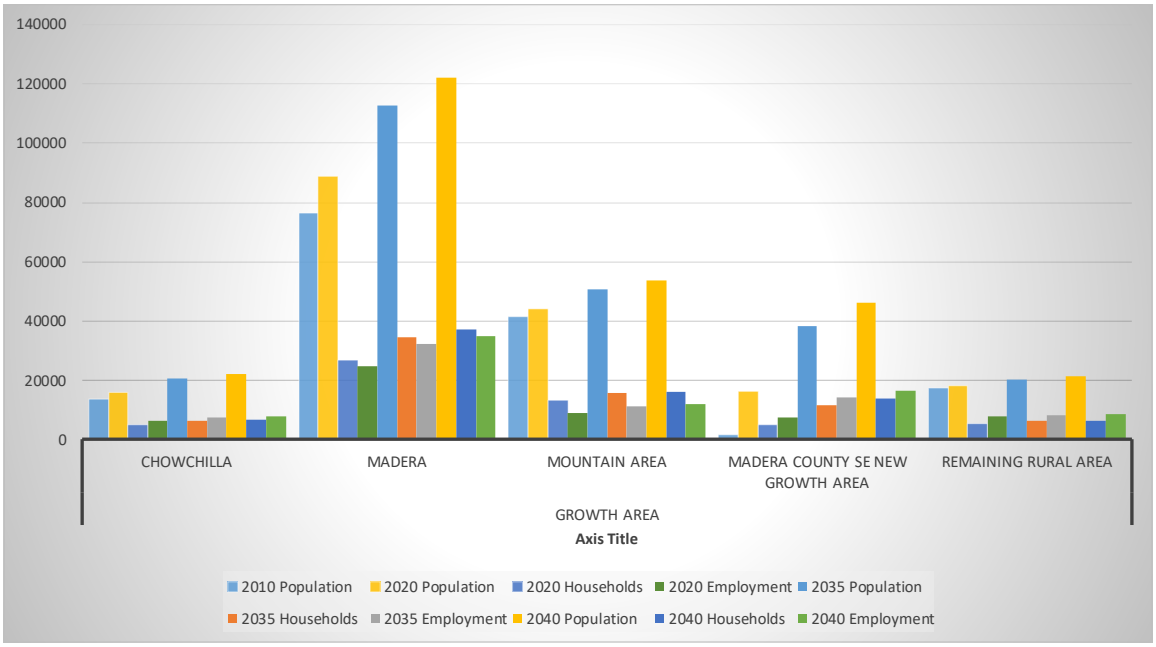
Source: U.S. Economic Census, the California DOF, the California EDD, VRPA Technologies, Inc.

TABLE 3-64
Madera County Development Projections (2010, 2020, 2035, and 2040)

YEAR	SOCIO-ECONOMIC CONDITIONS	GROWTH AREA					Total
		Chowchilla	Madera	Mountain Area	Madera County SE New Growth Area	Remaining Rural Area	
2010	Population	13810	76516	41535	1509	17496	150865
	Households	3964	21963	11922	433	5022	43304
	Employment	5384	20154	7552	2924	7533	43547
2020	Population	16078	88741	43973	16305	18079	183176
	Households	4893	27006	13382	4962	5502	55745
	Employment	6201	24855	8961	7363	7815	55195
2035	Population	20489	112681	50760	38319	20281	242530
	Households	6286	34570	15573	11756	6222	74407
	Employment	7556	32387	11255	14092	8418	73708
2040	Population	22199	121984	53617	46109	21252	265161
	Households	6750	37091	16303	14020	6462	80626
	Employment	8007	34897	12020	16334	8619	79877

Source: MCTC 2016 Transportation Model and VRPA Technologies, Inc.
Includes group quarters population

FIGURE 3-15
Madera County Development Projections (2010, 2020, 2035, and 2040)



Source: MCTC 2016 Transportation Model and VRPA Technologies, Inc.
Includes group quarters population

Transportation/Traffic (The sections below replace various paragraphs or tables in Section 3.17 Transportation/Traffic in the Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

Transportation/Traffic

The following paragraphs and table are added to the end of Section 3.17.2 on page 3-403:

Based on an examination of the analysis, findings, and conclusions of the certified 2014 RTP/SCS PEIR, implementation of the Project would not increase the severity of impacts identified in the Previous EIR, nor would it result in new significant impacts related to transportation and traffic that were not identified in the certified PEIR. The Project would not result in significant off-site or cumulative effects related to transportation and traffic not previously discussed because projects contained in the adopted 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the certified 2014 RTP/SCS PEIR. In fact, the enhanced transportation modeling result a reduction in overall traffic impacts compared to the certified 2014 RTP/SCS PEIR.

Table 3-71a below provides a comparative analysis of roadway level of service (LOS) impact of the 2014 RTP/SCS from the certified PEIR with analysis using the enhanced and revised MCTC Transportation Model. Examining Table 3-71a, it is evident that the enhanced transportation modeling indicates the same or reduced traffic impacts at most locations compared to the certified 2014 PEIR. Three cases of apparently worsened impact were examined more closely. This further analysis found that the SR 99 - SB Off Ramp at Olive Avenue will function adequately at the signalized intersection at the end of the ramp, which is the critical location controlling flows from the ramp. At the two other locations with apparent worsening LOS (Avenue 16 from Granada Drive to Schnoor Street, and Avenue 12 from Road 36 to Road 38), it was found that the apparent degradation was due to incorrect modeling and analysis assumptions. With appropriate inputs and assumptions, it was determined that each of these roadway segments will operate at an acceptable Level of Service (LOS). Therefore, the 2014 RTP/SCS Amendment #1 will not further exceed, either individually or cumulatively, the level of service standard.

TABLE 3-71a

2014 RTP/SCS Model LOS Results VS. 2016 Model LOS Results

ROADWAY SEGMENT	2040 LOS DEFICIENCIES: MCTC 2014 RTP and SCS – AM Peak	MCTC 2014 RTP and SCS – PM Peak	MCTC Model File Provided in 2016 – AM Peak	MCTC Model File Provided in 2016 – PM Peak	NOTES and COMMENTS
SR 41 - County Line to Allen Road	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 41 - Allen Road to Bass Lake Road	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 41 - SR 49 to Road 420	LOS E	LOS D	LOS C or Better	LOS F (partial) LOS E (partial - majority)	Segment was deficient for AM or PM conditions under either model.
SR 41 - Holly Lane to Road 415	LOS E / F(partial)	LOS E	LOS C or Better	LOS F (NB) / E (SB)	AM Peak in 2016 improved. PM Peak still deficient. No change for segment.
SR 41 - Road 415 to Spinelli Road	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 41 - Spinelli Road to Road 200	LOS C or Better LOS D (partial) / LOS F (partial)	LOS E	LOS C or Better	LOS C or Better	LOS improved.
SR 41 - Road 200 to Road 406	LOS F	LOS F	LOS C or Better	LOS D (NB)	LOS improved.
SR 41 - Road 406 to SR 145	LOS C or Better LOS D (partial) / LOS F (partial)	LOS C or Better LOS D (partial) / LOS F (partial)	LOS C or Better	LOS C or Better LOS D (NB partial)	LOS improved.
Avenue 9 - Road 40 to Crocket Way	LOS C or Better LOS D (partial)	LOS D	LOS C or Better	LOS C or Better	LOS improved.
SR 99 - Avenue 27 to Avenue 24 1/2	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 99 - Avenue 24 1/2 to SR 152	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
SR 99 - SB On-Ramp at Avenue 24	LOS C or Better	LOS C or Better	LOS C or Better	LOS D	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 20 SB Off Ramp to SB On Ramp	LOS C or Better	LOS C or Better	LOS D (SB)	LOS D (NB)	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 20 to Avenue 18 1/2 Off Ramp	LOS C or Better	LOS C or Better	LOS D (SB)	LOS D	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 18 1/2 SB Off Ramp to SB On Ramp	LOS C or Better	LOS C or Better	LOS D (SB)	LOS C or Better	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 18 1/2 SB On Ramp to Avenue 17	LOS C or Better	LOS C or Better	LOS D (SB)	LOS C or Better	2016 LOS Within Min. LOS Standard
SR 99 - Avenue 17 to Ellis Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Airport Drive - South of Avenue 17	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (NB)	2016 LOS Within Min. LOS Standard
SR 99 - Cleveland Avenue to 4th Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
H Street - North of 4th Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (NB)	2016 LOS Within Min. LOS Standard
N Street - North of 4th Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (SB)	2016 LOS Within Min. LOS Standard
SR 99 - Yosemite Avenue to Olive Avenue	LOS C or Better	LOS C or Better LOS F (partial)	LOS C or Better	LOS C or Better	LOS improved.
SR 99 - NB On Ramp at Madera Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS D	2016 LOS Within Min. LOS Standard
SR 99 - SB Off Ramp at Olive Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS E	Ramps inappropriate for LOS calculation; the signalized intersection LOS at end of the ramp will be Within Standard
Cleveland Avenue - Gateway Drive to Cleveland Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (NB)	2016 LOS Within Min. LOS Standard
Cleveland Avenue - Raymond Road to SR 145	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Tozer Street - SR 145 to Avenue 15	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Avenue 16 - Granada Drive to Schnoor Street	LOS C or Better	LOS C or Better	LOS C or Better	LOS E EB (partial) LOS F NB (partial)	This is due to a model coding error. The links are already 2 lanes in each direction. The model is showing 1 lane in each direction. LOS with 4 lanes will be LOS D or better.
Avenue 15 - Road 28 to Road 28 1/2	LOS C or Better	LOS C or Better	LOS C or Better	LOS C or Better	No change.
Avenue 14 - SR 99 SB Off Ramp to Madera Avenue	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (EB)	2016 LOS Within Min. LOS Standard
Avenue 14 - East of Roosevelt Ave	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (EB)	2016 LOS Within Min. LOS Standard
Avenue 12 - Road 36 to Road 38	LOS C or Better	LOS C or Better	LOS C or Better	LOS D (partial) LOS E (partial)	Ave 12 has a segment with a two way left turn lane and a segment without a two way left turn lane. If the two way left turn lane is extended to the entire segment in the future, LOS D would be achieved with the forecasted traffic. The Florida tables capacity value we would normally use for Madera County roadway segment analysis is conservative. This could be expressed mathematically by assuming more green time than the default value, if needed. If the two way left turn land is not extended in the future, we could still claim LOS D as the result if we consider Avenue 12 to be a rural/uninterrupted roadway in the segment without a two way left turn lane, which it will continue to function as. The area is not considered urban.

Chapter 4 Project Alternatives (The sections below replace various paragraphs, tables or figures in Chapter 4 Project Alternatives in the Draft PEIR and changes to Section 3.0 reflected in the Final PEIR)

Table 4-2 on page 4-5 of the certified 2014 RTP/SCS PEIR is replaced with the table on page 133 to reflect updated performance measure results utilizing the 2016 MCTC Transportation Model.

Figure 4-1 on page 4-7 of the Draft 2014 RTP/SCS PEIR is replaced with the figure on page 134 to reflect the updated land use allocation utilizing data from the 2016 MCTC Transportation Model.

Table 4-3 on page 4-10 of the certified 2014 RTP/SCS PEIR is replaced with the table below to reflect updated performance measure results utilizing the 2016 MCTC Transportation Model.

TABLE 4-3
Year 2010, No Project and Project VMT and Air Quality Emissions

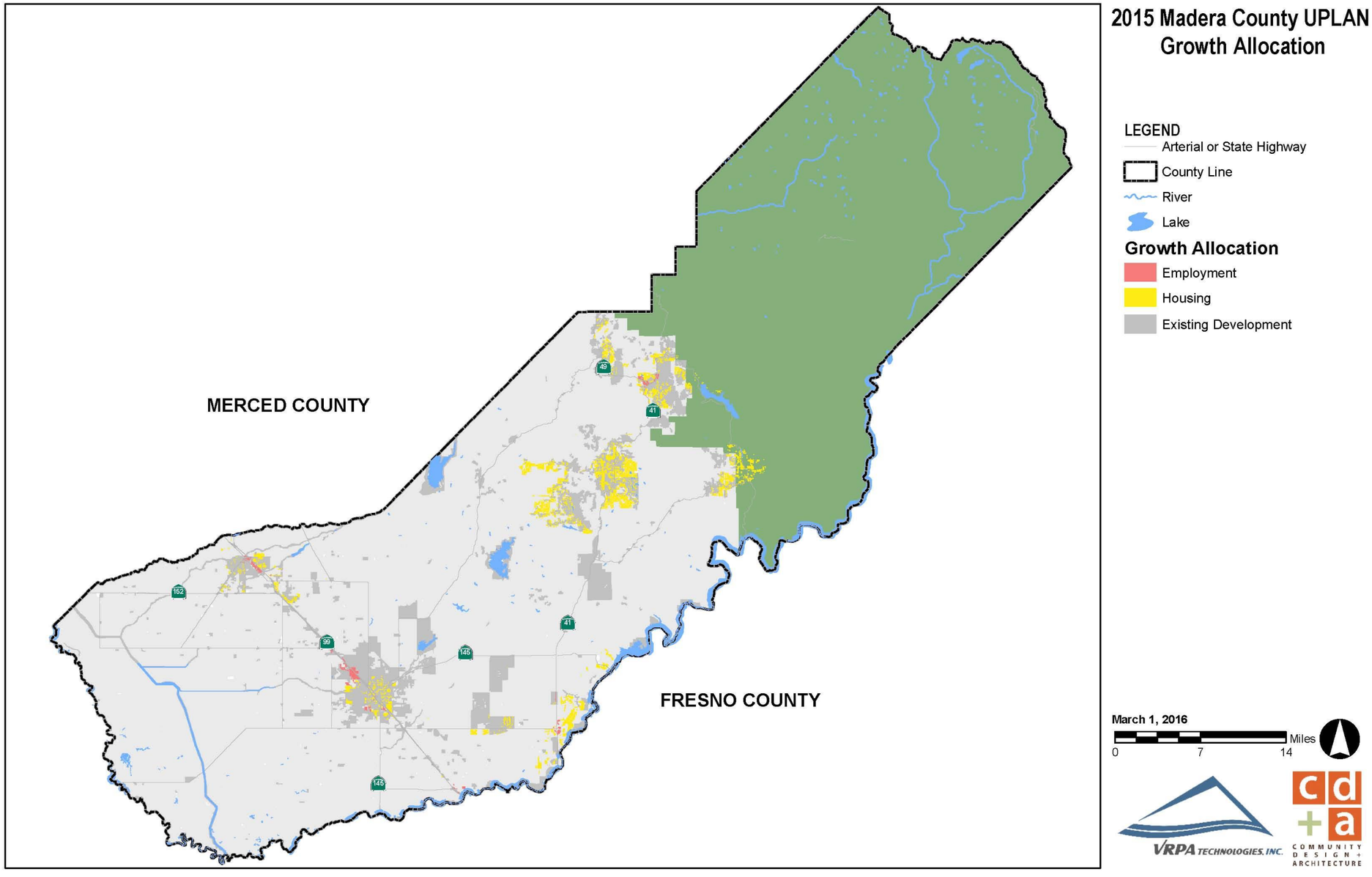
Category	2010	2040 No Build	2040 Build (2014 RTP/SCS Scenario B)
VMT	3,135,896	5,312,829	6,029,666
ROG (tons/day)	1.70	0.79	0.48
CO (tons/day)	19.07	7.89	3.28
NOX (tons/day)	6.60	2.32	1.57
PM10 (tons/day)	0.35	0.37	0.36
PM2.5 (tons/day)	0.22	0.17	0.15

Source: MCTC, EMFAC 2014

TABLE 4-2
2014 RTP AND SCS PERFORMANCE MEASURES OF MODELED SCENARIOS

Type	Performance Measure/Indicator	Definition	Status Quo	Low Change	Hybrid
Land Use (Location Efficiency)	Residential density	Average residential density for new growth	2.9	3.2	3.3
	Percent of work trips less than 10 miles	Share of total work trips which are fewer than 10 miles	31%		31%
	Work trip length distribution - Minutes (Miles)	Statistical distribution of work trip length in the region	30.09 (24.14)		30.17 (24.23)
	Percent of work trips crossing county boundaries	Share of total work trips which are crossing county boundaries for jobs	52%		52%
	Housing	Percent of housing by types	87.1%/12.9%	80.0%/20.0%	75.4%/24.6%
	Compact development	Growth in population compared with acres developed	8.5	9.3	9.7
	Access to transit line	New housing development within half-mile of transit stops	N.A.	4,374/11.7%	9,353/13.0%
Transportation (Mobility, Accessibility, and Reliability)	(Recurrent) person delay per capita	Daily delay per capita in minutes	0.0038		0.0036
	Average distance for work trips in minutes and miles	Work average distribution in minutes and miles (excluding through): Minutes (Miles)	W - 30.09 / NW - 24.14		W - 30.17 / NW 24.23
	Average distance for non-work trips in minutes and miles	Non-work average distribution in minutes and miles (excluding through): Minutes (Miles)	W - 14.08 / NW - 8.17		W - 14.19 / NW - 8.29
	Percent of work trips accessible in 30 minutes	% of work opportunities (trip ends) within 30 minutes of household (home-based work)	86%		87%
	Percent of non-work trips accessible in 15 minutes	% of non-work opportunities (trip ends) within 15 minutes of household (home-based other)	81%		81%
	Vehicle miles traveled (VMT)	Total VMT and per capita VMT	5,312,578 / 20.04	5,253,752 / 19.81	5,241,875 / 19.77
	Congested vehicle miles traveled (VMT)	Congested VMT total and per capita, percentage of total auto/transit travel in congested conditions (peaks, all day)	218,149		241,857
	Commute travel (work trip) mode share	Weekday trips by mode - Peak (Off Peak)			
		Drive Alone	37.56% (36.93%)		40.71% (40.03%)
		Shared-Ride 2	32.28% (31.74%)		31.31% (30.78%)
		Shared Ride 3+	28.58% (28.11%)		26.21% (25.32%)
		Transit	0.18% (0.33%)		0.31% (0.39%)
		Walk	0.12% (0.26%)		0.14% (0.30%)
		Bike	1.28% (2.63%)		1.46% (3.00%)
Healthy Environment	Criteria pollutants emissions	CO, NOX, PM2.5, PM10, and VOC	7.89, 2.32, 0.17, 0.37, 0.79	7.81, 2.29, 0.17, 0.36, 0.78	7.79, 2.29, 0.17, 0.36, 0.78
	Greenhouse gas reduction	Per capita greenhouse gas reduction against 2005	+10.32%	+9.7%	-23.5%
	Fuel consumption	On-road fuel consumed in gallons per capita	1.41		1.39
	Active transportation and transit travel	Weekday person trips by transit, walk and bike modes	33,923	32,571	33,101
	Near-roadway exposures	Percent of new housing within 1,000 feet of freeway or major roadway	19,392 / 52.0%	23,100 / 61.7%	23,403 / 62.5%
	Percent investment in active transportation	Investment in active transportation (sidewalks, bike lanes, etc.) as compared to total plan			
Social Equity	Accessibility	Average A.M. peak work trip time by mode by Environmental Justice (EJ) and Non-EJ Traffic Analysis Zones (TAZ)			
	All Zones to All Zones:				
	Peak Drive Alone Travel Time		19.7		19.78
	Peak Shared Ride Travel Time		17.28		17.37
	Peak Transit Travel Time		43.07		43.65
	Off-Peak Drive Alone Travel Time		13.65		13.79
	Off-Peak Shared Ride Travel Time		13.95		14.1
	Off-Peak Transit Travel Time		43.38		44.23
	All Zones to EJ Zones:				
	Peak Drive Alone Travel Time		11.33		11.79
	Peak Shared Ride Travel Time		9.76		10.13
	Peak Transit Travel Time		36.19		36.42
	Off-Peak Drive Alone Travel Time		8.83		9.14
	Off-Peak Shared Ride Travel Time		8.78		9.12
	Off-Peak Transit Travel Time		35.64		36.2
	EJ Zones to All Zones:				
	Peak Drive Alone Travel Time		14.2		14.25
	Peak Shared Ride Travel Time		11.22		11.4
	Peak Transit Travel Time		38.06		37.9
	Off-Peak Drive Alone Travel Time		8.81		9.13
	Off-Peak Shared Ride Travel Time		8.77		9.1
	Off-Peak Transit Travel Time		37.65		37.43
	Equity	Comparison of percentage of person-miles of travel with percentage of transportation investment for EJ and non-EJ TAZ			
	*** Transit person miles traveled (PMT) for all zones - Daily PMT		7,166		6,570
	*** Transit PMT for EJ zones - Daily PMT		6,024		5,455
Resource Conservation	Land consumption	Acres of land consumed due to new development	14,503	13,145	12,652
	Important farmland	Total acres of important farmland (prime, unique and state-wide importance) consumed due to new growth	146	142	136
	Environmental resource land	Total acres of resource areas (CNDDB, critical habitat, FEMA, habitat connectivity, riparian forest, vernal pools & wetlands)	975	1,255	1,233
	Water consumption	Daily water consumption by new housing development based on national average rates	2,597,713	2,443,487	2,376,819

FIGURE 4-1
Preferred Project Alternative Land Use Pattern



The 1st paragraph under the bullet titled "Climate Change" and Table 4-4 on page 4-11 of the Draft 2014 RTP/SCS PEIR is replaced with the paragraph and table below to reflect updated GHG emission results utilizing the 2016 MCTC Transportation Model.

Climate Change impacts are determined considering annual tons of greenhouse gas emissions (Carbon Dioxide or CO_2, Methane or CH_4), Nitrous Oxide or N_2O and others). The No Project Alternative is expected has a lower greenhouse gas reduction percentage against 2005 levels compared to the Preferred Project Alternative in 2040. Table 4-4 shows the comparison GHG emissions for the Year 2040 No Project Alternative and the Preferred Project Alternative for the Year 2040.

TABLE 4-4
Year 2040 No Project GHG Emissions
Vs. Year 2040 Preferred Project GHG Emissions

Year	Pounds per Capita GHG Emissions[1]	% Change from 2005	VMT Per Capita	% Change from 2005
2040 No Build				
2005	15.2	--	18.7	--
2020	17.4	14.5%	20.9	11.8%
2035	16.8	10.5%	20.4	9.1%
2040 RTP/SCS				
2005	17.0	--	18.7	--
2020	14.9	-12.4%	17.0	-9.1%
2035	13.0	-23.5%	15.4	-17.6%

1: Total CO2 Emissions
Source: MCTC, EMFAC 2014

The 1st paragraph under the bullet titled "Climate Change" on page 4-27 of the Draft 2014 RTP/SCS PEIR is replaced with the paragraph below to reflect updated GHG emission results utilizing the 2016 MCTC Transportation Model.

Climate Change impacts are determined considering annual tons of greenhouse gas emissions (Carbon Dioxide or CO_2, Methane or CH_4), Nitrous Oxide or N_2O and others). The Status Quo alternative has a lower greenhouse gas reduction percentage (10.32%) against 2005 levels compared to the Preferred Project Alternative in 2040.

The 1st paragraph under the bullet titled "Energy and Energy Consumption" on page 4-29 of the Draft 2014 RTP/SCS PEIR is replaced with the paragraph below to reflect VMT results utilizing the 2016 MCTC Transportation Model.

The Status Quo alternative will have lower congested VMT in 2040 vs. the Preferred Project Alternative in 2040. Because of the lower VMT with the Status Quo alternative, there will be lower fuel consumption.

The 1st bullet on page 4-49 of the Draft 2014 RTP/SCS PEIR is replaced with the below to reflect target compliance results utilizing the 2016 MCTC Transportation Model.

- ✓ ***Meets GHG Reduction Targets***

  The Preferred Project Alternative takes into consideration requirements of SB 375 and Sustainable Communities Strategy elements. As part of its mandate under SB 375, in 2010, the California Air Resources Board (CARB) set specific GHG emission reduction targets for cars and light trucks for each of the state's 18 metropolitan planning organizations from a 2005 base year. The GHG targets set for the Madera region call for a 5 percent per capita reduction by 2020, and a 10 percent per capita reduction by 2035. MCTC has demonstrated that the 2014 RTP and SCS (Preferred Project Alternative) will meet the CARB GHG emission reduction targets for 2020 and 2035.

EVALUATION OF OTHER ENVIRONMENTAL ISSUE AREA IMPACTS

Aesthetics

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to aesthetic resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to aesthetic resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Agricultural Resources

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to agricultural resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to agricultural resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Air Quality

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to air quality that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to air resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR. In fact, the enhanced transportation modeling implies a reduction in criteria air pollutants compared to the Previous EIR.

Biological Resources

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to biological resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative

effects related to biotic resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Climate Change

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to climate change that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to GHG emissions not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR. In fact, the enhanced transportation modeling implies a reduction in both GHG (as well as criteria air pollutants) compared to the Previous EIR.

Cultural Resources

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to cultural resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to cultural resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Energy and Energy Conservation

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to energy resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to energy and energy conservation not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR. The energy analysis utilizes countywide fuel consumption, which is based on estimates from EMFAC. The information is broken down considering total fuel per capita. Since population estimates and projections did not change, changes to energy impacts are not expected to change significantly.

Geology, Soils and Mineral Resources

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to geology, soils and mineral resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to geology, soils and mineral resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Hazards and Hazardous Materials

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to hazards and hazardous materials that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to hazards and hazardous materials not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Hydrology and Water Resources

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to hydrology and water resources that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to hydrology and water resources not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Land Use and Planning

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to land use and planning that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to land use and planning not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Noise

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to noise that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to noise not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR. Noise data was not revised since volumes along SR 41 and SR 145, slightly decreased with the 2016 MCTC Transportation Model, as a result, impacts referenced in the certified 2014 RTP/SCS PEIR to not increase as a result of changes to the 2013/14 Transportation Model.

Population, Housing and Employment

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to population, housing and employment that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to population, housing and employment not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Social and Economic Effects

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to social and economic effects that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative effects related to social and economic effects not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Public Utilities, Other Utilities and Service Systems

Based on an examination of the analysis, findings, and conclusions of the Previous EIR, implementation of the Project would not increase the severity of significant impacts identified in the Previous EIR, nor would it result in new significant impacts related to public utilities that were not identified in the Previous EIR. The Project would not result in significant off-site or cumulative

effects related to public utilities, other utilities and service systems not previously discussed because projects contained in the 2014 RTP/SCS have not changed. No new projects have been included in the RTP/SCS that would increase the severity of impacts reflected in the previous EIR.

Mandatory Findings of Significance

This assessment indicates that there are no significant and unavoidable impacts related to any of the environmental issue areas associated with the Project that would substantially degrade the quality of the environment. There are no changes in the Project or in circumstance, nor is there any new information that would result in new significant environmental effects that would potentially degrade the quality of the environment, or a substantial increase in the severity of previously identified environmental effects that would potentially degrade the quality of the environment. In fact, the enhanced transportation modeling implies a reduction in various air quality, GHG, noise, and traffic impacts compared to the Previous EIR.

CUMULATIVE IMPACTS

The Amended Project will not result in any new or greater significant impacts than those previously identified by the Certified 2014 RTP/SCS PEIR since the improvement projects contained in Chapter 4 of the 2014 RTP/SCS are not changing with amendment to the 2014 RTP/SCS (Amendment #1) and VMT and vehicle trips associated with the Amended Project are lower than those utilized to environmentally assess the adopted 2014 RTP/SCS. The only changes to the 2014 RTP/SCS and the 2014 RTP/SCS Amendment #1 Addendum PEIR are those changes that are affected by revised transportation, air quality and climate change modeling and the ability of the 2014 RTP/SCS to meet GHG emissions targets set forth by CARB in accordance with SB 375. As a result, the Amended Project would result in similar impacts when compared with the Approved Project.

The previous EIR found several cumulatively considerable impacts associated with development of the Project. Mitigation measures are required of the Project to address these cumulative effects. These cumulative impacts were fully discussed and disclosed in the previous EIR. There are no changes in the Project or in circumstance, nor is there any new information that would result in new significant cumulative environmental effects or a substantial increase in the severity of previously identified cumulative environmental effects. There are no changes in the Project or in circumstance, nor is there any new information that would result in new significant environmental effects that would cause a substantial adverse effect on humans, or a substantial increase in the severity of

previously identified environmental effects that would cause a substantial adverse effect on humans.

Based upon the cumulative analysis contained in the certified 2014 RTP/SCS PEIR (Chapter 4), which can be found at www.maderactc.org, and this 2014 RTP/SCS Addendum PEIR, there would be no increase in the Amended Project's incremental contribution to any cumulative impacts.

SUMMARY OF MITIGATION MEASURES & MITIGATION MONITORING PROGRAM

The following section provides a summary of the mitigation measures and the associated mitigation monitoring program. Based on findings identified in Section 4 of the Draft EIR, projects contained in the 2014 RTP/SCS and the Air Quality Impact and Conformity Analysis, the Preferred Project Scenario is implementation of the 2014 RTP and SCS (SCS Hybrid scenario). The Project is considered the "Environmentally Preferred Alternative". This alternative was analyzed considering historical growth rates in vehicle miles traveled (VMT) and vehicle trips (VT), as well as anticipated growth in the use of other forms of transportation such as transit, rail, aviation, and non-motorized.

It is expected that the 2014 RTP and SCS (Preferred Project Scenario) will produce benefits beyond simply reducing GHG emissions. The 2014 RTP and SCS will help the region contend with many ongoing issues across a wide range of concerns, including placemaking, the environment, responsiveness to the marketplace, and mobility:

- ✓ The 2014 RTP/SCS promotes development of better places to live and work through measures that encourage more compact development, varied housing options, bike and pedestrian improvements, and efficient transportation infrastructure.

- ✓ The demographic profile of the region is changing and the market for housing is changing with it. Residents will be looking for a "value lifestyle" in which both housing and transportation costs are minimized even as they maintain a high-quality of life. Strategies focused on high-quality places, compact infill development, and more housing and transportation choices provide a response to these newly emerging market forces.

- ✓ By including options that create more compact neighborhoods and placing destinations closer to homes and closer to one another, the 2014 RTP and SCS's strategies can reduce the cost of development for taxpayers and reduce everyday costs of housing and transportation.

- ✓ Reducing the footprint of new development protects farmland and open space.

- ✓ The 2014 RTP/SCS does not envision wholesale redevelopment of the region. The vast majority of neighborhoods and business districts that will exist in 2040 already exist today, and most of them will be unchanged in the next 20-25 years. Rather, the 2014 RTP and SCS envisions a new development pattern for new neighborhoods and revitalized neighborhoods and business districts that will build upon current patterns to give residents more choices and opportunities as they consider where to live and work.

The Preferred Project Scenario was developed considering the existing general plans for each of the local jurisdictions within the County As a result, the Project Alternatives are ***not feasible, achievable, or implementable*** without local jurisdictions making ***significant revisions*** to adopted general plans.

Mitigation measures are included in the certified 2014 RTP PEIR available at www.maderactc.org to address potential environmental impacts. Additional impacts and mitigations measures have not been added as a result of the Amended Project or Amendment #1 to the 2014 RTP/SCS.

SUMMARY OF OVERRIDING CONSIDERATIONS & UNAVOIDABLE ENVIRONMENTAL IMPACTS

A summary of the Statement of Overriding Considerations and Unavoidable Environmental Impacts associated with the 2014 RTP/SCS and approved as part of the 2014 RTP/SCS PEIR process are contained in the 2014 RTP/SCS PEIR and available for review at www.maderactc.org. Additional overriding considerations and unavoidable environmental impacts have not been added as a result of the Amended Project or Amendment #1 to the 2014 RTP/SCS.

APPROVALS REQUIRED

This AEIR only contains changes necessary to make the previous 2014 RTP/SCS PEIR adequate, and the changes made by this AEIR do not raise important new issues about the significant effects to the

environment. This AEIR need not be circulated for public review but will be included in or attached to the Final PEIR, which by reference includes the Draft PEIR, Overriding Considerations and Unavoidable Environmental Impacts, and Mitigation Monitoring Program.

MCTC must decide whether to certify the AEIR as the PEIR for the 2014 RTP/SCS Amendment #1, prior to approving the proposed project.

SOURCES OF INFORMATION USED IN PREPARING THE ADDENDUM EIR

- ✓ 2014 RTP/SCS, Draft Program EIR, Released for Public Review on May 1, 2014
- ✓ 2014 RTP/SCS, adopted on July 24, 2014
- ✓ 2014 RTP/SCS, Final EIR, Mitigation Monitoring and Reporting Program, and Statement of Overriding Considerations, certified on July 24, 2014
- ✓ MCTC COG Staff: personal communication, 2016 and 2017
- ✓ State of California, Office of Planning and Research, California Environmental Quality Act (CEQA) Guidelines, 2016 and 2017

LIST OF PREPARERS

- ✓ Patricia Taylor, Executive Director, MCTC
- ✓ Dylan Stone, Regional Planning Supervisor, MCTC
- ✓ Troy McNeil, Fiscal Supervisor, MCTC
- ✓ Georgiena Vivian, President, VRPA Technologies, Inc.
- ✓ Richard Lee, Ph.D. AICP Director of Innovation and Sustainability, VRPA Technologies, Inc.
- ✓ Erik Ruehr, P.E., Director of Traffic Engineering, VRPA Technologies, Inc.
- ✓ Jeff Stine, Senior Transportation Planner, VRPA Technologies, Inc.
- ✓ Jason Ellard, Transportation Engineer, VRPA Technologies, Inc.
- ✓ Dena Graham, Research Specialist, VRPA Technologies, Inc.