Program Environmental Impact Report
Addendum

March 16, 2023

Prepared For:

MCAG MERCED COUNTY ASSOCIATION OF GOVERNMENTS

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February 23, 2023

1. INTRODUCTION

The Merced County Association of Governments (MCAG) has prepared an amendment to the 2022 Regional Transportation Plan / Sustainable Communities Strategy (RTP/SCS). The 2022 RTP/SCS, adopted on August 18, 2022 by MCAG, included a list financially constrained improvement projects. Amendment No.1 is required to reflect additional passenger rail projects and revised phasing and modeling for various highway improvement projects. The total net change in funding for the passenger rail projects is $899 million over the 24-year period or between years 2022 and 2046 specifically related to the cost of new passenger rail projects. The additional cost of these passenger rail projects will be addressed by additional funding including Interregional Transportation Improvement Program (ITIP), Senate Bill (SB) 1 (TCEP, TIRCP, Congested Corridors, and other related funds), and other (PTA, SRA, Port and Freight, and other).

As later shown in Table 1, the listing of nineteen (19) regionally significant roadway projects, currently reflected in the 2022 RTP/SCS, includes two new modeled projects, and phasing and open-to-traffic changes to existing projects. Details are presented below.

- ✓ Two new projects:
  1. Bellevue Road Realignment/Reconstruction. This is the replacement of existing roadway facility with a new realignment facility
  2. Mercey Springs Road (SR-165) Widening from Pioneer Road to SR-152 (Pacheco Blvd). This project was previously in the big Tier I projects listing in the adopted RTP/SCS
- ✓ Phasing of existing SR-59 Widening and Mission Avenue Widening projects.
- ✓ Changes to open-to-traffic years.
- ✓

The total number, location and cost of Tier I highway, bicycle and pedestrian, public transit, and aviation projects do not change from those approved as part of the 2022 RTP/SCS.

Amendment to the 2022 RTP/SCS allows the projects to be programmed into the Regional/Federal Transportation Improvement Program (RTIP/FTIP), making them eligible for funding. While the 2022 RTP/SCS has a long-term time horizon where projects are planned to be implemented, federal and

state requirements ensure that the Plan is flexible and responsive in the near term. As a result, the 2022 RTP/SCS is both a long-term transportation plan and a planning tool, which can be refined and modified.

This document prepared pursuant to the California Environmental Quality Act (CEQA), Public Resources Code 21000 *et seq*., constitutes an Addendum to the 2022 RTP/SCS Program Environmental Impact Report (2022 RTP/SCS PEIR) prepared and certified on August 18, 2022 for the 2022 RTP/SCS, and proposes that the certified 2022 PEIR together with this Addendum serve as the PEIR for the proposed 2022 RTP/SCS Amendment No.1 (Project). This PEIR Addendum outlines the changes to the Project, as analyzed in the 2022 RTP/SCS PEIR, and evaluates whether those changes, or new information or changed circumstances, would require substantial changes to the impacts identified or mitigation measures proposed in the 2022 RTP/SCS PEIR. The proposed project to amend the 2022 RTP/SCS does not create any new significant adverse environmental impacts outside of the scope of the analyses already contained in the previously certified 2022 RTP/SCS PEIR. Since the current proposed project would not generate any new significant adverse environmental impacts or make any existing significant impacts substantially worse, this Addendum to the 2022 RTP/SCS PEIR has been prepared. The 2022 RTP/SCS and 2022 RTP/SCS PEIR can be found at www.mcagov.org.

2. CEQA PROVISIONS

2.1 Basis for Addendum PEIR

As a part of MCAG's current review of the RTP/SCS Amendment No.1, it is necessary to identify any areas of the 2022 RTP/SCS PEIR that might be substantially impacted by changes in projects or policy direction. Section 15164 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; and/or

- ✓ 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 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.

While changes to the 2022 RTP/SCS Project List may represent "new information of substantial importance …" at the local project-level, these changes are not substantial at the regional program-level as analyzed in the 2022 RTP/SCS PEIR. More specifically, the proposed changes to the 2022-2046 RTP/SCS Project List documented in the 2022 RTP/SCS Amendment No.1 would not result in one or more significant effects (at the regional level) not discussed in the 2022 RTP/SCS PEIR, nor result in a substantial increase in the severity of previously identified significant effects disclosed in the 2022 RTP/SCS PEIR. In addition, no changes to the mitigation measures or alternatives contained in the 2022 RTP/SCS PEIR are necessary or being proposed that could trigger additional review regarding such measures. Finally, as discussed in the 2022 RTP/SCS PEIR, the level of detail for individual projects on the RTP/SCS Project List is generally insufficient to be able to analyze local effects. Such analysis is more appropriately undertaken in project-specific environmental documents prepared by the individual CEQA lead agencies proposing each project. MCAG has assessed potential environmental effects of the proposed changes to the 2022 RTP/SCS Project List at the regional program-level and finds that the additional and modified projects contained in Amendment No.1 are consistent with the region-wide environmental impacts analysis, mitigation measures or alternatives and Findings of Fact discussed in the previously certified 2022 RTP/SCS PEIR and do not result in any of the conditions described in CEQA Guidelines Section 15162(a)(1)(2)(3). For these reasons, MCAG has elected to prepare an addendum to the 2022 RTP/SCS PEIR rather than a Subsequent or Supplemental EIR and this Addendum No.1, which is prepared in accordance with CEQA Guidelines Section 15164.

Based upon review of the 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 2022 RTP/SCS PEIR. Since the proposed Project would not generate any new significant adverse environmental impacts or make any existing significant impacts substantially worse, an Addendum to the 2022 RTP/SCS PEIR has been prepared. The 2022 RTP/SCS, 2022 RTP/SCS PEIR, 2022 RTP/SCS Amendment No.1, and the 2022 RTP/SCS Draft PEIR Addendum prepared to address RTP/SCS Amendment No.1 can be found at www.mcagov.org.

3. ADDENDUM PURPOSE

MCAG has prepared this Addendum No.1 to the 2022 RTP/SCS PEIR to demonstrate that the proposed changes to the 2022 RTP/SCS Project List, contained in the 2022 RTP/SCS Amendment No.1, satisfies the requirements contained in Section 15164 of the CEQA Guidelines for the use of an Addendum to an EIR. The proposed changes to the Project List do not require the preparation of a Subsequent or Supplemental EIR pursuant to Sections 15162 and 15163, respectively, of the CEQA Guidelines due to the absence of new or substantially more adverse significant impacts than those analyzed in the certified EIR. This Addendum No.1 to the 2022 RTP/SCS PEIR neither controls nor determines the ultimate decision for approval of the 2022 RTP/SCS Amendment No.1 and the proposed changes to the 2022 RTP/SCS Project List contained therein. The information presented in this Addendum to the 2022 RTP/SCS PEIR will be considered by MCAG's Governing Board prior to making a decision on the 2022 RTP/SCS Amendment No.1.

4. PROJECT DESCRIPTION

4.1 2022 Regional Transportation Plan/Sustainable Communities Strategy, Program EIR, and 2022 RTP/SCS Amendment No.1 PEIR Addendum

The 2022 RTP/SCS is a planning guide containing transportation policy and projects for a 24-year period (through Fiscal Year 2022/46). The RTP/SCS is also used to guide development of the Regional Transportation Improvement Program (RTIP). The RTIP is the programming document used to plan the construction of regional transportation projects and requires State Department of Transportation (Caltrans) approval. Project-level assessment of environmental impacts was not addressed by the 2022 RTP/SCS PEIR nor have they been addressed in this RTP/SCS Amendment No.1 PEIR Addendum. The RTP/SCS is also used as a transportation planning document by each of the seven member jurisdictions of MCAG. The members include the County of Merced and the cities of Atwater, Dos Palos, Gustine, Livingston, Los Banos, and Merced.

The RTP/SCS identifies the region's mobility needs and issues through to the year 2046, sets forth an action plan of projects and programs to address needs consistent with the adopted policies, and documents the financial resources needed to implement the plan. Additional areas of emphasis and policy initiatives in the 2022 RTP/SCS include Climate Change (including a Climate Change Plan and other greenhouse gas policies), Environmental Justice, the Sustainable Communities Strategy, Goods Movement, and other major transportation planning activities. In addition, the 2022 RTP/SCS includes updated improvement project lists and updated performance measures. The 2022 RTP/SCS promotes a "balanced" transportation system. It calls for increased investments in alternative transportation modes, while accommodating a necessary amount of new highway capacity. The 2022 RTP/SCS is based on a preferred land use and transportation investment scenario. This scenario is referred to as Scenario 3: Conserve & Connect Merced County, or simply "the Plan". The Plan emphasizes controlled concentric growth, largely within the limits of the respective General Plans of local jurisdictions within Merced County. Development focuses on empty lots within city limits and gradual growth directly connected to established neighborhoods. This scenario allows for growth in

unincorporated communities, but no new unincorporated communities will be established. Development will be concentrated to minimize any conversion of prime farmland, focusing on "upward development" instead of "outward development."

The process to approve the 2022 RTP/SCS included: (1) assessing Merced County's transportation needs, identifying projects to address the needs, evaluating the projects considering benefit vs. cost and other performance objectives, and addressing air quality conformity requirements; (2) conducting public hearings on the RTP/SCS by MCAG, certification of the 2022 RTP/SCS PEIR by MCAG, and (3) approval of a resolution passed by MCAG approving the 2022 RTP/SCS. Public involvement was encouraged and received throughout the 2022 RTP/SCS development process. The 2022 RTP/SCS consists of required elements and is organized into the following chapters:

- ✓ Executive Summary
- ✓ Introduction
- ✓ Existing Conditions
- ✓ System Preservation
- ✓ Future Conditions
- ✓ Investment Plan
- ✓ Scenario Development
- ✓ Scenario Evaluation
- ✓ Action Plan
- ✓ Environmental Justice
- ✓ Public Participation

The RTP/SCS, in conjunction with General Plan Circulation Elements adopted by the County of Merced 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 2022 RTP/SCS considered a projection of funding sources that may be available to finance transportation improvement projects over time. The projection of funds in the 2022 RTP/SCS was accomplished considering historical allocations of federal, state, and other funding.

To evaluate the regional impacts associated with the 2022 RTP/SCS, a Program EIR (PEIR) 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 issuances 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."

After reviewing CEQA Section 15164 (referenced above), it was determined that the obligation to prepare another Subsequent or Supplemental EIR for Amendment No.1 was not met and that an Addendum was the appropriate environmental document to address the 2022 RTP/SCS Amendment No 1.

4.2 Amendment No.1 to the 2022 RTP/SCS

The scope of the proposed 2022 RTP/SCS Amendment No.1 is required to reflect additional passenger rail projects and revised phasing for various highway improvement projects. Amendment to the 2022 RTP/SCS also allows the projects to be programmed into the Regional/Federal Transportation Improvement Program (RTIP/FTIP), making them eligible for funding.

The total net change in funding for the passenger rail projects is $899 million over the 24-year period or between years 2022 and 2046 specifically related to the cost of new passenger rail projects. The additional cost of these passenger rail projects will be addressed by additional funding including Interregional Transportation Improvement Program (ITIP), Senate Bill (SB) 1 (TCEP, TIRCP, Congested Corridors, and other related funds), and other (PTA, SRA, Port and Freight, and other). The rail projects include extended Altamont Corridor Express (ACE) rail service to Modesto, Ceres, and Merced, which will provide commuter-oriented passenger rail service connecting Merced and Stanislaus County to the Bay Area. Funding from SB 132 and additional state and federal sources will provide for new track, infrastructure improvements, and new rolling stock for the expanded service. Transit station improvements are being pursued by the Cities of Manteca, Ripon, Modesto, Ceres, Turlock, Livingston, and Atwater to accommodate new ACE passenger rail service. The City of Merced will be the main passenger rail hub for the Central Valley, providing cross-platform connections to each of the three services, as well as direct connections to local, regional, and intercity transit services. To meet the needs of the new hub, a new station will be constructed in Downtown Merced. An aerial connector, known as the Merced Intermodal Track Connector or MITC, will carry San Joaquins trains from the BNSF right-of-way (ROW) to the new station located on UPRR ROW.

The listing of nineteen (19) regionally significant roadway projects, currently reflected in the 2022 RTP/SCS, includes two new projects, and phasing and open-to-traffic changes to existing projects.

The total number, location and cost of Tier I highway, bicycle and pedestrian, public transit, and aviation projects do not change from those approved as part of the 2022 RTP/SCS. The proposed 2022 RTP/SCS Amendment No.1 necessitates preparation of a transportation/air quality conformity analysis, agricultural land, noise and transportation impacts, and an Addendum to the programmatic PEIR for the 2022 RTP/SCS to address interim year analysis of air quality and climate change impacts.

Table 1 reflects the RTP/SCS Amendment No. 1 changes to the Regionally-Significant Roadway Projects. These changes don't alter the original project limits, but rather, phase and clarify the fundable work segments. The open to traffic years have also been updated. There are also two new projects added.

In addition, passenger rail projects are added to the list of projects. Tables 1 and 2 amend Appendix K, Table K-1 in the 2022 RTP/SCS and Appendix B-1 in the 2022 RTP/SCS Draft PEIR. Figure 1 provides a graphic view of the revised or additional passenger rail projects referenced in Table 2.

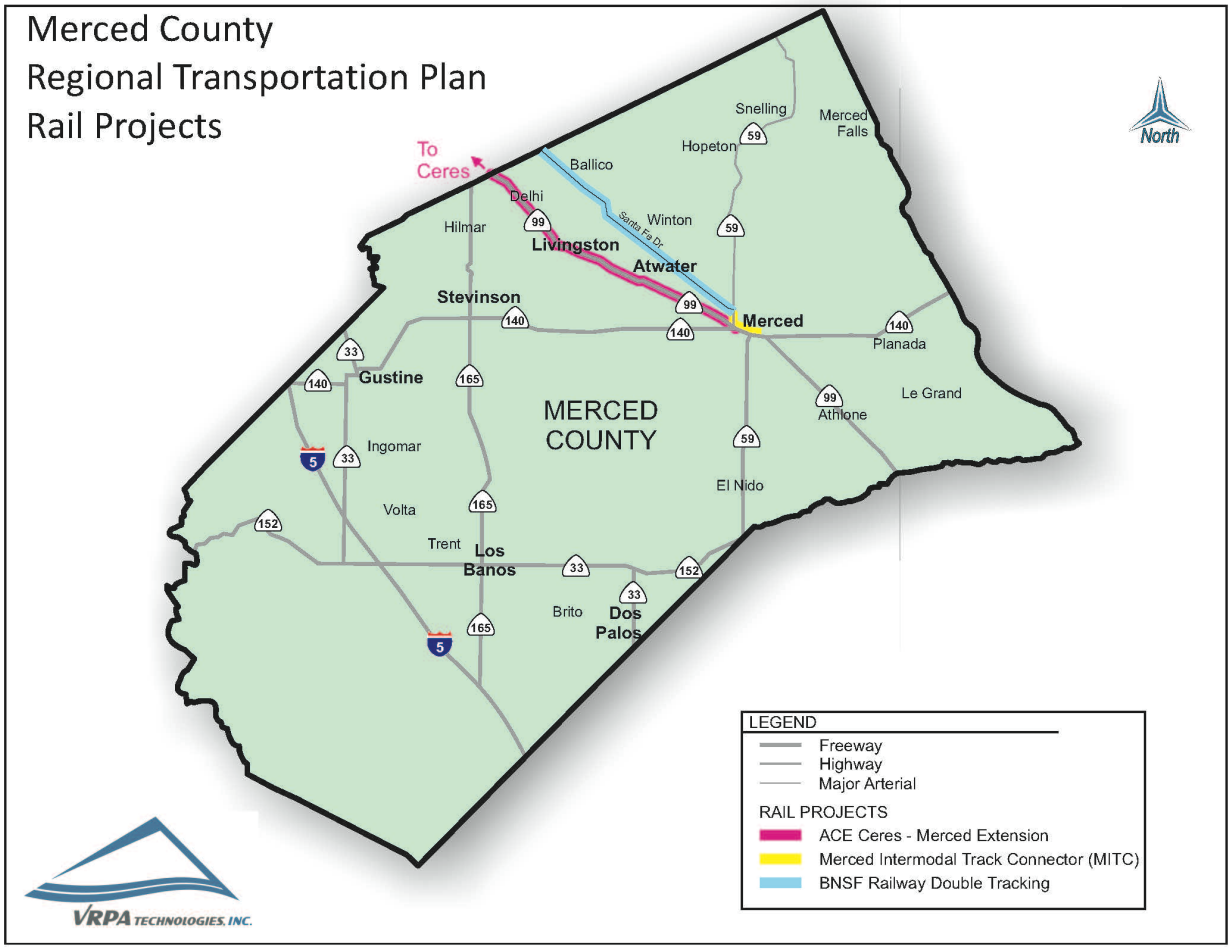
TABLE 1
2022 RTP/SCS Regionally Significant Roadway Projects Amended (Phasing and Opening Year Revisions Opening Year Revisions)

Agency	Project Title	Project Description	Cost	Open to Traffic
Atwater	Bellevue Rd Realignment/Reconstruction	Realign and reconstruct Bellevue Rd between Grove Ave and Parade St	15,000,000	2027
Los Banos	Pioneer Rd Improvements, Phase 2	Improvements and extension of Pioneer Road from SR-152/Merced College to Pioneer Road/Ward Road	45,000,000	2027
Los Banos	Mercey Springs Road (SR-165) Widening Segment 1	Widen 2 to 4 lanes from Pioneer Road to SR-152 (Pacheco Blvd)	15,000,000	2030
Los Banos	Mercey Springs Road (SR-165) Widening Segment 2	Widen 2 to 4 lanes from SR-152 (Pacheco Blvd) to Henry Miller Rd	30,000,000	2035
Merced	Mission Ave Widening Segment 1	Widen 2 to 4 lanes from Henry St to G St	30,000,000	2028
Merced	Mission Ave Realignment	G St to approx 1500 ft west of SR-59	5,000,000	2035
Merced	SR-59 Black Rascal Bridges: Replacement & Widening	Replace and widen 2 bridges on SR-59 over Black Rascal Creek with improvements to approaches	10,000,000	2027
Merced	SR-59 Merced Widening Phase 1	Widen 2 to 4 lanes from 16th St to Olive Ave/Santa Fe Dr	20,000,000	2027
Merced	SR-59 Merced Widening Phase 2	Widen 2 to 4 lanes from Black Rascal Creek Bridges to Yosemite Ave	19,000,000	2035
Merced	SR-59 Merced Widening Phase 3	Widen 2 to 4 lanes from Yosemite Ave to Cardella Rd	30,000,000	2040
Merced	SR-59 Merced Widening Phase 4	Widen 2 to 4 lanes from Cardella Rd to Bellevue Rd	30,000,000	2045
Merced	Bellevue Rd Widening	Widen from 2 to 4 lanes from SR-59 to Lake Rd	75,000,000	2035
Merced Count	Atwater-Merced Expressway Phases 1B & 2	Four-lane expressway from Greens Sands Ave to Connection with Bellevue Rd	79,000,000	2027
Merced Count	Campus Parkway Phases 2 and 3	Four-lane expressway from Childs Ave to Yosemite Ave	90,000,000	2022
Merced Count	Campus Parkway Phase 4	Four-lane expressway from Yosemite Ave to Bellevue Rd	25,000,000	2028
Caltrans	SR-99 "Livingston Widening" N/B	In and near the City of Livingston to Stanislaus County Line, widen N/B Route 99 from two to three lanes Between Merced/Stanislaus County Line to N/B off-ramp from Hammatt Ave (Livingston) - already open to traffic	35,000,000	2022
Caltrans	SR-99 "Livingston Widening" S/B	In and near the City of Livingston to Stanislaus County Line, widen S/B Route 99 from two to three lanes Between Merced/Stanislaus County Line to S/B on-ramp from Hammatt Ave (Livingston)	34,000,000	2022
Caltrans	SR-99 "Atwater Widening" (4F to 6F)	In and near the City of Atwater, widen Route 99 from four to six lanes Between Atwater-Merced Expressway to Atwater Blvd (West of Vine Ave)	220,000,000	2035
Caltrans	SR-99 "Merced Widening" (4F to 6F)	In and near the City of Merced, widen Route 99 from four to six lanes Between Mission Avenue Interchange to Atwater-Merced Expressway	200,000,000	2030

TABLE 2
2022 RTP/SCS Passenger Rail Project Revisions

Projects	Cost (millions)
ACE Ceres-Merced Extension	
Extension:	$ 391.2
Merced Layover Facility:	$ 85.0
Environmental	$ 1.4
Design	$ 21.0
Right-of-way	$ 35.8
Construction	$ 418.0
Subtotal:	**$ 476.2**
Merced Intermodal Track Connector (MITC)	
Environmental	$ 6.1
Design	$ 13.3
Right-of-way	$ 60.4
Construction	$ 174.4
	$ 254.2
BNSF Railway Double Tracking Project	
Environmental	$ 0.5
Design	$ 12.8
Right-of-way	$ -
Construction	$ 155.7
	$ 169.0
Total Cost for Capital Projects:	**$ 899.4**
Funding Outlook	
State Funding Sources:	
ITIP	$ 50.0
SB-1 (TCEP, TIRCP, Congested Corridors, etc)	$ 300.0
Other (PTA, SRA, Port and Freight, etc)	$ 80.0
Federal Funding Sources:	
FTA	$ 100.0
Federal Discretionary Programs	$ 255.0
Corridor ID / Federal-State Intercity Rail Partnership	$ 114.4
Total:	**$ 899.4**

FIGURE 1
2022 RTP/SCS Passenger Rail Project Additions



5. FINDINGS OF THE EIR

CEQA requires that a Final EIR be prepared, certified, and considered by decision-makers prior to acting 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 PEIR prepared for the 2022 RTP/SCS, therefore, represents the culmination of all environmentally related issues raised during the comment period on the Draft PEIR. In addition, the Final PEIR 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 PEIR are implemented. The Final PEIR for the 2022 RTP/SCS is composed of the following documents:

- ✓ MCAG 2022 Regional Transportation Plan/Sustainable Communities Strategy, Draft Program Environmental Impact Report, June 20, 2022
- ✓ MCAG Regional Transportation Plan/Sustainable Communities Strategy, Final Program Environmental Impact Report, August 18, 2022
- ✓ Final MCAG 2022 Regional Transportation Plan/Sustainable Communities Strategy, August 18, 2022
- ✓ Final Merced County Conformity Analysis, August 18, 2022
- ✓ Final MCAG 2023 Federal Transportation Improvement Program (FTIP)

The summary of mitigation measures and the mitigation monitoring program identified in the Draft and Final 2022 RTP/SCS PEIR remain applicable considering changes reflected in this Addendum PEIR.

6. CHANGES TO THE 2022 RTP/SCS

The purpose of this PEIR Addendum is to reflect changes and additions to the previously certified 2022 RTP/SCS PEIR. Considering CEQA provisions detailed previously, the 2022 RTP/SCS Amendment No.1 will not result in further environmental impacts based upon the following conclusions:

- ✓ 2022 RTP/SCS Amendment No.1 will not cause additional significant environmental effects addressed in the PEIR other than those already identified;
- ✓ The effects referenced in the 2022 RTP/SCS PEIR will not be substantially more severe as a result of changes identified in the 2022 RTP/SCS Amendment No.1; and
- ✓ Mitigation measures contained in the 2022 RTP/SCS PEIR would continue to be feasible and would reduce environmental effects of changes referenced in this PEIR Addendum.

While the proposed changes to the 2022 RTP/SCS may represent "*New information of substantial importance*…" as stated in Section 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 2022 RTP/SCS EIR. Based upon the findings described above, RTP/SCS Amendment No.1 will not require major revisions of the 2022 RTP/SCS PEIR for the following reasons:

- ✓ Potential impacts and mitigation factors have been adequately addressed in the certified 2022 RTP/SCS PEIR and reviewed in this PEIR Addendum;
- ✓ Each individual transportation project referenced in the 2022 RTP/SCS and in RTP/SCS Amendment No.1 will be evaluated by the responsible state, regional or local agency to identify potential environmental effects; and
- ✓ After reviewing CEQA Section 15164, it has been determined that the obligation to prepare a Supplemental or Subsequent EIR is not met.

Changes to the timing of projects and the two (2) new projects reflected in Table 1 do not change environmental analysis contained in the PEIR for the base or current year (2022) or the RTP/SCS Horizon Year of 2046. The environmental areas that require interim year analysis include both Air Quality and Climate Change (Sections 3.4 and 3.6 of the Draft PEIR). The addition of passenger rail projects will affect the following environmental sections including Air Quality, Climate Change, Energy, Noise, and Transportation sections or Sections 3.4, 3.6, 3.8, 3.13, and 3.17 in the PEIR. To reflect the most current environmental analysis provisions, the same sections have been revised and incorporated in full into this section of the Addendum PEIR for ease of reference. In addition, where table results with Amendment No. 1 have changed, the original table from the certified 2022 RTP/SCS PEIR is also provided below it to compare results. In almost all cases, changes are insignificant, or impacts are reduced with Amendment No. 1. As a result of these analyses, changes reflected in the 2022 RTP/SCS Amendment No.1 will not cause additional significant environmental effects referenced in the 2022 RTP/SCS PEIR.

7. ENVIRONMENTAL ISSUE AREAS

7.1 Aesthetics

Potential significant impacts discussed in the 2022 RTP/SCS PEIR include degradation of the existing visual character or quality of a project site and its surroundings, adverse effects on a scenic vista, damage to scenic resources, creating a new source of substantial light affecting day or nighttime views and affecting shadow sensitive uses (reference the 2022 RTP/SCS PEIR, pages 3-7 through 3-22). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency for each project. The analysis in the 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. As a result, changes to the 2022 RTP/SCS Project List identified in Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to aesthetics beyond those already described in the previously certified 2022 RTP/SCS PEIR. Thus, incorporation of the proposed changes to the Project List, contained in the Amendment No.1, would not result in any new significant impacts to aesthetics, or a substantial

increase in the severity of impacts to aesthetics beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.2 Agriculture and Forestry Resources

The implementation of transportation projects and future development assumed in the 2022 RTP/SCS would have the potential to convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) to non-agricultural use, conflict with existing zoning for agricultural use or a Williamson Act contract, conflict with existing zoning for, or cause rezoning of, forest land or timberland zoned timberland production, lose forest land or convert forest land to non-forest use and change the existing environment which, due to their location or nature, would result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use (reference the 2022 RTP/SCS PEIR, pages 3-23 through 3-49). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency for each project. As a result, the proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to agriculture and forestry resources beyond those already described in the previously certified 2022-2046 RTP/SCS PEIR. The analysis in the 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List, contained in the Amendment No.1, would not result in any new significant impacts to agriculture and forestry resources, or a substantial increase in the severity of impacts to agriculture and forestry resources beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.3 Air Quality

The 2022 RTP/SCS PEIR identified that implementation of the 2022 RTP/SCS would result in less than significant impact to air quality related to the potential to conflict with or obstruct implementation of the adopted SIPs/AQMPs/Attainment Plans in the MCAG region and increase of any criteria pollutant for which the region is nonattainment under applicable NAAQs or CAAQS but would result in significant impacts to air quality related to the potential to violate air quality standards or contribute substantially to an air quality violation and increase cancer risks due to exposure of substantial pollutant concentrations to sensitive receptors (see 2022 RTP/SCS PEIR, pages 3-50 through 3-122). The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No. 1 are not expected to cause any new or a substantial increase in the severity of significant impacts to air quality beyond those already identified in the previously certified 2022 RTP/SCS PEIR. Both the 2022 RTP/SCS and Amendment No. 1 meet the regional emissions and other tests set forth by the federal Transportation Conformity regulations, demonstrating the integrity of the State Implementation Plans prepared pursuant to the federal Clean Air Act for the non-attainment and maintenance areas in the MCAG region. The updated conformity analysis can be found below.

The air quality section below has been revised/updated to reflect the latest impact results reflective of the 2022 RTP/SCS and Amendment No.1. The section describes the environmental and regulatory setting for air quality in the Merced County region and analyzes the potential air quality impacts

resulting from the implementation of MCAG's 2022 RTP/SCS Amendment No.1. The section portrays the existing air quality conditions in the Merced County region, related air quality regulations, the air quality impacts of project construction and operation. Mitigation measures required to reduce impacts have not been revised since no additional impacts have occurred.

As noted previously, where table results with Amendment No. 1 have changed, the original table from the certified 2022 RTP/SCS PEIR is also provided below it to compare results. In almost all cases, changes are insignificant, or impacts are reduced with Amendment No. 1. As a result of these analyses, changes reflected in the 2022 RTP/SCS Amendment No.1 will not cause additional significant environmental effects referenced in the 2022 RTP/SCS PEIR.

Regulatory Setting

Air quality within the Merced County 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 Merced County are discussed below along with their individual responsibilities.

Federal Agencies

- ✓ **U.S. Environmental Protection Agency (EPA) and Federal Clean Air Act (CAA)** - 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 CAA Bill Amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources. The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the 1990 amendments.

  The CAA 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, carbon monoxide (CO), nitrogen dioxide, sulfur dioxide, particulate matter, and lead.

  CAA 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 Transportation Improvement Program (TIP) be demonstrated to conform to the State Implementation Plan (SIP) before the RTP and TIP are approved by the Metropolitan planning organization (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 (NAAQS). However, because the State Implementation Plan (SIP) for particulate matter 10 microns or less in diameter (PM10), particulate matter 2.5 microns or less in diameter (PM2.5), 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 CAA, 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. In the Federal Register on October 26, 2015, the EPA revised the primary and secondary standard to 0.070 parts per million (ppm) to provide increased public health protection against health effects associated with long- and short-term exposures. The previous ozone standard was set in 2010 at 0.075 ppm.

Merced County is located in a nonattainment area for the 8-hour ozone standard, 1997, 2006 and 2012 PM2.5 standards, and has a maintenance plan for PM10 standard.

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.

- ✓ **State Implementation Plan (SIP)/ Air Quality Management Plans (AQMPs)** - To ensure compliance with the NAAQS, EPA requires states to adopt SIP aimed at improving air quality in areas of nonattainment or a Maintenance Plan aimed at maintaining air quality in areas that have attained a given standard. New and previously submitted plans, programs, district rules, state regulations, and federal controls are included in the SIPs. Amendments made in 1990 to the federal CAA established deadlines for attainment based on an area's current air pollution levels. States must enact additional regulatory programs for nonattainment's areas in order to adhere with the CAA Section 172. In California, the SIPs must adhere to both the NAAQS and the California Ambient Air Quality Standards (CAAQS).

  To ensure that State and federal air quality regulations are being met, Air Quality Management Plans (AQMPs) are required. AQMPs present scientific information and use analytical tools to identify a pathway towards attainment of NAAQS and CAAQS. The San Joaquin Valley Air Pollution Control District (SJVAPCD) develops the AQMPs for the region where the Merced County Association of Governments (MCAG) operates. The regional air districts begin the SIP process by submitting their AQMPs to the California Air Resources Board (CARB). CARB is responsible for revising the SIP and submitting it to EPA for approval. EPA then acts on the SIP in the Federal

Register. The items included in the California SIP are listed in the Code of Federal Regulations Title 40, Chapter 1, Part 52, Subpart 7, Section 52.220.

✓ **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 EPA, following the passage of amendments to the CAA 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.

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.

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 PM2.5; and has a maintenance plan for PM10. The urbanized/metropolitan areas of Kern, Fresno, Stanislaus and San Joaquin Counties have attained the CO standard and maintained attainment for 20 years, thus conformity requirements for CO no longer apply. Transportation plans, programs and projects for the Merced County non-attainment area must satisfy the requirements of the Federal transportation conformity regulations.

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.
- 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 CAA 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.

- ✓ **Transportation Control Measures** - One particular aspect of the SIP development process is the assessment of available transportation control measures (TCMs) as a part of making progress towards clean air goals. TCMs are defined in Section 108(f)(1) of the CAA and are strategies designed to reduce vehicle miles traveled, vehicle idling, and associated air pollution. These goals are generally 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.

- ✓ **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 alternative fueled vehicles (AFVs). States are also required by the act to consider a variety of incentive programs to help promote AFVs.

- ✓ **Mobile Source Air Toxics (MSAT)** - Several mobile source emissions control programs were adopted by the U.S. EPA. These include:

  - ➢ Control of Hazardous Air Pollutants from Mobile Sources – This rule was finalized in February 2007. It aims to reduce hazardous air pollutants from mobile sources by limiting the benzene content of gasoline and reducing the toxic emissions allowable from gas cans and passenger vehicles. The EPA predicts that total emissions from mobile sources will be reduced by 330,000 tons and the volatile organic compounds (VOC) emissions will be reduced by over 1 million tons by 2030 as a result of the implementation of this rule.
  - ➢ Heavy-Duty Onboard Diagnostic Rule (74 FR 8310) – This rule, finalized in 2009, requires that advanced emissions controls systems be monitored for malfunctions with an onboard diagnostic system (OBD). It requires manufacturers to install OBD systems to monitor the function of components of the emissions control systems and notify the user when an emission related repair is necessary.
  - ➢ Small SI and Marine SI Engine Rule (73 FR 25098) – These exhaust emissions standards went into effect in 2010 regulating new marine spark-ignition engines. This rule included the first EPA standards for sterndrive and inboard engines. In 2011 and 2012, exhaust emission standards were applied to new land based, spark ignition engines at or below 19 kilowatts (kW). The majority of these small engines are used in lawn and garden applications. This rule is anticipated to reduce 604,000 tons of volatile organic hydrocarbon emissions, 132,200 tons of nitrogen oxide (NOx) emissions, and 5,500 tons of directly emitted particulate matter emissions annually.
  - ➢ Locomotive and Commercial Marine Rule (66 FR 5002) – This rule applies to all locomotives, including line-haul, switch, passenger, and all types of marine diesel engines below 30 liters per cylinder displacement, including commercial and recreational, propulsion, and auxiliary.

Enacted in 2009, the near-term program establishes new emissions limits for existing locomotives and marine diesel engines. This emission limits apply when the engine was manufactured and take effect as soon as remanufacture systems become available. Application of high-efficiency catalytic after treatment technology are the basis of long-term emission standards for new locomotives and marine diesel engines.

- Clean Air Nonroad Diesel Rule (65 FR 6698) – This comprehensive national program was established in 2004. It regulates nonroad diesel engines and diesel fuel as a system. The new engine standards began phasing into the industry in the 2008 model year. The use of advanced exhaust emission control devices is the basis for these standards.
- Heavy-Duty Engine and Vehicle Standards and Highway Diesel Fuel Sulfur Control Requirements (66 FR 5002) – These requirements, established in 2001, regulate heavy-duty vehicles and its fuel as a single system. In model year 2007, new emission standards took effect that apply to heavy-duty engines and vehicles. The use of advanced exhaust emission control devices is the basis for these standards.
- New Source Performance Standards (NSPS) for Stationary Engines. – Diesel engines used for nonroad purposes, like construction equipment, agricultural equipment, airport ground service equipment, or utility equipment, are subject to several Tiers of regulation as a result of these regulations. Tier 1 was published in 1996 and established the first set of emission regulations for these engines. Tier 4 required all manufactures to produce new engines with advanced emission control systems and began phasing into effect for all engines in 2017.

<u>State Agencies</u>

- ✓ **California Air Resources Board (CARB)** – 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. CARB was created in 1967 from the merging of the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory.

CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the EPA. Whereas CARB 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. CARB 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 CARB, and attainment plans adopted by the Air Pollution Control Districts (APCDs) and Air Quality Management District's (AQMDs) and approved by CARB.

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 CARB to "identify" and "classify" each air basin in the State on a pollutant-by-pollutant basis. Subsequently, CARB designated areas in California as nonattainment

based on violations of the CAAQSs. Designations and classifications specific to the San Joaquin Valley Air Basin (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 CARB duties include monitoring air quality. CARB has established and maintains, in conjunction with local APCDs and AQMDs, a network of sampling stations (called the State and Local Air Monitoring [SLAMS] network), which monitor the present pollutant levels in the ambient air.

Merced County is in the CARB-designated, SJVAB. A map of the SJVAB is provided in Figure 2. In addition to Merced County, the SJVAB includes Fresno, Kern, Kings, Madera, San Joaquin, Stanislaus, and Tulare Counties. Federal and State standards for criteria pollutants are provided in Table 3.

State Regulations

- ✓ **CARB Mobile-Source Regulation** - The State of California is responsible for controlling emissions from the operation of motor vehicles in the State. Rather than mandating the use of specific technology or the reliance on a specific fuel, CARB's motor vehicle standards specify the allowable grams of pollutant per mile driven. In other words, the regulations focus on the reductions needed rather than on the manner in which they are achieved.

- ✓ **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 Federal CAA. CARB is the agency responsible for administering the CCAA. CARB established ambient air quality standards pursuant to the CH&SC [§39606(b)], which are similar to the federal standards. The SJVAPCD is one of 35 AQMDs that have prepared air quality management plans to accomplish a five percent (5%) 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 CARB to designate substances as TACs. This includes research, public participation, and scientific peer review before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs and has adopted EPA's list of Hazardous Air Pollutants (HAPs) as TACs. Once a TAC is identified, CARB 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. CARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators).

These rules and standards provide for:

- More stringent emission standards for some new urban bus engines, beginning with 2002 model year engines.
- Zero-emission bus demonstration and purchase requirements applicable to transit agencies
- 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.).

FIGURE 2
California Air Basins

TABLE 3
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) [8]	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)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10) [9]	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) [9]	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) [10]	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) [11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	--	Ultraviolet Fluorescence; 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 cetain areas) [11]	--	
	Annual Arithmetic Mean	--		0.030 ppm (for cetain areas) [11]	--	
Lead [12,13]	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 [14]	8 Hour	See footnote 14	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 [12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

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 October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.

- ✓ **Mulford-Carrell Act of 1967** - CARB was established by the State Legislature through the Mulford-Carrell Act in 1967 (Health & Safe Code, § 39011, 39301), which combined the Bureau of Air Sanitation and the Motor Vehicle Pollution Control Board within the Department of Health. The State of California is responsible for developing programs and strategies to reduce the emission of smog-forming pollutants and toxics by mobile sources. CARB develops air quality regulations at the State level, which mirror federal regulations by establishing industry-specific pollution controls for criteria, toxic, and nuisance pollutants. CARB is responsible for setting standards and regulations to attain the maximum degree of emissions reduction possible from vehicular and other mobile sources. California also requires areas to develop plans and strategies for attaining

the CAAQS as specified in the CCAA. In more recent development, CARB has increased efforts in the implementation and development of standards for greenhouse gas emissions associated with climate changes.

- ✓ **Assembly Bill No.1807 (AB 1807), 1983 – TAC Regulations** - AB 1807 (Stats. 1983, Ch. 1047) (Health & Safe Code, § 39650 et seq.; Food & Ag. Code, § 14021 et seq.) establishes a procedure to identify and control TACs in California. The Air Toxics Hot Spots Information and Assessment Act, also known as AB 2588 (Stats. 1987, Ch. 1257), supplements the AB 1807 program, by mandating a statewide TAC inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks. Senate Bill (SB) 1731 amends the "Hot Spots" Program and requires OEHHA to adopt risk assessment guidelines for the program.

  The Air Toxics Hot Spots Program Guidance Manual was revised to include finding in the use of age-sensitivity factors for estimating cancer risk, breathing rates, and the fraction of time residents spend at home; changes to the duration of exposure for residents and workers; and the incorporation of uncertainty factors into reference exposure levels. Approved by the EPA, the update also included the release of the Hot Spots Analysis and Reporting Program, Version 2 (HARP 2) software package, which includes the AERMOD air pollutant dispersion model and as a result, emission sources can detect a substantially higher health risk for residential uses and other sensitive receptors. Additionally, SB 352; Stats. 2003, Ch. 668) (Ed. Code, § 17213; Pub. Resources Code, § 21151.8) demands that any school site located within 500 feet of the edge of the closest travel lane of a freeway or other busy traffic corridor be reviewed for potential short-term and long-term health risks.

  In the last ten years of the analysis of relevant data, a considerable link to adverse health effects with traffic generated TACs has been identified. As a response, publication such as the CARB Handbook was developed to provide guidance on land use compatibility with sources of TACs (CARB, 2005). The CARB Handbook is not a law or adopted policy but offers advisory recommendations for the siting of sensitive receptors near uses associated with TACs, such as freeways and high-traffic roads, commercial distribution centers, rail yards, ports, refineries, dry cleaners, gasoline stations, and industrial facilities, to protect children and other sensitive populations. Together, the Guidance Manual and CARB Handbook are important tools for planning healthy communities because they assist in assessing and identifying the risks from toxic air emissions and reducing future exposure risk through careful consideration of sensitive land uses.

- ✓ **Executive Order (EO) B-32-15, Sustainable Freight Transport Initiative** – Governor Brown signed Executive order B-32-15 on July 17, 2015 to require the Secretary of the California State Transportation Agency, the Secretary of Cal/EPA, and the Secretary of the Natural Resources Agency to lead other relevant State departments including the CARB, the Caltrans, the California Energy Commission (CEC), and the Governor's office of Business and Economic Development to improve freight efficiency, transition to zero-emission technologies, and increase competition of the State's freight system.

- ✓ **California Wellness Plan** – The California Department of Public Health published a statewide Wellness Plan in 2014. The Plan takes into consideration the factor that contribute to an individual's health. These factors include the physical environment (housing, neighborhood, healthy food access and environment), educational attainment an employment economic status, social norms and attitudes, culture, literacy, race/ethnicity. The physical environment is also an indicator of exposure to toxins and transportation where individuals are affected on a daily basis by the air quality of their surroundings.

- ✓ **Senate Bill No. 44 (SB 44) Mobile Source Strategy** – SB 44 requires CARB to update the 2016 mobile source strategy no later than January 1, 2021, and at least every 5 years thereafter. CARB is also required to include a comprehensive strategy addressing emissions from medium- and heavy-duty vehicles in addition to recommending reasonable and achievable goals for reducing emissions from medium- and heavy-duty vehicles by 2030 and 2050, respectively. CARB will also be required to submit the updated Mobile Source Strategy to the relevant policy and fiscal committees of the Legislature.

- ✓ **Senate Bill No. 210 (SB 210) Heavy-Duty Vehicle Inspection and Maintenance Program** – SB 210 directs CARB to develop and implement a Heavy-Duty Vehicle Inspection and Maintenance Program for non-gasoline heavy duty on road motor vehicles with a gross vehicle weight rating of more than 14,000 pounds. CARB is required, within four years following the full implementation of the program, to provide two biennial reports on its internet website which include enforcement, operational downtime, and an estimate of emissions reduced and cost effectiveness.

- ✓ **CARB Air Quality and Land Use Handbook** – CARB published the Air Quality and Land Use Handbook in April 2005. The Handbook is an informational and advisory guide to evaluate and reduce air pollution impacts associated with new projects that go through the land use decision-making process. Studies indicate that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for a large fraction of the overall cancer risk from airborne toxics in the State. This document highlights the potential health impacts associated with proximity to air pollution sources and aligns with CARB's public health priorities to reduce diesel PM emissions each year.

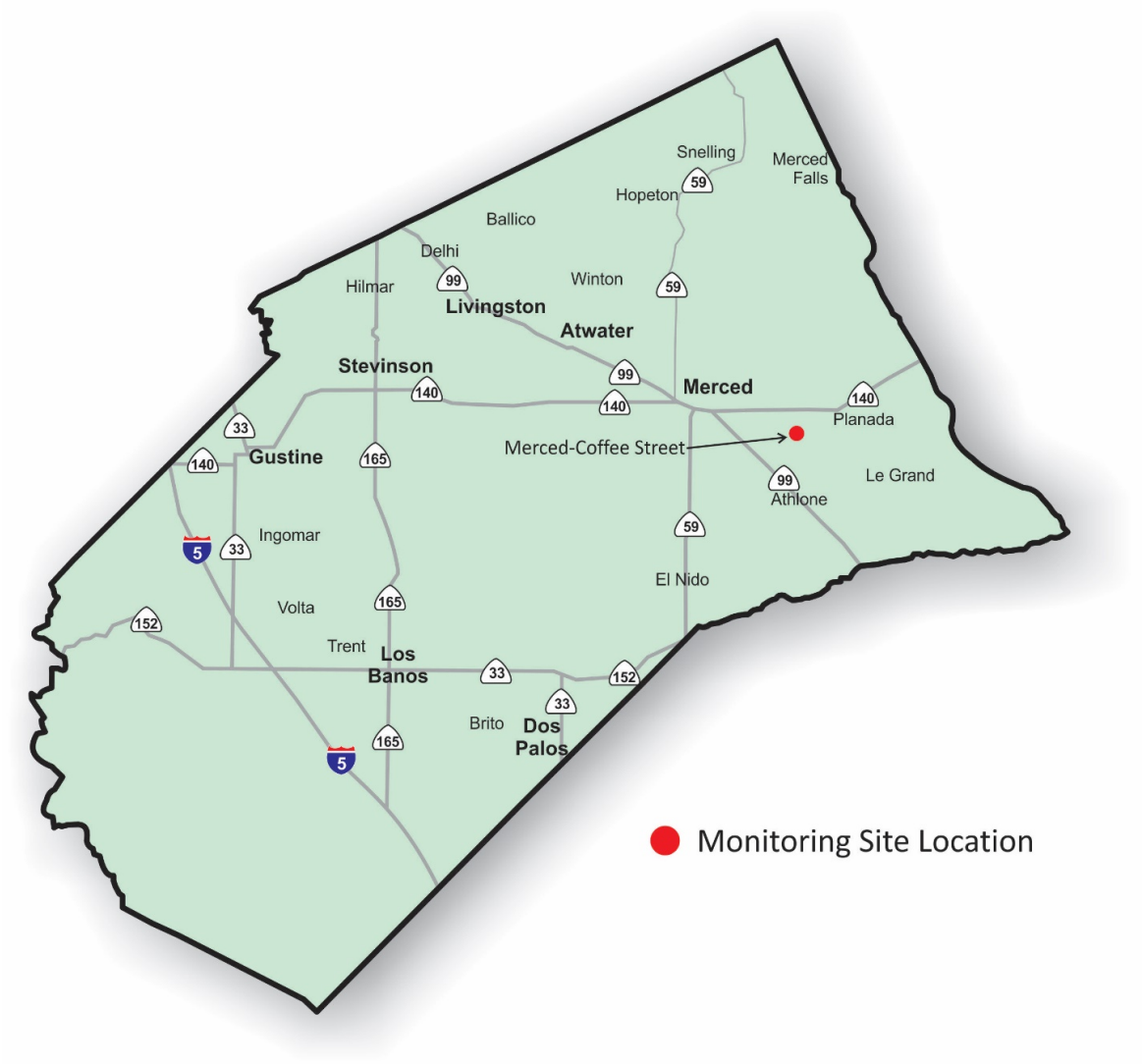
<u>Regional Agencies</u>

- ✓ **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 Merced County and throughout the SJVAB. The District also has responsibility for monitoring air quality and setting and enforcing limits for source emissions. CARB is the agency with the legal responsibility for regulating mobile source emissions. The District is precluded from such activities under State law.

  The District was formed in mid-1991 and prepared and adopted the San Joaquin Valley Air Quality Attainment Plan (AQAP), dated January 30, 1992, in response to the requirements of the State

CCAA. The CCAA requires each non-attainment district to reduce pertinent air contaminants by at least five percent (5%) per year until new, more stringent, 1988 State air quality standards are met. There is one (1) air quality-monitoring site located in Merced County, which is located along Coffee Street as illustrated in Figure 3:

FIGURE 3
Air Quality Monitoring Sites



Activities of the SJVAPCD include the preparation of AQMPs, 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 Federal CAA and CCAA.

The SJVAPCD has prepared the following State Implementation Plans to address ozone, PM-10 and PM2.5 that currently apply to Merced non-attainment area:

- The 2016 Ozone Plan (2008 standard) was adopted by SJVAPCD on June 16, 2016 and subsequently adopted by ARB on July 21, 2016.
- 2013 1-Hour Ozone Plan (revoked 1997 standard) was adopted by the SJVAPCD on September 19, 2013. EPA withdrew its approval of the plan due to litigation. The District plans to submit a "redesignation substitute" to EPA to maintain its attainment status for this revoked ozone standard.
- The 2007 PM-10 Maintenance Plan (as revised in 2015) was approved by EPA on July 8, 2016 (effective September 30, 2016).
- The 2008 PM2.5 Plan (1997 Standard), as revised in 2011, was approved by EPA on November 9, 2011 (effective January 9, 2012).
- The 2012 PM2.5 Plan (as revised in 2015) was approved by EPA on August 16, 2016 (effective September 30, 2016).

In addition, the SJVAPCD is currently working on a 2017 PM2.5 SIP to address the 1997 annual PM2.5, 2006 24-hour PM2.5, and the new 2012 PM2.5annual standards (12 ug/m3). On December 22, 2017, EPA released a response to state recommendations outlining draft areas designations for the new 2015 ozone standard of 70 ppb. The SJVAPCD is currently in the process of developing a new attainment plan, as mandated under federal Clean Air Act requirements, addressing the 2015 ozone standard.

The SJVAPCD also prepared the Guide for Assessing and Mitigation Air Quality Impacts (GAMAQI), dated March 19, 2015. 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.

All SIPs for the SJV contain statewide technology controls mandated by CARB. A summary of the CARB mandated control measures applicable to the 2022 RTP/SCS can be found in the applicable SIPs as described in the Draft Conformity Analysis for the 2023 Federal Transportation Improvement Program and 2022 Regional Transportation Plan (Conformity Analysis), which is available at the MCAG RTP site.

https://www.mcagov.org/364/2022-RTP

The SJV SIPs identified above provide a pathway to achieve both State and federal air quality standards. The regulations and incentives contained in these documents must be legally enforceable and permanent. For this EIR, only on-road mobile sources are considered as the 2022 RTP/SCS Amendment No. 1 does not impact the implementation of any SJVAPCD regulations or incentives for other emissions source categories.

During the development of each SIP, CARB in consultation with SJVAPCD and SJV MPOs, sets transportation conformity budgets 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 known as “budget years" are established to ensure that the 2022 RTP/SCS Amendment No. 1 and 2023 FTIP Amendment No. 3 "conform” to the air quality goals of the region, as well as demonstrate continued progress toward attainment of the NAAQS. The term "base year" also reflects a "threshold" or "not to exceed" value against which future emissions from the 2022 RTP/SCS Amendment No. 1 are measured.

Given that each NAAQS has different attainment milestones, each SJVAPCD plan contains different “conformity budget years" in which progress must be made toward achievement of the federal standards. These years are listed below for each applicable standard. The emissions budgets in Tables 4 through 7 below reflect "thresholds" or "not to exceed" values for the applicable "budget years" for the identified pollutants. Note that the urbanized/metropolitan areas Merced County has attained the CO standard and maintained attainment for 20 years. In accordance with Section 93.102(b)(4), conformity requirements for the CO standard stop applying 20 years after EPA approves an attainment redesignation request or as of June 1, 2018. Therefore, the conformity analysis for the 2023 FTIP Amendment No. 3 and 2022 RTP Amendment No. 1 no longer includes a CO conformity demonstration.

TABLE 4
On-Road Motor Vehicle 2008 Ozone Emissions Budgets
(Summer tons/day)

County	2023		2026		2029		2031	
	ROG	NOx	ROG	NOx	ROG	NOx	ROG	NOx
Merced	1.7	6.0	1.5	5.9	1.3	5.6	1.2	5.4

Source: Federal Register / Vol. 84, No. 57 / Monday, March 25, 2019 / Rules and Regulations

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

County	2020	
	PM10	NOx
Merced	3.8	8.9

Source: Federal Register / Vol. 81, No. 156 / Friday, August 12, 2016 / Rules and Regulations

TABLE 6
On-Road Motor Vehicle 1997 and 2012 PM-2.5 Emissions Budgets
(Tons per average annual day)

County	2020		2023	
	PM2.5	NOx	PM2.5	NOx
Merced	0.3	8.9	0.3	5.3

Source: 2018 PM2.5 Plan

TABLE 7
On-Road Motor Vehicle 2006 24-Hour PM-2.5 Emissions Budgets
(Tons per average winter day)

County	2023		2024	
	PM2.5	NOx	PM2.5	NOx
Merced	0.3	5.5	0.3	5.3

Source: 2018 PM2.5 Plan

Regional Regulations

The SJVAPCD has adopted numerous rules and regulations to implement its air quality plans. Following, are significant rules that apply to the Merced County area.

- ✓ **Regulation VIII – Fugitive PM10 Prohibitions** - Regulation VIII is comprised of District Rules 8011 through 8081, which are designed to reduce PM10 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. Regulation VIII control measures are provided below:

- All disturbed areas, including storage piles, which are not being actively utilized for construction purposes, shall be effectively stabilized of dust emissions using water, chemical stabilizer/suppressant, covered with a tarp or other suitable cover or vegetative ground cover.
- All on-site unpaved roads and off-site unpaved access roads shall be effectively stabilized of dust emissions using water or chemical stabilizer/suppressant.
- All land clearing, grubbing, scraping, excavation, land leveling, grading, cut & fill, and demolition activities shall be effectively controlled of fugitive dust emissions utilizing application of water or by presoaking.
- When materials are transported off-site, all material shall be covered, or effectively wetted to limit visible dust emissions, and at least six inches of freeboard space from the top of the container shall be maintained.
- All operations shall limit or expeditiously remove the accumulation of mud or dirt from adjacent public streets at the end of each workday. The use of dry rotary brushes is expressly prohibited except where preceded or accompanied by sufficient wetting to limit the visible dust emissions. Use of blower devices is expressly forbidden.
- Following the addition of materials to, or the removal of materials from, the surface of outdoor storage piles, said piles shall be effectively stabilized of fugitive dust emissions utilizing sufficient water or chemical stabilizer/suppressant.
- Within urban areas, track out shall be immediately removed when it extends 50 or more feet from the site and at the end of each workday.

✓ **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.

✓ **Rule 9120 – Transportation Conformity** – The Transportation Conformity Rule provides policy, criteria, and procedures for demonstrating and assuring conformity of transportation plans, programs, and projects. This rule applies to projects that are developed, funded, or approved by the DOT and MPO's, or other recipients of funds under title 23 U.S.C or the Federal Transit Act (49 U.S.C. 1601 et seq.).

✓ **Rule 9410 – Employer Based Trip Reduction** – The Employer Based Trip Reduction Rule requires larger employers to establish an Employer Trip Reduction Implementation Plan (eTRIP) to encourage employees to reduce single-occupancy vehicle trips, thus reducing pollutant emissions

associated with work commutes. This rule was adopted by the District Governing Board on December 17, 2009.

- ✓ **Rule 9510 – Indirect Source Review (ISR)** - The purpose of this rule is to fulfill the District's emission reduction commitments in the PM10 and Ozone Attainment Plans, achieve emission reductions from construction activities, and to provide a mechanism for reducing emissions from the construction of and use of development projects through off-site measures. The proposed Project will be required to comply with this regulation.

Environmental Setting

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

Topographic Conditions

Merced County is located within the SJVAB as determined by 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 Tehachapi's 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

Merced 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 Merced 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, CO, for example, may form high concentrations when wind speed is low. During the winter, Merced 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. PM10 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, Merced County in the center, receives about 13 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 Fog. 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 PM10. 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 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 PM10 and PM2.5 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.

CO emissions overwhelmingly come from mobile sources in the San Joaquin Valley; on-road vehicles contributed 33 percent, while other mobile vehicles, such as trains, planes, and off-road vehicles, contribute another 41 percent in 2017 according to emission projections from CARB. 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 NOx and Reactive Organic Gases (ROG). Mobile sources contribute 84 percent of all NOx emitted from anthropogenic sources based on data provided in Appendix B of the Air District's *2016 Ozone Plan* and 2017 emission projections from CARB. In addition, mobile sources contribute 24 percent (2017 emission projections) of all the ROG emitted from sources within the San Joaquin Valley.

The principal factors that affect air quality in and around Merced 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. Merced 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 Merced County consist of agricultural production and processing operations, wine production, and marketing operations.

The primary contributors of PM10 emissions in the San Joaquin Valley are farming activities (32%) and road dust, both paved and unpaved (26%) in 2017 according to emission projections from CARB. Fugitive windblown dust from "open" fields contributed 16 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 Merced County, including areas north and west of the San Joaquin Valley, can cause or generate emissions that are transported into Merced 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.

- ✓ **Construction Activities** - 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. Exhaust pollutants are the non-useable gaseous waste products produced during the combustion process. Engine exhaust contains CO, HC, and NOx pollutants which are harmful to the environment.

- ✓ **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 Merced 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 Merced County consist of agricultural production and processing operations, wine production, and marketing operations.

<u>San Joaquin Valley Air Basin Monitoring</u>

The SJVAB consists of eight counties, from San Joaquin County in the north to Kern County in the south. The 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 transportation conformity purposes. Data obtained from the monitoring sites throughout the SJVAB between 2016 and 2020 is summarized in Tables 8 through 10. Table 11 reflects the ambient air quality classifications for the lone monitoring site in Merced County. Table 12 identifies Merced County's attainment status. As indicated, Merced County is nonattainment for Ozone (8 hour) and PM2.5 and has a maintenance plan for PM10. In accordance with the Federal CAA, EPA uses the design value at the time of standard promulgation to assign nonattainment areas to one of several classes that reflect the severity of the nonattainment problem; classifications range from marginal nonattainment to extreme nonattainment. The Federal CAA 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 8
SJVAB Ambient Air Quality Monitoring Data Summary - Ozone 2016-2021

Year	Days > Standard				1-Hour Observations			8-Hour Observations					
	State		National			State	Nat'l	State		National		Coverage	
	1-Hr	8-Hr	1-Hr	8-Hr	Max.	D.V.[1]	D.V.[2]	Max.	D.V.[1]	Max.	D.V.[2]	Min	Max
2021	23	80	*1.0*	77	*0.125*	0.12	*0.120*	0.100	0.104	0.100	0.093	0	100
2020	35	88	*2.1*	86	*0.142*	0.12	*0.121*	0.114	0.104	0.114	0.093	0	100
2019	13	60	*0.0*	59	*0.110*	0.11	*0.116*	0.094	0.096	0.093	0.088	81	99
2018	27	87	*1.0*	82	0.129	0.12	*0.120*	0.102	0.101	0.101	0.090	86	100
2017	21	87	*1.1*	85	0.143	0.12	*0.120*	0.113	0.102	0.112	0.092	84	100
2016	28	91	*1.0*	87	*0.131*	0.12	*0.117*	0.101	0.103	0.101	0.094	93	100

Notes:

All concentrations expressed in parts per million.

The national 1-hour ozone standard was revoked in June 2005. Statistics related to the national 1-hour 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 9
SJVAB Ambient Air Quality Monitoring Data Summary – PM-2.5 2016-2021

Year	Est. Days > Nat'l Std.	Annual Average		Nat'l Ann. Std. D.V.[1]	State Annual D.V.[2]	Nat'l Std. 98th Percentile	Nat'l 24-Hr Std. D.V.[1]	High 24-Hour Average		Year Coverage	
		Nat'l	State					Nat'l	State	Min	Max
2021	53.0	20.7	16.6	17.8	20	69.3	66	556.7	129.2	14	100
2020	52.0	20.3	20.3	17.6	20	99.5	72	199.7	219.4	6	100
2019	21.0	13.0	13.0	16.9	19	46.7	64	83.7	83.7	75	100
2018	42.3	19.4	18.6	17.8	19	100.4	65	189.8	257.5	79	100
2017	33.8	18.2	16.8	17.3	18	74.6	72	113.4	113.4	82	100
2016	25.5	15.9	16.0	18.4	19	51.4	72	66.4	66.4	86	100

Notes:

All average concentrations expressed in micrograms per cubic meter.

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 10
SJVAB Ambient Air Quality Monitoring Data Summary – PM-10 2016-2021

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
2021	16.3	151.7	*54.9*	52.8	*56*	61	437.5	439.3	0 - 97
2020	38.7	157.0	*64.5*	60.5	*56*	61	517.2	359.0	0 - 100
2019	16.2	129.7	*55.6*	55.6	*52*	56	652.2	664.2	0 - 100
2018	9.6	164.4	*54.5*	53.0	*50*	53	250.2	250.4	0 - 100
2017	7.7	145.5	*55.3*	48.4	*46*	48	298.4	210.0	0 - 100
2016	0.0	157.9	*50.0*	47.3	*46*	48	152.2	132.5	0 - 100

Notes:

All average concentrations expressed in micrograms per cubic meter.

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*.

An exceedence of a standard is not necessarily related to a violation of the standard.

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.

TABLE 11
Maximum Pollutant Levels at Merced's S Coffee Avenue Monitoring Station

Pollutant	Time Averaging	2018 Maximums	2019 Maximums	2020 Maximums	2021 Maximums	Standards National	Standards State
Ozone (O_3)	1 hour	0.104 ppm	0.087 ppm	0.100 ppm	0.099 ppm	-	0.09 ppm
Ozone (O_3)	8 hour	0.083 ppm	0.076 ppm	0.087 ppm	0.089 ppm	0.070 ppm	0.070 ppm
Nitrogen Dioxide (NO_2)	1 hour	45.0 ppb	38.0 ppb	38.0 ppb	38.0 ppb	100 ppb	0.18 ppm
Nitrogen Dioxide (NO_2)	Annual Average	7.0 ppb	6.0 ppb	6.0 ppb	*	0.053 ppm	0.030 ppm
Particulates (PM_{10})	24 hour	*	*	*	*	150 µg/m^3	50 µg/m^3
Particulates (PM_{10})	Federal Annual Arithmetic Mean	*	*	*	*	-	20 µg/m^3
Particulates ($PM_{2.5}$)	24 hour	88.2 µg/m^3	35.5 µg/m^3	117.4 µg/m^3	77.3 µg/m^3	35 µg/m^3	-
Particulates ($PM_{2.5}$)	Federal Annual Arithmetic Mean	15.1 µg/m^3	9.1 µg/m^3	14.6 µg/m^3	11.2 µg/m^3	12 µg/m^3	12 µg/m^3

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

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

TABLE 12
Merced County Attainment Status

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

Source: ARB Website, 2023

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.

Air Quality Standards

The Federal CAA, first adopted in 1963, and periodically amended since then, established the NAAQS. A set of 1977 amendments determined a deadline for the attainment of these standards. That deadline has since passed. Other Federal 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 CAAQS. CARB implements State ambient air quality standards, as required in the CCAA, and cooperates with the federal government in implementing pertinent sections of the Federal CAA Amendments (FCAAA). Further, CARB regulates vehicular emissions throughout the State. The SJVAPCD regulates stationary sources, as well as some mobile sources. Attainment of the more stringent State PM10 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 criteria pollutants as well as other pollutants of importance in Merced County are as follows.

- ✓ **Ozone (O3)** - 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 Merced 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, lung tissue damage, and a reduction in the amount of air inhaled into the lungs.

CARB found ozone standards in Merced County nonattainment of Federal and State standards.

- ✓ **Suspended PM (PM10 and PM2.5)** - 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. PM10 refers to particles less than or equal to 10 microns in aerodynamic diameter. PM2.5 refers to particles less than or equal to 2.5 microns in aerodynamic diameter and are a subset of PM10. 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 PM10 in both urban and rural areas. Because particles originate from a variety of sources, their chemical and physical compositions vary widely. The composition of PM10 and PM2.5 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 PM10 and PM2.5. In addition to those listed previously, secondary particles can also be formed as precipitates from chemical and photochemical reactions of gaseous sulfur dioxide (SO2) and NOx in the atmosphere to create sulfates (SO4) and nitrates (NO3). Secondary particles are of greatest concern during the winter months where low inversion layers tend to trap the precursors of secondary particulates.

  Health Effects

  PM10 and PM2.5 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. PM10 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. PM10 and PM2.5 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 PM10. 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 PM10 exposure to the premature death of people who already have heart and lung disease, especially the elderly. Acidic PM10 can also damage manmade materials and is a major cause of reduced visibility in many parts of the United States.

CARB found PM10 standards in Merced County in attainment of Federal standards and nonattainment for State standards. CARB found PM2.5 standards in Merced 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.

  As mentioned above, Merced County is unclassified/attainment for Federal standards and unclassified for State standards for CO.

- ✓ **Nitrogen Dioxide (NO2)** - NOx 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. NOx 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, NOx is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates.

  Health Effects

  NOx 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 NOx can also cause a wide range of health effects. NOx 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 (NO2) 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 NO2 may lead to increased susceptibility to respiratory infection and may cause irreversible alterations in lung structure. Other health effects associated with NOx are an increase in the incidence of chronic bronchitis and lung irritation. Chronic exposure to NO2 may lead to eye and mucus membrane aggravation, along with pulmonary dysfunction. NOx can cause fading of textile dyes and additives, deterioration of cotton and nylon, and corrosion of metals due to production of particulate nitrates. Airborne NOx can also impair visibility. NOx is a major component of acid deposition in California. NOx may affect both terrestrial and aquatic ecosystems. NOx 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.

  NO2 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 NO2 include experimental studies on animals, controlled laboratory studies on humans, and observational studies.

  In animals, long-term exposure to NOx 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 NO2, can suffer lung irritation and, potentially, lung damage. Epidemiological studies have also shown associations between NO2 concentrations and daily mortality from respiratory and cardiovascular causes as well as hospital admissions for respiratory conditions.

  NOx 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.

CARB found NO2 standards in Merced County as unclassified/attainment of Federal standards and attainment for State standards.

- ✓ **Sulfur Dioxide (SO2)** - The major source of sulfur dioxide (SO2) is the combustion of high-sulfur fuels for electricity generation, petroleum refining and shipping. High concentrations of SO2 can result in temporary breathing impairment for asthmatic children and adults who are active outdoors. Short-term exposures of asthmatic individuals to elevated SO2 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 SO2, in conjunction with high levels of PM, include aggravation of existing cardiovascular disease, respiratory illness, and alterations in the lungs' defenses. SO2 also is a major precursor to PM2.5, 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.

  CARB found SO2 standards in the Merced County as unclassified/attainment 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.

  CARB found Lead standards in Merced County as unclassified/attainment of Federal standards and attainment for State standards.

- ✓ **Toxic Air Contaminants (TAC)** - In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TAC) are another group of pollutants of concern. TAC are injurious in small quantities and are regulated despite the absence of criteria documents. The identification, regulation and monitoring of TAC is relatively recent compared to that for criteria pollutants. Unlike criteria pollutants, TAC are regulated on the basis of risk rather than specification of safe levels of contamination. The ten TAC are acetaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, perchloroethylene, and diesel particulate matter (DPM). Caltrans' guidance for transportation studies references the 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 EPA. The six-diesel exhaust (particulate matter and organic gases), benzene, 1,3-butadiene, acetaldehyde, formaldehyde, and acrolein.

  Some studies indicate that DPM poses the greatest health risk among the TAC 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 DPM 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.

  DPM differs from other TAC in that it is not a single substance but a complex mixture of hundreds of substances. Although DPM 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 TAC, however, no ambient monitoring data are available for DPM because no routine measurement method currently exists. CARB has made preliminary concentration estimates based on a DPM exposure method. This method uses the CARB emissions inventory's PM10 database, ambient PM10 monitoring data, and the results from several studies to estimate concentrations of DPM. Table 13 depicts the CARB Handbook's recommended buffer distances associated with various types of common sources. It should be noted that the recommendation to avoid siting new sensitive land uses within 500 feet of a freeway was identified in CARB's Air Quality and Land Use Handbook published in 2005. CARB recently published a technical advisory to the Air Quality and Land Use Handbook indicating that new research has demonstrated promising strategies to reduce pollution exposure along transportation corridors.

  Existing air quality concerns within Merced County and the entire SJVAB are related to increases of regional criteria air pollutants (e.g., ozone and particulate matter), exposure to toxic air contaminants, odors, and increases in greenhouse gas emissions contributing to climate change. The primary source of ozone (smog) pollution is motor vehicles. Particulate matter is caused by

dust, primarily dust generated from construction and grading activities, and smoke which is emitted from fireplaces, wood-burning stoves, and agricultural burning.

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

  With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

  Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor.

  Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air.

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

TABLE 13
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 [1]	- 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.

1: The recommendation to avoid siting new sensitive land uses within 500 feet of a freeway was identified in CARB's Air Quality and Land Use Handbook published in 2005. CARB recently published a technical advisory to the Air Quality and Land Use Handbook indicating that new research has demonstrated promising strategies to reduce pollution exposure along transportation corridors.

*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 2023

The intensity of an odor source's operations and its proximity to sensitive receptors influences the potential significance of odor emissions. The SJVAPCD has identified some common types of facilities that have been known to produce odors in the SJVAB. The types of facilities that are known to produce odors are shown in Table 3-14 along with a reasonable distance from the source within which, the degree of odors could possibly be significant. Information presented in Table 3-14 will be used as a screening level of analysis for potential odor sources for the proposed project.

TABLE 14
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 2023

- ✓ **Naturally Occurring Asbestos (NOA)** - Asbestos is a term used for several types of naturally-occurring fibrous minerals found in many parts of California. The most common type of asbestos is chrysotile, but other types are also found in California. Asbestos is commonly found in ultramafic rock and near fault zones. The amount of asbestos that is typically present in these rocks ranges from less than 1% up to approximately 25% and sometimes more. It is released from ultramafic rock when it is broken or crushed. This can happen when cars drive over unpaved roads or driveways, which are surfaced with these rocks, when land is graded for building purposes, or at quarrying operations. Asbestos is also released naturally through weathering and erosion. Once released from the rock, asbestos can become airborne and may stay in the air for long periods of time. Asbestos is hazardous and can cause lung disease and cancer dependent upon the level of exposure. The longer a person is exposed to asbestos and the greater the intensity of the exposure, the greater the chances for a health problem.

The construction phase of the projects listed in the 2022 RTP/SCS Amendment No. 1 may cause asbestos to become airborne due to the construction activities that will occur on site. The listed projects would be required to submit a Dust Control Plan under the SJVAPCD's Rule 8021.

Existing TCMs and Air Quality Mitigation

The Federal CAA 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.

A description of the applicable TCMs that have been incorporated into the applicable SIPs and also documented in the MCAG Draft Conformity Analysis for the 2022 RTP/SCS Amendment No. 1 and 2023 FTIP Amendment No. 3.

Merced County and its six 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.

Dibs and CalVans are rideshare programs that operate throughout Merced County and are administered by MCAG and San Joaquin Council of Governments (SJCOG). A complete description of the current air quality requirements is provided in the 2022 RTP and the latest Air Quality Conformity Findings which is available at the Merced COG RTP site: https://www.mcagov.org/364/2022-RTP.

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 Federal CAA and CCAA, air districts were encouraged to coordinate with RTPAs on TCM implementation and 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.

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 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 Air 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 MCAG's 2022 RTP/SCS Amendment No. 1. This analysis evaluates each significance criterion individually, assessing how implementation of MCAG's 2022 RTP/SCS Amendment No. 1, including changes to the land use pattern and transportation network, may impact the air quality in the Merced County region. The analysis for each significance criteria includes a discussion of program-level impacts for the RTP/SCS planning horizon year of 2046. Appropriate mitigation measures are applied where a significant impact has been determined.

Criteria for Significance

According to CEQA, an impact is considered significant if one or more of the following conditions occur from implementation of MCAG's 2022 RTP/SCS Amendment No. 1:

- ✓ Conflict with or obstruct implementation of the applicable air quality plan.
- ✓ 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.
- ✓ Expose sensitive receptors to substantial pollutant concentrations.
- ✓ Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Impact AQ 1 – Conflict with or obstruct implementation of the applicable air quality plan.

The following analysis is a summary of the Conformity Analysis for the 2022 RTP/SCS Amendment No. 1 and 2023 FTIP Amendment No. 3. The complete Air Quality Conformity Analysis is available on MCAG's website.

- ✓ **Merced 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 FTIP/RTP must be less than or equal to the motor vehicle emissions budget specified in the approved air quality implementation plan or the emissions budget found to be adequate for transportation conformity purposes. If there is no approved air quality plan for a pollutant for which the region is in nonattainment or no emission budget has been found to be adequate for transportation conformity purposes, the interim emission test applies. The Air Quality Conformity summarizes the applicable air quality implementation plans and conformity tests for ozone, PM_{10}, and $PM_{2.5}$.

  During the development of each SIP, CARB in consultation with SJVAPCD and SJV MPOs, sets transportation conformity budgets 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 known as “budget years" are established to ensure that the 2022 RTP/SCS Amendment No. 1 and 2023 FTIP Amendment No. 3 "conform” to the air quality goals of the region, as well as demonstrate continued progress toward attainment of the NAAQS. The term "base year" also reflects a "threshold" or "not to exceed" value against which future emissions from the 2022 RTP/SCS Amendment No. 1 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 determined. In addition, any interpolation performed to meet tests for "budget years" in which specific analysis is not required need to be documented. For the selection of the analysis years, the conformity regulation requires: (1) that if the attainment year is in the time span of the transportation plan, it must be modeled; (2) the last year forecast in the transportation plan must be an analysis year; and (3) analysis years may not be more than ten years apart. In addition, the conformity regulation requires that conformity must be demonstrated for each "budget year." It is important to note, that although the conformity regulation requires modeling of several analysis years in addition to the “budget years," those additional analysis years must demonstrate that emissions in those years are less than the applicable motor vehicle emissions "budget." For example, the 2022 RTP Amendment No. 1/2023 FTIP Amendment No. 3 conformity analysis models Ozone motor vehicle emissions for the years 2020, 2023, 2026, 2029, 2031, 2037 and 2046. Table 15 below shows 2020, 2022, 2023, 2026, 2029 are “budget years" and 2031 and 2037 are the years of attainment. As described above, Ozone emissions for the 2031, 2037, and 2046 analysis years must be less than or equal to the 2029 "budget" to demonstrate compliance with the SJVAPCD 2008 Ozone Plan.

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

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

TABLE 15
San Joaquin Valley Conformity Analysis Years

Pollutant	Budget Years[1]	Attainment/ Maintenance	Intermediate Years	RTP Horizon Year
2008 and 2015 Ozone	2020/2023/2026/ 2029	2031/2037[2]	NA	2046
PM10	N/A	2020	2023/2029/2037	2046
1997 24-hour PM2.5	N/A	2020	2023/2029/2037	2046
1997 Annual PM2.5	N/A	2023	2029/2037	2046
2012 Annual PM2.5	N/A	2022/2025[3]	2023/2029/2037	2046
2006 24-hour PM2.5	2020/2023	2024	2031/2037	2046
Upcoming PM10	N/A	2020	2023/2029/2037	2046

1 Budget years that are not in the time frame of the transportation plan/conformity analysis are not included as analysis years (e.g., 2020), although they may be used to demonstrate conformity. Some of the early RFP year budgets were not acted on by EPA since they were not applicable.

2 2031 is the attainment year for the 2008 ozone standard. 2037 is the attainment year for the 2015 ozone standard.

3 2022 is the attainment year for the moderate 2012 PM2.5 standard (not in the timeframe of this analysis). 2025 is the attaiment year for the serious 2012 PM2.5 standard.

The FCAA requires all states to attain the 1997 PM2.5 standards as expeditiously as practicable beginning in 2010, but by no later than April 5, 2010 unless EPA approves an attainment date extension. States must identify their attainment dates based on the rate of reductions from their control strategies and the severity of the PM2.5 problem. On February 9, 2016 EPA released its proposed Approval and Disapproval of California Air Plan; San Joaquin Valley Serious Area Plan and Attainment Date Extension for the 1997 PM2.5 NAAQS. No final EPA action has been taken on the plan. As a result, the proposed SIP budgets are assumed to be unavailable for use and the 2008 PM2.5 Plan conformity budgets are the only budgets applicable at this time for the 1997 PM2.5 standard.

On January 20, 2016, EPA finalized reclassification of the San Joaquin Valley to Serious nonattainment for the 2006 24-hour PM2.5 Standard. On August 16, 2016, the 2012 PM2.5 Plan was approved by EPA, effective September 30, 2016, inclusive of new conformity budgets and trading mechanism for the 2006 24-hour PM2.5 standard with a requirement to attain the standard as expeditiously as practicable and no later than December 31, 2019. In 2019, CARB submitted an attainment deadline extension request as part of the 2018 PM2.5 Plan. On March 27, EPA published a proposed rule approving portions of the 2018 PM2.5 Plan, including the 2006

PM2.5 standard attainment deadline extension, as well as conformity budgets and trading mechanism.

On April 15, 2015, EPA classified the San Joaquin Valley as Moderate nonattainment for the 2012 PM2.5 Standards. On November 26, 2021, EPA issued final rue approving of the Moderate Area 2016 PM2.5 Plan, portions of the 2018 PM2.5 SIP pertaining to moderate nonattainment of the 2012 PM2.5 standards, and the reclassification request to serious nonattainment. The San Joaquin Valley 2018 PM2.5 Plan includes serious area budgets for the 2012 PM2.5 standards with an attainment deadline of 2025; therefore, the attainment year 2025 must be modeled.

- **Ozone Precursors**

  The regional emissions analysis and forecasts for ozone precursors (ROG and NOX) are summarized in Table 16A (Amendment No. 1) and Table 16B (2022 RTP/SCS PEIR). The summary of emissions forecasts is derived from outputs of the EMFAC 2014 model performed by MCAG staff during the preparation of the Air Quality Conformity Analysis. 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 regional emissions analysis and forecasts for particulate matter (PM10 and PM2.5) are summarized in Table 16A and 16B. The summary of emissions forecasts is derived from outputs of the EMFAC 2021 model performed by MCAG staff during the preparation of the Air Quality Conformity Analysis.

✓ **Results of the Conformity Analysis**

A regional emissions analysis was conducted for the years 2023, 2026, 2029, 2031, 2037, and 2046 for each applicable pollutant. All analyses were conducted using the latest planning assumptions and emissions models. The major conclusions of the MCAG Conformity Analysis are:

- For ozone, the total regional on-road vehicle-related emissions (ROG and NOx) associated with implementation of the 2023 FTIP Amendment No. 3 and the 2022 RTP Amendment No. 1 for all years tested are projected to be less than the adequate emissions budgets specified in the *2016 Ozone Plan*. The conformity tests for ozone are therefore satisfied.
- For PM-10, the total regional vehicle-related emissions (PM-10 and NOx) associated with implementation of the 2023 FTIP Amendment No. 3 and the 2022 RTP Amendment No. 1 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 NOx trading mechanism for transportation conformity purposes from the *2007 PM-10 Maintenance Plan (as revised in 2015)*. The conformity tests for PM-10 are therefore satisfied.

TABLE 16A
Conformity Results for RTP Projects
2023 Conformity Results Summary – Merced

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		ROG (tons/day)	NOx (tons/day)	ROG	NOx
2008 and 2015 Ozone	2023 Budget	1.7	6.0		
	2023	1.7	4.8	YES	YES
	2026 Budget	1.5	5.9		
	2026	1.5	4.3	YES	YES
	2029 Budget	1.3	5.6		
	2029	1.3	3.9	YES	YES
	2031 Budget	1.2	5.4		
	2031	1.2	3.7	YES	YES
	2037	0.9	3.4	YES	YES
	2046	0.7	3.5	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM-10 (tons/day)	NOx (tons/day)	PM-10	NOx
PM-10 (2015 SIP Update)	Adjusted 2020 Budget	4.3	8.2		
	2023	4.3	5.1	YES	YES
	Adjusted 2020 Budget	4.4	8.0		
	2029	4.4	4.1	YES	YES
	Adjusted 2020 Budget	4.6	7.7		
	2037	4.6	3.5	YES	YES
	Adjusted 2020 Budget	4.7	7.6		
	2046	4.7	3.6	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
1997 24-Hour PM2.5 Standard	2020 Budget	0.3	8.9		
	2023	0.2	5.1	YES	YES
	2020 Budget	0.3	8.9		
	2029	0.2	4.1	YES	YES
	2020 Budget	0.3	8.9		
	2037	0.2	3.6	YES	YES
	2020 Budget	0.3	8.9		
	2046	0.2	3.6	YES	YES

TABLE 16A (Cont'd)
Conformity Results for RTP Projects
2023 Conformity Results Summary – Merced

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
1997 Annual PM2.5 Standard	Adjusted 2023 Budget	0.3	5.3		
	2023	0.3	4.8	YES	YES
	Adjusted 2023 Budget	0.3	5.3		
	2029	0.3	3.9	YES	YES
	Adjusted 2023 Budget	0.3	5.3		
	2037	0.3	3.4	YES	YES
	Adjusted 2023 Budget	0.3	5.3		
	2046	0.3	3.3	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
2006 PM2.5 Winter 24-Hour Standard	Adjusted 2023 Budget	0.3	5.5		
	2023	0.3	4.9	YES	YES
	Adjusted 2024 Budget	0.3	5.3		
	2024	0.3	4.7	YES	YES
	Adjusted 2024 Budget	0.3	5.3		
	2031	0.3	3.8	YES	YES
	Adjusted 2024 Budget	0.3	5.3		
	2037	0.3	3.5	YES	YES
	Adjusted 2024 Budget	0.3	5.3		
	2046	0.3	3.4	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
2012 Annual PM2.5 Standard (Moderate)	Adjusted 2022 Budget	0.3	7.6		
	2022	0.3	6.8	YES	YES
	2022 Budget	0.3	7.6		
	2025	0.3	4.4	YES	YES
	2022 Budget	0.3	7.6		
	2029	0.3	3.9	YES	YES
	2022 Budget	0.3	7.6		
	2037	0.3	3.4	YES	YES
	2022 Budget	0.3	7.6		
	2046	0.3	3.3	YES	YES

TABLE 16B
Conformity Results for RTP Projects
2022 Conformity Results Summary - Merced

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		ROG (tons/day)	NOx (tons/day)	ROG	NOx
2008 and 2015 Ozone	2023 Budget	1.7	6.0		
	2023	1.6	4.6	YES	YES
	2026 Budget	1.5	5.9		
	2026	1.4	4.1	YES	YES
	2029 Budget	1.3	5.6		
	2029	1.2	3.8	YES	YES
	2031 Budget	1.2	5.4		
	2031	1.1	3.6	YES	YES
	2037	0.9	3.3	YES	YES
	2046	0.8	3.2	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM-10 (tons/day)	NOx (tons/day)	PM-10	NOx
PM-10	Adjusted 2020 Budget	4.5	7.9		
	2022	4.5	6.8	YES	YES
	Adjusted 2020 Budget	4.6	7.7		
	2029	4.6	3.9	YES	YES
	Adjusted 2020 Budget	4.8	7.4		
	2037	4.8	3.4	YES	YES
	Adjusted 2020 Budget	4.9	7.3		
	2046	4.9	3.3	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
1997 24-Hour PM2.5 Standard	Adjusted 2020 Budget	0.3	8.9		
	2023	0.3	4.8	YES	YES
	Adjusted 2020 Budget	0.3	8.9		
	2029	0.3	3.9	YES	YES
	Adjusted 2020 Budget	0.3	8.9		
	2037	0.3	3.4	YES	YES
	Adjusted 2020 Budget	0.3	8.9		
	2046	0.3	3.3	YES	YES

TABLE 16B (Cont'd)
Conformity Results for RTP Projects
2022 Conformity Results Summary – Merced

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
1997 Annual PM2.5 Standard	2023 Budget	0.3	5.3		
	2023	0.2	5.1	YES	YES
	2023 Budget	0.3	5.3		
	2029	0.2	4.1	YES	YES
	2023 Budget	0.3	5.3		
	2037	0.2	3.6	YES	YES
	2023 Budget	0.3	5.3		
	2046	0.2	3.6	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
2006 PM2.5 Winter 24-Hour Standard	2023 Budget	0.3	5.5		
	2023	0.2	5.3	YES	YES
	2024 Budget	0.3	5.3		
	2024	0.2	5.1	YES	YES
	2024 Budget	0.3	5.3		
	2031	0.2	4.1	YES	YES
	2024 Budget	0.3	5.3		
	2037	0.2	3.7	YES	YES
	2024 Budget	0.3	5.3		
	2046	0.2	3.8	YES	YES

Standard	Analysis Year	Emissions Total		DID YOU PASS?	
		PM2.5 (tons/day)	NOx (tons/day)	PM2.5	NOx
2012 Annual PM2.5 Standard (Moderate and Serious)	2022 Budget	0.3	7.6		
	2023	0.2	5.1	YES	YES
	2022 Budget	0.3	7.6		
	2025	0.2	4.7	YES	YES
	2022 Budget	0.3	7.6		
	2029	0.2	4.1	YES	YES
	2022 Budget	0.3	7.6		
	2037	0.2	3.6	YES	YES
	2022 Budget	0.3	7.6		
	2046	0.2	3.6	YES	YES

✓ **Particulate Matter**

For the 1997 annual and 24-hour and 2012 annual PM2.5 standards, the total regional on-road vehicle-related emissions associated with implementation of the 2023 FTIP Amendment No. 3 and the 2022 RTP Amendment No. 1 for the analysis years are either (1) projected to be less than the approved emission budgets, or (2) less than the emission budgets using the approved $PM_{2.5}$ and NOx trading mechanism for transportation conformity purposes from the *2008 $PM_{2.5}$ Plan (as revised in 2011)*. The conformity tests for $PM_{2.5}$ for the 1997 and 2012 standards are therefore satisfied.

- For the 2006 24-hour $PM_{2.5}$ standard, the total regional on-road vehicle-related emissions associated with implementation of the 2023 FTIP Amendment No. 3 and the 2022 RTP Amendment No. 1 for the analysis years are either (1) projected to be less than the approved emission budgets, or (2) less than the emission budgets using the approved $PM_{2.5}$ and NOx trading mechanism for transportation conformity purposes from the *2012 $PM_{2.5}$ Plan (as revised in 2015)*. The conformity tests for $PM_{2.5}$ for the 2006 standard are therefore satisfied.
- The 2023 FTIP Amendment No. 3 and the 2022 RTP Amendment No. 1 will not impede and will support timely implementation of the TCMs that have been adopted as part of applicable air quality implementation plans.

Based on the conformity analysis, the 2023 FTIP Amendment No. 3 and the 2022 RTP Amendment No. 1 conform to the applicable SIP and all applicable sections of the EPA's Transportation Conformity Rule.

The EPA is required by the CAA to set NAAQS for air pollutants to protect public health. The law also requires the EPA to establish air quality control regions and designate them as "attainment" for areas that comply with the NAAQS, and "nonattainment" for areas that do not. EPA's 2008 Ozone air quality standard SIP Requirements Rule established implementation requirements for the 2008 ozone NAAQS and revoked the 1997 ozone standard and established regulatory requirements flowing from that revocation. There are 27 areas that were designated nonattainment for the 2008 ozone NAAQS that were also nonattainment for the 1997 ozone NAAQS.

The United States Court of Appeals for the District of Columbia (D.C.) Circuit issued an opinion on February 16, 2018 invalidating major components of EPA's 2008 Ozone air quality standard. The D.C. Circuit ruled that the EPA unlawfully waived statutory attainment deadlines associated with the EPA's 1997 ozone NAAQS, which the agency revoked in the 2015 rule. At the time of preparation of this Draft EIR, guidance related to the D.C. Circuit court ruling had not been issued by EPA. As a result, Conformity for the 2022 RTP/SCS Amendment No. 1 does not reflect the 1997 ozone NAAQS. However, the conformity analysis will address EPA's response to the court ruling. It should be noted that significant impacts under the 1997 ozone NAAQS are not expected for the 2022 RTP/SCS Amendment No. 1 since the 2008 ozone requirements are more stringent. Please note that the Conformity Finding for the 2022 RTP/SCS Amendment No. 1, and any future modifications made by MCAG once guidance is available, are incorporated herein.

MCAG and the SJVAPCD continue to make reasonable further progress, using reasonably available control technology (RACT), best available control measures (BACM), and best available retrofit technology (BARCT). Since the SJVAPCD was designated nonattainment for the 1997 ozone standard at the time of revocation, they are subject to an array of anti-backsliding requirements. As a result, the SJVAPCD remains obligated to continue to implement the emissions controls as adopted in the 2007 Ozone Plan. The SJVAPCD has adopted numerous control measures that contribute to the Valley's progress towards clean air including:

- Rule 4103 Open Burning
- Rule 4601 Architectural Coatings
- Rule 4661 Organic Solvents
- Rule 9610 State Implementation Plan Credit for Emission Reductions Generated Through Incentive Programs

✓ **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 (5%) annual reduction in emissions documenting progress toward achievement of the State ambient air quality standards.

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 2022 RTP Amendment No. 1 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 (5%) 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 2022 RTP Amendment No. 1 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 2022 RTP Amendment No. 1 are less than specified motor vehicle emissions "budgets" contained in the applicable SJV SIPs. 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 16A (Amendment No. 1). These years are described as "budget years" because each SIP identifies motor vehicle emission "budgets" that motor vehicle emissions resulting from 2022 RTP/SCS Amendment No. 1 implementation cannot exceed in order to ensure continued progress toward attainment of the state standard. For on-road mobile sources, the SJVAPCD identifies the same emissions reduction strategies for both state and federal standards. Conformity demonstration with the federal standards satisfies state air quality requirements.

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 2022 RTP Amendment No. 1 are measured.

- Results of the Analysis

As shown in Tables 17A and B through 22A and B, 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 2022 RTP Amendment No. 1 contributes to positive progress toward the attainment of state ambient air quality standards. These tables also demonstrate that the 2022 RTP Amendment No. 1 is consistent with the SJVAPCD plans, including their regulations and incentives relative to motor vehicle emissions budgets.

Table 18A (PM10) documents that PM10 emissions grow in 2029, 2037 and 2046. It should be noted that PM10 emissions in 2029, 2037, and 2046 still remain below the motor vehicle emissions thresholds (i.e., "budget year" and "base year") compared to the 2022 RTP/SCS PEIR (Table 18B); therefore, the emissions comply with the SJVAPCD plan to reduce PM10 emissions. This demonstrates compliance with the state ambient air quality standards for PM10. Table 21A (NOx-Winter 24 Hr) documents that NOx emissions grow in 2046. It should be noted that NOx emissions in 2046 still remain below the motor vehicle emissions thresholds (i.e., "budget year" and "base year") compared to the 2022 RTP/SCS PEIR reflected in Table 21B; therefore, the emissions comply with the SJVAPCD plan to reduce NOx emissions. This demonstrates compliance with the state ambient air quality standards for NOx.

TABLE 17A
Ozone, ROG, and NOX Emissions Test (Summer Tons per Day) - 2023

	Emissions (Tons/Day)		% Below Budget	
	ROG	NOX	ROG	NOX
2023 Budget	**1.70**	**6.00**	**N/A**	**N/A**
2023	1.70	4.80	0.0%	20.0%
2026 Budget	**1.50**	**5.90**	**N/A**	**N/A**
2026	1.50	4.30	0.0%	27.1%
2029 Budget	**1.30**	**5.60**	**N/A**	**N/A**
2029	1.30	3.90	0.0%	30.4%
2031 Budget	**1.20**	**5.40**	**N/A**	**N/A**
2031	1.20	3.70	0.0%	31.5%
2037	0.90	3.40	25.0%	37.0%
2046	0.70	3.50	41.7%	35.2%

Source: MCAG, 2023

TABLE 17B
Ozone, ROG, and NOX Emissions Test (Summer Tons per Day) - 2022

	Emissions (Tons/Day)		% Below Budget	
	ROG	NOX	ROG	NOX
2023 Budget	**1.70**	**6.00**	**N/A**	**N/A**
2023	1.70	4.80	0.0%	20.0%
2026 Budget	**1.50**	**5.90**	**N/A**	**N/A**
2026	1.50	4.30	0.0%	27.1%
2029 Budget	**1.30**	**5.60**	**N/A**	**N/A**
2029	1.30	3.90	0.0%	30.4%
2031 Budget	**1.20**	**5.40**	**N/A**	**N/A**
2031	1.20	3.70	0.0%	31.5%
2037	0.90	3.40	25.0%	37.0%
2046	0.70	3.50	41.7%	35.2%

Source: MCAG, 2023

TABLE 18A
PM_{10} Emissions (Annual Tons per Day) - 2023

	Emissions (Tons/Day)		% Below Budget	
	PM10	NOX	PM10	NOX
Adjusted 2020 Budget	**4.30**	**8.20**	**N/A**	**N/A**
2022	4.30	5.10	0.0%	37.8%
Adjusted 2020 Budget	**4.40**	**8.00**	**N/A**	**N/A**
2029	4.40	4.10	0.0%	48.8%
Adjusted 2020 Budget	**4.60**	**7.70**	**N/A**	**N/A**
2037	4.60	3.50	0.0%	54.5%
Adjusted 2020 Budget	**4.70**	**7.60**	**N/A**	**N/A**
2046	4.70	3.60	0.0%	52.6%

Source: MCAG, 2023

TABLE 18B
PM_{10} Emissions (Annual Tons per Day) - 2022

	Emissions (Tons/Day)		% Below Budget	
	PM10	NOX	PM10	NOX
Adjusted 2020 Budget	**4.50**	**7.90**	**N/A**	**N/A**
2022	4.50	6.80	0.0%	13.9%
Adjusted 2020 Budget	**4.60**	**7.70**	**N/A**	**N/A**
2029	4.60	3.90	0.0%	49.4%
Adjusted 2020 Budget	**4.80**	**7.40**	**N/A**	**N/A**
2037	4.80	3.40	0.0%	54.1%
Adjusted 2020 Budget	**4.90**	**7.30**	**N/A**	**N/A**
2046	4.90	3.30	0.0%	54.8%

Source: MCAG, 2022

TABLE 19
$PM_{2.5}$ Emissions
1997 24-Hour (Tons per Day) - 2023

	Emissions (Tons/Day)		% Below Budget	
	PM2.5	NOX	PM2.5	NOX
2020 Budget	**0.30**	**8.90**	**N/A**	**N/A**
2023	0.20	5.10	33.3%	42.7%
2029	0.20	4.10	33.3%	53.9%
2037	0.20	3.60	33.3%	59.6%
2046	0.20	3.60	33.3%	59.6%

Source: MCAG, 2023

TABLE 20
$PM_{2.5}$ Emissions
1997 Annual Standards (Tons per Day) - 2023

	Emissions (Tons/Day)		% Below Budget	
	PM2.5	NOX	PM2.5	NOX
2023 Budget	**0.30**	**5.30**	**N/A**	**N/A**
2023	0.20	5.10	33.3%	3.8%
2029	0.20	4.10	33.3%	22.6%
2037	0.20	3.60	33.3%	32.1%
2046	0.20	3.60	33.3%	32.1%

Source: MCAG, 2023

TABLE 21
$PM_{2.5}$ Emissions
2006 Winter 24-Hour Standards (Tons per Day) - 2023

	Emissions (Tons/Day)		% Below Budget	
	PM2.5	NOX	PM2.5	NOX
2023 Budget	**0.30**	**5.50**	**N/A**	**N/A**
2023	0.20	5.30	33.3%	3.6%
2024 Budget	**0.30**	**5.30**	**N/A**	**N/A**
2024	0.20	5.10	33.3%	3.8%
2024 Budget	**0.30**	**5.30**	**N/A**	**N/A**
2031	0.20	4.10	33.3%	22.6%
2024 Budget	**0.30**	**5.30**	**N/A**	**N/A**
2037	0.20	3.70	33.3%	30.2%
2046	0.20	3.80	33.3%	28.3%

Source: MCAG, 2023

TABLE 22
$PM_{2.5}$ Emissions
2012 Annual Standards (Tons per Day) - 2023

	Emissions (Tons/Day)		% Below Budget	
	PM2.5	NOX	PM2.5	NOX
2022 Budget	**0.30**	**7.60**	**N/A**	**N/A**
2022	0.20	5.10	33.3%	32.9%
2025	0.20	4.70	33.3%	38.2%
2029	0.20	4.10	33.3%	46.1%
2037	0.20	3.60	33.3%	52.6%
2046	0.20	3.60	33.3%	52.6%

Source: MCAG, 2023

Emissions for criteria pollutants as a result of mobile sources from implementation of the 2022 RTP/SCS Amendment No. 1 were quantified for the Year 2019 and the Year 2046 with the Project. The emissions shown in Table 23A and 23B account for all mobile sources within Merced County. Results of the analysis in Table 23A (Amendment No. 1) show that emissions for criteria pollutants for the Year 2046 with the Project scenario will be less than the Year 2019 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 4% when compared to the Year 2019 Scenario. PM10 emission reductions were determined to be minimal when comparing the Year 2046 Build and No Build scenarios. It should also be noted that Project VMT projections in Table 23A do not account for "Off-model Reductions" as a result of the California High-Speed Rail (HSR), Altamont Corridor Express (ACE), and Amtrak San Joaquin (ASJ) rail systems. As documented in the *Inter-regional Rail Effect on Vehicle Miles Traveled in Merced County* memorandum prepared by Fehr & Peers (November 4, 2022), it found that inter-regional rail has the potential to reduce VMT generated in Merced County by 1,591,513 miles in 2025, and 1,192,279 miles in 2046.

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 ozone, PM2.5 and PM10 plans 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 2022 RTP Amendment No. 1 conforms to the applicable SIPs and demonstrates progress toward attainment with the state ambient air quality standards for PM10, PM2.5 and Ozone. As a result, implementation of the 2022 RTP Amendment No. 1 would result in a less than significant impact to PM10, PM2.5, and Ozone and would not impede the above referenced plans and regulations.

TABLE 23A
2022 RTP Amendment No. 1 Criteria Pollutant Emissions - 2023

	2019	2046 No Build	2046 Build (2022 RTP/SCS Scenario 3 - Amendment No. 1)
VMT	7,475,157	9,518,479	9,330,890
ROG (tons/day)	1.85	0.67	0.65
CO (tons/day)	13.21	4.90	4.80
NOX (tons/day)	8.80	3.36	3.29
PM10 (tons/day)	0.54	0.60	0.59
PM2.5 (tons/day)	0.25	0.24	0.24

Source: MCAG, EMFAC 2014.

TABLE 23B
2022 RTP Amendment No. 1 Criteria Pollutant Emissions - 2022

	2019	2046 No Build	2046 Build (2022 RTP/SCS Scenario 3)
VMT	7,475,157	9,518,479	9,332,225
ROG (tons/day)	1.85	0.67	0.65
CO (tons/day)	13.21	4.90	4.81
NOX (tons/day)	8.80	3.36	3.29
PM10 (tons/day)	0.54	0.60	0.59
PM2.5 (tons/day)	0.25	0.24	0.24

Source: MCAG, EMFAC 2014.

Mitigation Measures

✓ None required.

Significance After Mitigation

✓ Not applicable.

Impact AQ 2 – 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.

Merced County is nonattainment for Ozone (1 hour-State and 8 hour-Federal) and PM10 (State) and PM2.5 (Federal and State). 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 2016 and 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 2022 RTP Amendment No. 1 conforms to the applicable SJVAPCD plans (2016 and 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 2022 RTP Amendment No. 1 would result in a less than significant impact to PM10, PM2.5, and Ozone. While the 2022 RTP Amendment No. 1 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.

Impact AQ 3 – 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 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 (DPM), 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 4 on the following page.

- **Local MSAT Trends (Monitoring in Merced County)**

  Estimation of Risk: CARB monitors toxics throughout California, including sites near Merced County in the City of Fresno. Data obtained from two monitoring sites in the City of Fresno between 1989 and 2005 or 2020 is shown in Tables 24 through 33. *The Fresno monitoring site is the closest site to Merced County with available data for Ambient Toxic Summaries.* The site(s) in Merced County do not have this info. 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.

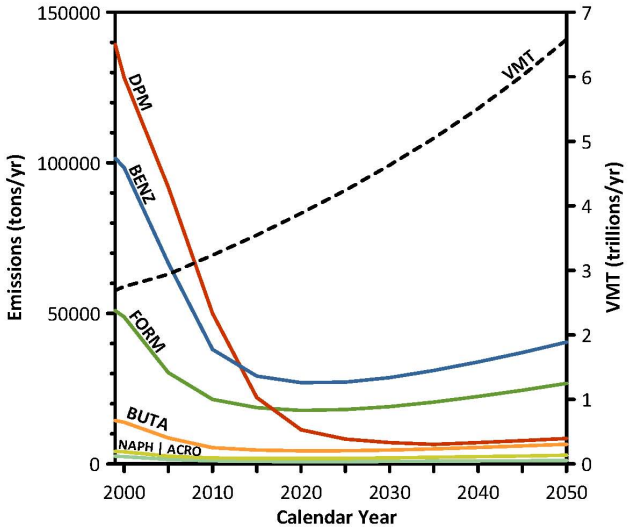
  Based on monitoring results in Tables 26 through 33, toxic emissions are declining except for formaldehyde. Results are the same for both Amendment No. 1 and for the 2022 RTP/SCS PEIR. To address this issue, a mitigation measure has been added to address project level impacts.

- ✓ **Diesel Particulate Matter (DPM) Emissions**

Vehicle DPM emissions were estimated using emission factors for particulate matter less than 10µm in diameter (PM10) generated with the 2021 version of the Emission Factor model (EMFAC) developed by CARB. EMFAC 2021 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 CARB to project changes in future emissions from on-road mobile sources. The most recent EPA approved version of this model, EMFAC 2021, incorporates regional motor vehicle data, information and estimates regarding the distribution of vehicle miles traveled (VMT) by speed, and number of starts per day.

FIGURE 4

**NATIONAL MSAT EMISSION TRENDS 1999 – 2050
FOR VEHICLES OPERATING ON ROADWAYS
USING EPA's MOBILE6.2 MODEL**



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

TABLE 24
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
2020[a]	0.02	*	*	*	0.08	0.024	7	0.04	*
2019[a]	0.02	0.02	0.040	0.11	0.13	0.037	29	0.04	43
2018[a]	0.02	0.02	0.050	0.10	0.20	0.047	30	0.04	55
2017[a]	0.02	0.02	0.055	0.10	0.22	0.052	30	0.04	59
2016[a]	0.02	0.02	0.060	0.18	0.27	0.070	31	0.04	65
2015[a]	0.02	0.02	0.057	0.13	0.26	0.061	30	0.04	62
2014[a]	0.02	0.02	0.064	0.20	0.28	0.076	30	0.04	69
2013[a]	0.02	0.02	0.092	0.20	0.37	0.093	31	0.04	100
2012[a]	0.02	0.02	0.047	0.14	0.18	0.049	29	0.04	51
2011	0.02	0.02	0.072	0.20	0.25	0.075	30	0.04	78
2010	0.02	0.02	0.059	0.16	0.21	0.060	30	0.04	64
2009	0.02	0.02	0.084	0.26	0.34	0.097	32	0.04	91
2008	0.02	0.04	0.071	0.16	0.27	0.069	31	0.04	77
2007	0.02	0.02	0.086	0.26	0.35	0.105	29	0.04	93
2006	0.02	0.05	0.082	0.21	0.30	0.085	31	0.04	88
2005	0.02	0.07	0.101	0.29	0.47	0.117	34	0.04	109
2004	0.02	0.02	0.098	0.26	0.39	0.106	30	0.04	106
2003	0.02	0.06	0.127	0.30	0.58	0.151	31	0.04	137
2002	0.02	0.07	0.194	0.47	1.00	0.225	31	0.04	209
2001	0.02	0.10	0.182	0.42	0.90	0.226	30	0.04	197
2000	0.02	0.09	0.195	0.62	1.00	0.285	30	0.04	211
1999	0.02	0.15	0.214	0.46	0.84	0.225	31	0.04	232
1998	0.02	0.15	0.265	0.78	1.00	0.295	31	0.04	287
1997	0.02	0.14	0.233	0.71	1.00	0.268	31	0.04	252
1996	0.02	0.13	0.234	0.49	1.00	0.230	31	0.04	253
1995	0.02	0.17	0.300	0.78	1.40	0.340	30	0.04	325
1994	0.02	0.22	0.356	0.79	1.80	0.380	31	0.04	384
1993	0.02	0.20	0.342	0.84	1.40	0.347	30	0.04	370
1992	0.02	0.16	0.262	0.61	0.93	0.268	30	0.04	283
1991	0.02	0.19	0.459	1.21	1.70	0.509	30	0.04	496
1990	0.02	0.14	*	1.04	1.60	0.466	24	0.04	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2023

[a] Fresno's Garland Monitoring Station

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

TABLE 25
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
2020[a]	0.10	*	*	*	0.4	0.099	7	0.05	*
2019[a]	0.05	0.12	0.193	0.50	0.6	0.169	29	0.05	50
2018[a]	0.06	0.18	0.266	0.53	1.5	0.285	31	0.05	69
2017[a]	0.05	0.21	0.313	0.68	1.2	0.273	30	0.05	81
2016[a]	0.03	0.17	0.279	0.64	0.9	0.238	31	0.05	73
2015[a]	0.05	0.18	0.257	0.50	0.9	0.231	30	0.05	67
2014[a]	0.03	0.16	0.270	0.59	0.9	0.237	30	0.05	70
2013[a]	0.05	0.21	0.329	0.63	1.0	0.263	31	0.05	86
2012[a]	0.08	0.20	0.260	0.53	0.8	0.184	29	0.05	68
2011	0.06	0.21	0.314	0.76	1.2	0.299	30	0.05	82
2010	0.05	0.23	0.260	0.58	0.7	0.195	30	0.05	68
2009	0.05	0.21	0.344	0.81	1.2	0.325	32	0.05	89
2008	0.09	0.24	0.356	0.72	1.0	0.265	31	0.05	93
2007	0.06	0.24	0.374	1.02	1.2	0.367	29	0.05	97
2006	0.05	0.27	0.387	1.00	1.4	0.342	31	0.05	101
2005	0.07	0.32	0.408	1.03	1.5	0.375	34	0.05	106
2004	0.07	0.22	0.403	0.78	1.4	0.350	30	0.05	105
2003	0.10	0.31	0.546	1.20	1.8	0.498	31	0.05	142
2002	0.08	0.27	0.631	1.50	2.2	0.574	31	0.05	164
2001	0.08	0.40	0.610	1.26	3.1	0.672	30	0.05	159
2000	0.10	0.50	0.730	1.90	3.1	0.860	30	0.20	191
1999	0.10	0.50	0.800	1.70	2.9	0.730	31	0.20	207
1998	0.10	0.50	0.830	2.30	2.8	0.830	31	0.20	215
1997	0.10	0.50	1.000	2.40	5.8	1.190	31	0.20	259
1996	0.25	0.25	0.790	1.50	3.1	0.700	33	0.50	206
1995	0.25	1.00	1.240	2.40	4.5	1.110	30	0.50	322
1994	0.25	1.00	1.440	3.10	7.6	1.550	31	0.50	375
1993	0.25	1.20	1.350	3.60	4.4	1.260	30	0.50	352
1992	0.25	1.00	1.340	2.80	3.8	1.050	30	0.50	347
1991	0.25	1.60	2.420	5.40	7.3	2.040	30	0.50	629
1990	0.25	1.30	*	5.20	5.4	1.780	24	0.50	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2023

[a] Fresno's Garland Monitoring Station

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

TABLE 26
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
2020[a]	0.50	*	*	*	3.8	1.13	7	0.1	*
2019[a]	0.80	2.5	2.95	5.7	6.5	1.88	30	0.1	62
2018[a]	0.80	3.0	3.72	6.2	9.6	2.26	32	0.1	78
2017[a]	0.70	3.4	4.06	6.9	8.0	2.12	29	0.1	85
2016[a]	1.20	2.9	3.58	5.9	7.4	1.69	33	0.1	75
2015[a]	1.40	3.6	3.68	6.3	7.9	1.86	29	0.1	77
2014[a]	0.70	3.9	3.65	5.8	7.7	1.79	30	0.1	77
2013[a]	0.80	3.6	3.80	6.0	7.9	1.80	34	0.1	80
2012[a]	0.70	2.9	3.34	6.4	9.2	2.30	30	0.1	70
2011	0.60	2.7	3.34	5.8	11.0	2.26	31	0.1	70
2010	0.30	2.5	3.01	5.7	9.7	2.23	29	0.1	63
2009	0.05	1.8	2.56	5.2	7.5	1.89	31	0.1	54
2008	0.70	2.9	3.13	5.1	6.8	1.65	30	0.1	66
2007	0.60	2.8	2.88	4.8	7.9	1.53	30	0.1	61
2006	0.60	3.2	3.41	5.5	8.8	1.90	31	0.1	72
2005	0.70	2.5	3.00	6.0	6.9	1.88	33	0.1	63
2004	1.00	2.2	2.57	3.9	5.0	1.15	31	0.1	54
2003	0.70	3.9	3.72	6.0	8.0	1.94	33	0.1	78
2002	1.10	3.5	4.16	5.6	18.0	3.20	32	0.1	87
2001	1.20	3.3	4.32	5.4	26.0	4.43	30	0.1	91
2000	0.90	2.6	3.56	6.4	7.9	1.92	28	0.1	75
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	72
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	51
1994	0.20	1.8	2.01	4.0	7.4	1.61	31	0.1	42
1993	0.60	1.3	1.64	3.4	4.5	1.16	26	0.1	35
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	49
1990	0.05	1.3	*	5.4	9.0	2.32	23	0.1	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2023

[a] Fresno's Garland Monitoring Station

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

TABLE 27
City of Fresno – First Street Monitoring Site
(Acrolein Measurements)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit
2020[a]	0.15	*	*	*	0.4	0.14	5	0.3
2019[a]	0.15	0.4	0.44	0.9	1.8	0.38	29	0.3
2018[a]	0.15	0.4	0.31	0.4	0.6	0.13	31	0.3
2017[a]	0.15	0.2	0.30	0.4	1.0	0.19	30	0.3
2016[a]	0.15	0.4	*	0.5	0.6	0.15	27	0.3
2015[a]	0.15	0.3	0.40	0.9	1.3	0.33	29	0.3
2014[a]	0.15	0.6	0.81	2.0	3.1	0.71	29	0.3
2013[a]	0.15	0.7	0.84	1.2	3.3	0.63	28	0.3
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, 2023

[a] Fresno's Garland Monitoring Station

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

TABLE 28
City of Fresno – First Street Monitoring Site
(Benzo(a)pyrene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.130	*	*	*	0.63	0.198	5	0.05	*
2004	0.025	0.025	0.210	0.63	2.00	0.415	30	0.05	0.70
2003	0.025	0.025	0.414	1.20	2.90	0.795	31	0.05	1.00
2002	0.025	0.025	0.466	1.52	2.70	0.729	30	0.05	1.00
2001	0.025	0.110	0.501	1.00	4.30	1.100	31	0.05	2.00
2000	0.025	0.025	0.491	1.15	4.60	1.080	30	0.05	2.00
1999	0.025	0.025	0.533	2.02	4.10	1.100	30	0.05	2.00
1998	0.025	0.060	0.618	2.40	4.30	1.180	31	0.05	2.00
1997	0.025	0.060	0.562	1.59	4.60	1.040	30	0.05	2.00
1996	0.025	0.025	0.515	2.60	3.00	1.020	24	0.05	2.00
1995	0.025	0.100	0.533	1.21	3.60	0.964	24	0.05	2.00
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	4.00
1992	0.025	0.080	0.624	2.19	4.70	1.180	24	0.05	2.00
1991	0.025	0.180	0.885	3.81	4.80	1.530	24	0.05	3.00
1990	0.025	0.070	*	1.52	23.00	5.380	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2023
* Means there was insufficient or no data available to determine the value

TABLE 29
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, 2023
* Means there was insufficient or no data available to determine the value

TABLE 30
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, 2023

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

TABLE 31
City of Fresno – First Street Monitoring Site
(Benzo(k)fluoranthene-10)

Year	Minimum	Median	Mean	90th Percentile	Max.	Stan Dev.	Number of Observations	Detection Limit	Estimated Risk
2005	0.100	*	*	*	0.26	0.065	5	0.05	*
2004	0.025	0.025	0.117	0.34	1.00	0.202	30	0.05	0.04
2003	0.025	0.025	0.209	0.50	1.50	0.354	31	0.05	0.07
2002	0.025	0.025	0.227	0.64	1.30	0.333	30	0.05	0.07
2001	0.025	0.060	0.249	0.49	2.10	0.495	31	0.05	0.08
2000	0.025	0.025	0.234	0.54	1.90	0.485	30	0.05	0.07
1999	0.025	0.025	0.250	0.95	1.80	0.481	30	0.05	0.08
1998	0.025	0.025	0.266	1.10	1.60	0.452	31	0.05	0.08
1997	0.025	0.025	0.270	0.69	2.20	0.482	30	0.05	0.09
1996	0.025	0.025	0.210	0.88	1.20	0.380	24	0.05	0.07
1995	0.025	0.060	0.251	0.52	1.50	0.402	24	0.05	0.08
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	0.20
1992	0.025	0.050	0.313	1.10	2.30	0.570	24	0.05	0.10
1991	0.025	0.100	0.395	1.42	2.30	0.658	24	0.05	0.10
1990	0.025	0.025	*	0.83	9.60	2.240	18	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2023
* Means there was insufficient or no data available to determine the value

TABLE 32
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, 2023
* Means there was insufficient or no data available to determine the value

TABLE 33
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	0.09
2003	0.025	0.060	0.430	1.20	2.60	0.665	31	0.05	0.10
2002	0.025	0.025	0.515	1.31	2.80	0.766	30	0.05	0.20
2001	0.025	0.210	0.625	1.50	4.90	1.180	31	0.05	0.20
2000	0.025	0.090	0.585	1.56	4.30	1.120	30	0.05	0.20
1999	0.025	0.110	0.619	2.50	4.10	1.120	30	0.05	0.20
1998	0.025	0.160	0.698	2.70	4.00	1.090	31	0.05	0.20
1997	0.025	0.110	0.697	1.78	6.20	1.270	30	0.05	0.20
1996	0.025	0.100	0.509	2.14	2.90	0.871	24	0.05	0.20
1995	0.025	0.180	0.618	1.47	3.10	0.857	24	0.05	0.20
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	0.40
1992	0.025	0.160	0.809	2.78	5.60	1.370	24	0.05	0.30
1991	0.050	0.400	1.100	3.53	4.80	1.500	24	0.05	0.40
1990	0.025	*	*	*	26.00	8.830	8	0.05	*
1989	*	*	*	*	*	*	0	*	*

Source: California Air Resources Board, 2023
* Means there was insufficient or no data available to determine the value

Several distinct emission processes are included in EMFAC 2021. Emission factors calculated using EMFAC 2021 are expressed in units of grams per vehicle miles traveled (g/VMT) or grams per idle-hour (g/idle-hr), 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 2021 in EMFAC Mode for vehicles in Merced 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 99 and SR 152 within the City of Merced and City of Los Banos, respectively. The vehicle travel speeds for each segment were estimated to be 55 miles per hour.

PM10 emissions were calculated at 50,000, 100,000, and 150,000 ADT for all three segments discussed above. The highest truck percentage along each respective route was applied to the Average Daily Traffic (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 99 and SR 152 are 27% and 17%, respectively.

Tables 34A and B through 39A and B show the estimated emissions for the diesel operated vehicles that travel along SR 99 and SR 152, which are the highest volume roadways within the County. 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. *EMFAC 2017 was used in the previous version of the RTP for purposes of estimating mobile source emissions from diesel trucks.*

TABLE 34A
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 99 – 50,000 ADT - 2023

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	13,500	4,927,500	0.5	0.015	3.320E-05	327.2	0.224	0.0350
							Total PM_{10} Emissions	**327.2**	**0.2241**	**0.0350**

References:
(1) Emission Factors source: EMFAC2021 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 34B
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 99 – 50,000 ADT - 2022

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	13,500	4,927,500	0.5	0.018	3.888E-05	383.2	0.262	0.0409
							Total PM_{10} Emissions	**383.2**	**0.2625**	**0.0409**

References:
(1) Emission Factors source: EMFAC2017 for Merced County Year 2046, for speed distribution of 55 mph
Assumptions:

TABLE 35A
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 99 – 100,000 ADT - 2023

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	27,000	9,855,000	0.5	0.015	3.320E-05	654.4	0.448	0.0699
							Total PM_{10} Emissions	**654.4**	**0.4482**	**0.0699**

References:
(1) Emission Factors source: EMFAC2021 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 35B
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 99 – 100,000 ADT - 2022

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	27,000	9,855,000	0.5	0.018	3.888E-05	766.4	0.525	0.0819
							Total PM_{10} Emissions	**766.4**	**0.5249**	**0.0819**

TABLE 36A
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 99 – 150,000 ADT - 2023

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	40,500	14,782,500	0.5	0.015	3.320E-05	981.6	0.672	0.1049
							Total PM_{10} Emissions	**981.6**	**0.6723**	**0.1049**

References:
(1) Emission Factors source: EMFAC2021 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 36B
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 99 – 150,000 ADT - 2022

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	40,500	14,782,500	0.5	0.018	3.888E-05	1,149.6	0.787	0.1228
							Total PM_{10} Emissions	**1,149.6**	**0.7874**	**0.1228**

References:
(1) Emission Factors source: EMFAC2017 for Merced County Year 2046, for speed distribution of 55 mph
Assumptions:

TABLE 37A
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 152 – 50,000 ADT - 2023

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	7,500	2,737,500	0.5	0.015	3.320E-05	181.8	0.125	0.0194
							Total PM_{10} Emissions	**181.8**	**0.1245**	**0.0194**

References:
(1) Emission Factors source: EMFAC2021 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 37B
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 152 – 50,000 ADT - 2022

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	7,500	2,737,500	0.5	0.018	3.888E-05	212.9	0.146	0.0227
							Total PM_{10} Emissions	**212.9**	**0.1458**	**0.0227**

References:
(1) Emission Factors source: EMFAC2017 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 38A
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 152 – 100,000 ADT - 2023

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	15,000	5,475,000	0.5	0.015	3.320E-05	363.5	0.249	0.0388
							Total PM_{10} Emissions	**363.5**	**0.2490**	**0.0388**

References:
(1) Emission Factors source: EMFAC2021 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 38B
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 152 – 100,000 ADT - 2022

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	15,000	5,475,000	0.5	0.018	3.888E-05	425.8	0.292	0.0455
							Total PM_{10} Emissions	**425.8**	**0.2916**	**0.0455**

TABLE 39A
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 152 – 150,000 ADT - 2023

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	22,500	8,212,500	0.5	0.015	3.320E-05	545.3	0.374	0.0583
							Total PM_{10} Emissions	**545.3**	**0.3735**	**0.0583**

References:
(1) Emission Factors source: EMFAC2021 for Merced County Year 2046, for speed distribution of 55 mph

TABLE 39B
2046 Build (2022 RTP/SCS Amendment No. 1) Mobile Source Emissions
SR 152 – 150,000 ADT – 2022

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	22,500	8,212,500	0.5	0.018	3.888E-05	638.7	0.437	0.0682
							Total PM_{10} Emissions	**638.7**	**0.4374**	**0.0682**

References:
(1) Emission Factors source: EMFAC2017 for Merced County Year 2046, 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. Receptors of primary interest for this analysis are those that generate the highest risk as it relates to diesel truck traffic along SR 99 and SR 152, since these corridors are adjacent to densely populated areas in Merced County. A 10-year research program (California Air Resources Board 1998) demonstrated that DPM from diesel-fueled engines is a human carcinogen and that chronic (long-term) inhalation exposure to DPM 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.

The meteorological data that was used in the analysis comes from the Merced station and is published by the District. The data from the Merced station, which is located near the Merced Regional Airport, includes four years of data from 2012 through 2016. The data from the Merced 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:

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

Where:
Slope Factor = 1.1
DBR = 393
A = 1
EF = 350 d/y
ED = 70 yr
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 40. The results are the same for Amendment No. 1 and for the 2022 RTP/SCS PEIR. As shown, the cancer risk values are above the significance threshold of 10 in one million for each segment with 50,000 ADT or more assuming that the highest truck percentage applies to the entire corridor. So, for corridors with segments greater than 25,000 ADT and 10% truck traffic, the cancer risk may be present. For SR 99, which has the highest truck volumes and ADT in the County, the cancer risk may be present for corridor segments with even less than 50,000 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 25,000 ADT are potentially at risk, as well as those segments with high truck volumes that may have less than a 25,000 ADT.

TABLE 40
Maximum Human Health Risk Assessment Results

Scenario	Maximum Cancer Risk (in one million)	
	SR 99	SR 152
50,000 ADT	**27.3**	**19.8**
100,000 ADT	**57.1**	**42.2**
150,000 ADT	**86.8**	**59.6**

Bold denotes exceedance of significance threshold
Source: VRPA Technologies, 2023

Diesel Particulate emissions were quantified for the Merced County portions of SR 99 to determine the impacts of diesel particulate matter (PM10 and PM2.5) on the residents of Merced County. Future projected emissions were compared to existing baseline emissions to determine if diesel particulate emissions increase over time as a result of the 2022 RTP Amendment No. 1.

The highest average daily trip (ADT) volumes from Caltrans' 2019 counts and the ADT projections for the year 2046 for the SR 99 corridor was used to determine the daily VMT for the SR 99 corridor within Merced County for the year 2019 and 2046. To develop a "worst case" emissions estimate, the highest percentage of truck traffic along SR 99, which was determined from Caltrans' 2020 counts, was then multiplied by the ADT volumes for the year 2019 and 2046. This yielded the average daily truck trips for the SR 99 corridor. The average daily truck trips for the year 2019 and 2046 were then multiplied by the total length of the corridor within Merced County (37 miles for SR 99). The resultant was the estimated daily VMT for trucks along the SR 99 corridor. This approach is deemed conservative, as all other SR 99 segments have truck volumes less than or equal to the highest segment. This approach assumes the highest truck volumes occur across all segments of SR 99 in Merced County.

As all trucks are not diesel and do not emit diesel particulate, EMFAC2021 was utilized to determine the percentage of trucks that were diesel. EMFAC2021 emissions rates were then utilized to quantify diesel particulate running exhaust emissions on the SR 99 corridor for the 2019 base year and the 2046 project. Table 41 shows the results of the analysis.

Referencing Table 41, results of the analysis show that PM10 emissions for the Project (2022 RTP/SCS - Scenario 3 Amendment No. 1) are anticipated to be less than the PM10 emissions for the 2019 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 41
Running Emissions Summary

SR 99 Diesel Emissions (tons/day)		
	2019	2046
Diesel PM10	0.0757	0.0203
Diesel PM2.5	0.0724	0.0194
VMT per day	820,179	1,399,932

Source: VRPA, 2023

Mitigation Measures

The specific impacts on air quality will be evaluated as part of the implementing 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 MCAG does not have land use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below.

- ✓ **AQ 1** As air toxics research continues, implementing agencies should 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 should 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.

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 health risk 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, MCAG will encourage the implementation of the above-notated mitigation strategy intended to avoid or reduce the significant impacts identified.

Impact AQ 4 – Result in other emissions (such as those leading to odors) adversely 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 Measures

- ✓ **AQ 1** As air toxics research continues, implementing agencies should 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 should 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.

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 health risk 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, MCAG will encourage the implementation of the above-notated mitigation strategy intended to avoid or reduce the significant impacts identified.

Findings

Comparing the results of the tables above (Tables A vs B) reflective of the proposed Amendment No. 1 compared to the analysis contained in the 2022 RTP/SCS PEIR, changes are minimal and insignificant. As such, the analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No. 1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant air quality impacts or a substantial increase in the severity of air quality impacts beyond those programmatically addressed in the 2022 RTP/SCS PEIR. It should further be noted that detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project.

7.4 Biological Resources

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to biological resources beyond those already identified in the 2022 RTP/ SCS PEIR. The 2022 RTP/SCS PEIR concluded that significant impacts expected with the implementation of the RTP/SCS includes the disturbance and removal of natural vegetation that may be utilized by sensitive species, habitat fragmentation and associated decrease in habitat quality, litter, trampling, light pollution and road noise, displacement of riparian and wetland habitat, siltation, loss of prime farmlands, grazing lands, open space and recreation lands (reference the 2022 RTP/SCS PEIR, pages 3-123 through 3-159).

Detailed project-level analysis, including project level mitigation measures, will be conducted by each implementing agency for each individual project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/ SCS Amendment No.1) at the program level. Thus, the incorporation of the proposed changes to the Project List would not result in any new significant impacts to biological resources, or a substantial increase in the severity of impacts to biological resources beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.5 Climate Change

As shown in the following section, the proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No. 1 are not expected to cause any new or a substantial increase in the severity of significant impacts to greenhouse gas emissions and climate change beyond those already identified in the 2022 RTP/SCS PEIR.

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/SCS impacts. The 2022 RTP/SCS PEIR section related to Climate Change can be found on Pages 3-160 through 3-194 of the Draft PEIR.

The section has been revised to reflect the latest impact results reflective of the 2022 RTP/SCS and Amendment No.1. As noted previously, where table results with Amendment No. 1 have changed, the original table from the certified 2022 RTP/SCS PEIR is also provided below it to compare results. In almost all cases, changes are insignificant, or impacts are reduced with Amendment No. 1. As a result of these analyses, changes reflected in the 2022 RTP/SCS Amendment No.1 will not cause additional significant environmental effects referenced in the 2022 RTP/SCS PEIR.

Regulatory Setting

Federal

In 1988, the United Nations established the Intergovernmental Panel on Climate Change (IPCC) 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 greenhouse gases (GHGs) fall within the Clean Air Act's definition of an "air pollutant" and directed the U. S. Environmental Protection Agency (EPA) to deem whether GHGs are affecting climate change. The EPA must regulate GHG emissions from automobiles under the Federal Clean Air Act (FCAA) if it is determined GHGs do affect climate change. 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 United State Environmental Protection Agency (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*.

Federal Regulations

- ✓ **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 miles per gallon (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, U.S. 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 U.S. 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 carbon dioxide (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 alternative fueled vehicles (AFVs). States are also required by the act to consider a variety of incentive programs to help promote AFVs.

- ✓ **Moving Ahead for Progress in the 21st Century (MAP-21)** - The bill alters the requirements and incentives for spending on sustainable transportation initiatives. More specifically, the bill demands MPOs to address performance measures in planning and project selection. Long-range plans are required to include performance targets, and transportation improvement programs must discuss the anticipated effects of selected projects toward achieving the performance targets. In addition, electric vehicle charging and natural gas fueling stations are expressly authorized uses of funding under Congestion Mitigation and Air Quality Program (CMAQ), surface transportation, and highway safety programs. The bill is the first significant change to transportation funding since the passage of Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005.

- ✓ **Fixing America's Surface Transportation (FAST) Act** - On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) into law—the first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains our focus on safety, keeps intact the established structure of the various highway-related programs we manage, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. With the enactment of the FAST Act, states and local governments are now moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

- ✓ **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.

- ✓ **Energy Independence and Security Act of 2007** - Passed in 2007, the Energy Independence and Security Act of 2007 (EISA) (42 USC Section 17381 [2007]) includes provisions to increase the supply of renewable alternative fuel sources by setting a mandatory Renewable Fuel Standard. The standard mandates transportation fuel sold in the U.S. to contain a minimum of 36 billion gallons of renewable fuels annually by 2022. EISA also promotes grant programs to encourage the development of cellulosic biofuels, plug-in hybrid electric vehicles, and other emerging electric vehicle technologies. EISA codifies into law the energy reduction goals for federal agencies put

forth in Executive Order 13423 (U.S. EPA 2007), and creates new requirements related to Corporate Average Fuel Economy Standards, the Renewable Fuel Standard, and efficiency standards for lighting and appliances.

- ✓ **Executive Order 13514** - The President signed Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (3 CFR 13514), in October 2009. This Executive Order concentrates on improving the environmental, energy, and economic performance of federal agencies. Federal agencies are required to increase energy efficiency, reduce fleet petroleum consumption, conserve water, reduce waste, support sustainable communities, and leverage federal purchasing power to promote environmentally responsible products and technologies.

  The Executive Order requires agencies to meet energy, water, and waste reduction targets, including:

  - 30 percent reduction in vehicle fleet petroleum use by 2020.
  - 26 percent improvement in water efficiency by 2020.
  - 50 percent recycling and waste diversion by 2015.
  - 95 percent of all applicable contracts will meet sustainability requirements.
  - Implementation of the 2030 net-zero-energy building requirement.

- ✓ **Federal Climate Change Policy** - According to the U.S. 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 U.S. 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 U.S. EPA Administrator signed two distinct findings regarding greenhouse gases under section 202(a) of the Federal Clean Air Act (FCAA):

  - **Endangerment Finding:** The U.S. EPA Administrator found that the current and projected concentrations of the six key well-mixed greenhouse gases--carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6)--in the atmosphere threaten the public health and welfare of current and future generations.
  - **Cause or Contribute Finding:** The U.S. 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 U.S. EPA's proposed greenhouse gas emission standards for light-duty vehicles. On May 7, 2010, the U.S. 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 FCAA, 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.

- ✓ **Executive Order 13693** - President Obama signed Executive Order 13693, Planning for Federal Sustainability in the Next Decade, in March 2015. This Executive Order focuses on reducing GHG emissions from Federal agencies by 40 percent over the next 10-year period. Federal agencies are required to propose percentage reduction targets for GHG emissions by fiscal year end in 2025.

  Various statewide and local initiatives to reduce California's contribution to GHG emissions (referenced below) 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.

State Agencies

- ✓ **California Air Resources Board (CARB)** - 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. CARB was created in 1967 from the merging of the California Motor Vehicle Pollution Control Board and the Bureau of Air Sanitation and its Laboratory.

  CARB has primary responsibility in California to develop and implement air pollution control plans designed to achieve and maintain the NAAQS established by the EPA. Whereas CARB 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. CARB 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 CARB, and attainment plans adopted by the Air Pollution Control Districts (APCDs) and Air Quality Management District's (AQMDs) and approved by CARB.

State Regulations

- ✓ **California Strategy to Reduce Petroleum Dependence - Assembly Bill (AB 2076)** - The strategy, *Reducing California's Petroleum Dependence*, was adopted by the California Energy Commission (CEC) and the California Air Resources Board (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 the 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.

- ✓ **AB 1493 (Pavley)** - AB 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 [Association of Environmental Professionals (AEP) 2007)]. In 2005, the CARB requested a waiver from U.S. EPA to enforce the regulation, as required under the CAA. 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 CAA preemption to California for its greenhouse gas emission standards for motor vehicles beginning with the 2009 model year.

- ✓ **Energy: Planning and Forecasting, Senate Bill 1389 (SB 1389)** - Passed in 2002, SB 1389 requires the CEC to adopt and present to the Governor and Legislature a report of findings every two years. The Integrated Energy Policy Report make recommendations to increase California's energy supplies, reduce energy demand, broaden the range of alternatives to conventional energy sources, and improve the State's energy delivery infrastructure.

  In the 2006 Integrated Energy Policy Report Update, the CEC states that California's population is expected to grow by 20 million people between 2000 and 2050 and that this growth will strain California's energy and infrastructure system. The report was updated in 2008, 2010, 2012, 2014 and again in 2016. The 2016 update focused on a variety of energy issues, including:

  - ➢ The role of transportation in meeting state climate, air quality, and energy goals.
  - ➢ Report status of statewide plug-in electric vehicle infrastructure.
  - ➢ Obstacles and opportunities for electric vehicle infrastructure deployment.
  - ➢ Marketing effort of Alternative and Renewable Fuel and Vehicle Technology Program investments.
  - ➢ Connection with natural gas infrastructure and evaluation of methane emissions.
  - ➢ The integration of environmental information in renewable energy planning processes.

- ✓ **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.

- ✓ **AB 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 was

required to adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020.

On December 11, 2008, CARB adopted its initial 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's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan. The current plan has identified new policies and actions to accomplish the State's 2030 GHG limit.

- ✓ **California Global Warming Solutions Act of 2006: emissions limit, or SB 32** – SB 32 is a California Senate bill expanding upon AB 32 to reduce greenhouse gas (GHG) emissions. The lead author is Senator Fran Pavley and the principal co-author is Assembly member Eduardo Garcia. SB 32 was signed into law on September 8, 2016, by Governor Edmund Gerald "Jerry" Brown Jr. SB 32 sets into law the mandated reduction target in GHG emissions as written into Executive Order B-30-15. SB 32 requires that there be a reduction in GHG emissions to 40% below the 1990 levels by 2030. Greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The California Air Resources Board (CARB) is responsible for ensuring that California meets this goal. The provisions of SB 32 were added to Section 38566 of the Health and Safety Code subsequent to the bill's approval. The bill went into effect January 1, 2017. SB 32 builds onto Assembly Bill (AB) 32 written by Senator Fran Pavley and Assembly Speaker Fabian Nunez passed into law on September 27, 2006. AB 32 required California to reduce greenhouse gas emissions to 1990 levels by 2020 and SB 32 continues that timeline to reach the targets set in Executive Order B-30-15. SB 32 provides another intermediate target between the 2020 and 2050 targets set in Executive Order S-3-05.

- ✓ **AB 1007** - AB 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 CO2 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)."

- ✓ **SB 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, the Office of Planning and Research (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 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.

- ✓ **SB 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 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. 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 Renewable Portfolios Standard (RPS), SB 1078** - SB 1078 (Stats. 2002, Ch. 516) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide 20 percent of their supply from renewable sources by 2017 but later moved forward by SB 1078 to require compliance by 2010. In addition, providers subject to the RPS must increase their renewable share by at least one percent each year. In 2011, Governor Brown signed the California Renewable Energy Resources Act of 2011, also known as Senate Bill 2 (Stats. 2011, 1st Ex. Sess., Ch. 1; SB X1-2) that applies renewable energy standards to all energy providers and requires a 33 percent renewable mix by 2020.

- ✓ **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** - In accordance with AB 32, CARB developed the 2008 Scoping Plan to outline the State's strategy to achieve 1990 level emissions by year 2020. To estimate the reductions necessary, CARB projected statewide 2020 BAU GHG emissions (i.e., GHG emissions in the absence of statewide emission reduction measures). CARB identified that the State as a whole would be required to reduce GHG emissions by 28.5 percent from year 2020 BAU to achieve the targets of AB 32. The GHG emissions forecast was updated as part of the First Update to the Scoping Plan. In the First Update to the Scoping Plan, CARB projected that statewide BAU emissions in 2020 would be approximately 509 million MTCO2e. Therefore, to achieve the AB 32 target of 431 million MTCO2e (i.e., 1990 emissions levels) by 2020, the State would need to reduce emissions by 78 million MTCO2e compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020. Several statewide strategies to reduce GHG emission are identified in the 2008 Scoping Plan and would ensure the State is on target to achieve the GHG emissions reduction goals of AB 32.

Statewide GHG emissions reduction measures that are being implemented would apply to future development and vehicle travel allowed under the updated Comp Plan and would therefore reduce the Region's future GHG emissions. As described in the 2014 First Update to the Scoping Plan, as California continues to build its climate policy framework, there is a need for local government climate action planning to adopt mid-term and long-term reduction targets that are consistent with scientific assessments and the statewide goal of reducing emissions 80 percent below 1990 levels by 2050.

CARB identifies that local government reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals. CARB has completed the 2030 Target Scoping Plan Update to address the new interim GHG reduction target for 2030 under SB 32 of 40 percent below 1990 levels (November 2017). The California Air Resources Board (CARB) is responsible for ensuring that California meets this goal. The bill went into effect January 1, 2017.

The 2030 Target Scoping Plan update focuses on statewide strategies to achieve the GHG reductions for year 2030 required under SB 32, which are a 40 percent reduction from 1990 levels. There is no legislative target or plans being prepared to address the GHG reductions needed to achieve the long-term GHG goal for 2050 identified in Executive Order S-03-05 because it is not a State legislative target. Consequently, consistency with statewide GHG reduction strategies focuses on consistency with plans adopted to achieve the legislative target for year 2020 established under AB 32 and outlined in the Scoping Plan.

- ✓ **2013 Zero Emission Vehicle Action Plan** - Governor Brown issued Executive Order B-16-2012 in 2012, which calls for the rapid commercialization of zero emission vehicles (ZEV). The goal of this Executive Order is to have 1.5 million ZEVs on California's roads by 2025. The order targets the transportation sector and calls for a reduction of GHG emissions to 80 percent below 1990 levels by 2020.

- ✓ **Senate Bill 743 (SB 743)** - On September 27, 2013, Governor Brown signed Senate Bill 743 (Steinberg, 2013). Among other things, SB 743 creates a process to change analysis of transportation impacts under CEQA. Currently, environmental review of transportation impacts focuses on the delay that vehicles experience at intersections and on roadway segments. That delay is measured using a metric known as "level of service," or LOS. Mitigation for increased delay often involves increasing capacity (i.e., the width of a roadway or size of an intersection), which may increase auto use and emissions and discourage alternative forms of transportation. Under SB 743, the focus of transportation analysis will shift from driver delay to reduction of greenhouse gas emissions, creation of multimodal networks and promotion of a mix of land uses.

  Specifically, SB 743 requires the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines (Title 14 of the California Code of Regulations sections and following) to provide an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses". Measurements of transportation impacts may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated". OPR also has discretion to develop alternative criteria for areas that are not served by transit, if appropriate.

  At the time of preparation of this Draft EIR, SB 743 has not yet been adopted into CEQA. In November 2017, OPR developed final guidelines for the implementation of SB 743 and sent them to the Natural Resources Agency for adoption. A formal adoption process is currently underway.

OPR's guidelines recommend a target date of January 1, 2020 for statewide implementation of SB 743.

- ✓ **Senate Bill 350 (SB 350)** - SB 350, adopted in 2015, supports GHG emissions from the electric sector through various measures. These measures include a doubling statewide energy efficiency savings in electricity and natural gas by retail customers by 2030 and requiring a fifty percent renewables portfolio standard for electricity providers by the year 2030.

- ✓ **Executive Order B-30-15** - Executive Order B-30-15, which was signed by Governor Brown in 2016, establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPO's to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.

- ✓ **Senate Bill 1383 (SB 1383)** – SB 1383, adopted in 2016, requires approval and implementation of a comprehensive strategy to reduce emissions of short-lived climate pollutants by CARB. SB 1383 mandates the strategy set the following targets for the year 2030:

  - Methane – 40% below 2013 levels
  - Hydrofluorocarbons – 40% below 2013 levels
  - Anthropogenic black carbon – 50% below 2013 levels

  SB 1383 also mandates that CalRecycle adopt regulations geared toward achieving the specified targets for the reduction of organic waste in landfills.

- ✓ **SB 1: Transportation Funding** - SB 1, the Road Repair and Accountability Act of 2017, was signed into law on April 28, 2017. This legislative package invests $54 billion over the next decade to fix roads, freeways and bridges in communities across California and puts more dollars toward transit and safety. These funds will be split equally between state and local investments. Implementation: SB 1's investment in transportation is split equally between the state and cities and counties. The cities and counties will receive $26 billion, and the state highway system will also receive $26 billion. Investing to Meet Needs: SB 1 provides support for state and local systems to meet four critical needs, those needs are: Congestion Relief, Trade Corridor Improvements, Improved Transit/Rail Travel, and Pedestrian/Cyclist Safety Projects. Transportation Future: By 2027, Caltrans will repair or replace 17,000 miles of pavement, 55,000 culverts or drains 7,700 signals, signs and sensors, and 500 bridges.

<u>Regional</u>

- ✓ **San Joaquin Valley Air Pollution Control District** - To assist Lead Agencies, project proponents, permit applicants, and interested parties in assessing and reducing the impacts of project specific greenhouse gas emissions (GHG) on global climate change, the San Joaquin Valley Air Pollution Control District (SJVAPCD) has adopted the guidance: *Guidance for Valley Land-use Agencies in*

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

Environmental Setting

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

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

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

The United Nations IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The IPCC 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 2019, CO_2 accounted for approximately 83 percent of total GHG emissions in the State (CARB, 2018);

- ✓ **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. In 2019, CH_4 accounted for approximately 9 percent of total GHG emissions in the State (CARB, 2022); 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, wastewater 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 CH_4 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 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 predicted that global climate change will contribute to increased average temperatures and more intense heat waves; rising sea levels, which can inundate low-lying areas; changes in precipitation patterns, which could affect water supply; increased risk of wildfire; affect habitat, and other 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 Compressed Natural Gas (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 40 to 44 million by 2046, 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 418.2 MMT of CO2E GHG emissions were produced in California in 2019. CARB also found transportation to be the source of 41 percent of the State's GHG emissions, followed by industrial sources at 24 percent and electricity generation at 14 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 snowpack 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.

- ✓ 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, 2005, 2010, 2015, 2016, 2017, 2018 and 2019 and is summarized in Table 42. 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 six (6) broad sectors and categories. These sectors include agriculture, commercial, electricity power, industrial, residential, and transportation. 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 42
Running Emissions Summary

Economic Sector	Greenhouse Gas Emissions ($MMTCO_2e$)								% of Total	% of Total	% Change in Emission	
	2000	2005	2010	2015	2016	2017	2018	2019	in 2000	in 2019	2000-2019	2018-2019
Agriculture & Forestry	30.97	33.70	33.68	33.53	33.29	32.49	32.75	31.75	6.6%	7.6%	2.5%	-3.1%
Commercial	14.12	15.79	20.09	22.03	23.19	23.40	23.90	24.17	3.0%	5.8%	71.2%	1.1%
Electricity Power	105.26	108.13	90.54	84.96	68.67	62.31	63.25	58.98	22.5%	14.1%	-44.0%	-6.8%
Industrial	104.60	104.76	101.26	101.33	100.28	100.27	100.81	99.91	22.4%	23.9%	-4.5%	-0.9%
Residential	31.73	30.29	32.13	27.95	29.28	30.39	30.48	33.02	6.8%	7.9%	4.1%	8.3%
Transportation	181.28	190.99	170.21	170.92	174.31	175.63	173.95	170.32	38.7%	40.7%	-6.0%	-2.1%
Total Emissions	**468.0**	**483.7**	**447.9**	**440.7**	**429.0**	**424.5**	**425.1**	**418.2**	--	--	**-10.6%**	**-1.6%**

Source: ARB California Greenhouse Gas Inventory for 2000-2019

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 and SB 32, which require statewide GHG reductions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030.

AB 32, S-3-05, and SB 32 target the reduction of statewide emissions. It should be made clear that AB 32, S-3-05, and SB 32 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, SB 32, and SB 375 will be used to assess significance with respect to greenhouse gas (GHG) emissions.

SB 375 requires that MCAG 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 Merced County by CARB are to achieve a 10% reduction in GHG emissions between 2005 and 2020 and a 14% reduction in GHG emissions between 2005 and 2035. The CARB SB 375 Implementation in the San Joaquin Valley document can be obtained from the following link:

https://ww2.arb.ca.gov/sites/default/files/2020-06/SB375_Updated_Final_Target_Staff_Report_2018.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/SCS would result in a significant GHG impact if it:

- ✓ Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.
- ✓ Conflict 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 Merced County. The potential contribution of the 2022 RTP Amendment No. 1 to this cumulative impact is discussed below.

State action on climate change is mandated by AB 32 and SB 32. MCAG, 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, MCAG expects that climate change will be a key environmental consideration in future regional transportation planning. Both MCAG and responsible agencies implementing projects and future land use objectives outlined in the 2022 RTP/SCS Amendment No. 1 will be required to adhere to any future applicable mandatory regulations regarding global warming resulting from the passage of AB 32 and SB 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 2022 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 2022 RTP Amendment No. 1 quantifies GHG emissions associated with the 2022 RTP/SCS Amendment No. 1. The 2022 EIR GHG analysis does not look at GHG emission sources that are non-transportation related (i.e., industrial, commercial, etc.). Neither CEQA nor the CEQA Guidelines mention or provide any methodology for analysis of "greenhouse gases," including CO_2, nor do they provide any 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. MCAG analyzed CO_2 emissions and fuel-consumption impacts from on-road travel resulting from the proposed 2022 RTP/SCS Amendment No. 1.

The impact assessment for GHG emissions focuses on potential effects the Project (2022 RTP/SCS Amendment No. 1) might have on GHG emissions within the Merced Region. The assessment is not site or individual improvement project-specific but is a "regional analysis".

<u>Impact CC 1</u> – Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

The ultimate sources of increased transportation emissions in Merced County are population and employment growth, which will increase with or without projects referenced in the 2022 RTP Amendment No. 1 and land use allocation represented in the SCS. MCAG does not implement land use policy in Merced 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 2022 RTP/SCS Amendment No. 1 is

designed to complement, rather than change, the plans adopted by the local agencies. Thus, the ultimate effect of the 2022 RTP/SCS Amendment No. 1 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.

MCAG'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/SCS could exacerbate climate change and contribute to the significant adverse environmental effects described previously. Furthermore, increased GHG emissions associated with the proposed RTP/SCS could impact implementation of the State's mandatory requirement under AB 32 and SB 32 to reduce statewide GHG emissions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030.

- ✓ **CO2 Emissions**

  Emissions associated with the 2022 RTP/SCS Amendment No. 1 can be divided into two categories: passenger transportation associated with light duty trucks and automobiles (LDTA), and goods movement by truck. Consistency with AB 32 will be evaluated by reviewing the Scoping Plan[1] and evaluating whether the actions in the 2022 RTP/SCS Amendment No. 1 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 2022 RTP/SCS Amendment No. 1 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 2022 RTP/SCS Amendment No. 1.

- ✓ **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 2022 RTP/SCS Amendment No. 1 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

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

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. MCAG evaluated the 2022 RTP/SCS Amendment No. 1 for consistency with SB 375 draft targets for the purposes of evaluating significance for GHG emissions. Updated SB 375 targets for each region were published by the CARB in February 2018. The GHG targets for MPOs within the San Joaquin Valley were set at 10% of the GHG emissions relative to 2005 for 2020 and 14% for 2035 exclusive of emission reductions expected from Pavley GHG Vehicle Standards and the LCFS. CO_2 emissions were projected for 2005, 2020, and 2035 using EMFAC2014 Version model. The 2022 RTP/SCS Amendment No. 1 emissions modeling approach assumes the same 2005 base year CO2 per capita estimate as for the 2018 RTP and adjusts 2020 and 2035 target performance downward to account for fleet mix and emission factor updates between EMFAC2011 used for the 2014 RTP/SCS and EMFAC2014. The EMFAC methodology requested by CARB for the development of the 2022 RTP/SCS Amendment No. 1 is documented in Appendix D of the Draft PEIR.

As shown in Table 43, the GHG emissions for 2020 and 2035 with Scenario 3 (Project) are 21% (2020) and 18% (2035) lower than the GHG emissions level of 2005, exclusive of the savings expected from the Pavley GHG Vehicle Standards and the LCFS. As a result, the RTP would meet CARB per capita emission targets set pursuant to SB 375. The results are the same for Amendment No. 1 and for the 2022 RTP/SCS PEIR. Table 43 also shows that VMT decreases on a per capita basis by 24% in 2020 and 23% in 2035.

TABLE 43
Future VMT and GHG Emissions

Year	Pounds per Capita GHG Emissions[1]	% Change from 2005 EF11 adjusted	VMT Per Capita	% Change from 2005
2005	13.4	--	18.9	--
2020	10.5	-21%	14.4	-24%
2035	10.4	-18%	14.5	-23%

1: Total CO2 Emissions
Source: MCAG, EMFAC 2014

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

1. Ship Electrification at Ports (not applicable in Merced 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 EMFAC2021. GHG emissions results for medium and heavy-duty trucks can be found in Tables 44A (Amendment No. 1) vs Table 44B (2022 RTP/SCS PEIR).

TABLE 44A
GHG Emissions[1] (Goods Movement)
(Tons/Day) - 2023

Year	Total Emissions
2019	2,961
2035	3,404
2046	3,894

1: Total CO2 Emissions
Source: EMFAC 2014

TABLE 44B
GHG Emissions[1] (Goods Movement)
(Tons/Day) - 2022

Year	Total Emissions
2019	2,961
2035	3,404
2046	3,896

1: Total CO2 Emissions
Source: 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 EMFAC2014 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 AB 32 scoping plan for the goods movement sector. The 2022 RTP/SCS Amendment No. 1 does not

hinder the implementation of these plans, and therefore, emissions reductions are anticipated to be consistent with the goals of AB 32 and SB 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 2022 RTP/SCS Amendment No. 1 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. The SJVAPCD has been awarded Prop 1B funding for heavy-duty truck replacement and retrofit projects. Emissions reductions resulting from these projects are outside the scope of the RTP/SCS because the availability and extent of engine retrofits is a site- and project-specific issue and therefore MCAG 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 2010 and 2019, Merced County and its incorporated cities have experienced a wide range of development and population growth. Over the next 24 years, the Merced region will continue to grow rapidly. Between the Year 2019 and 2046, MCAG projects a total employment growth of 27,130 for Merced County. This will accompany an increase in population in the County of 82,101 persons between 2019 and 2046, an increase of 29 percent over the 27-year period. In 2046, the estimated total population for Merced County is 362,542 persons. Table 45 presents the population estimates and projections from 2019 through 2046. The population estimates reflected in Table 45 are the same for Amendment No. 1 and for the 2022 RTP/SCS PEIR.

GHG emissions associated with implementation of the proposed RTP/SCS are primarily related to a projected increase in Countywide VMT as a result of projected growth in the unincorporated areas of Merced County and the incorporated cities. As described previously, MCAG does not have land use authority within the County or the incorporated Cities. Therefore, MCAG's ability to mitigate for climate change impacts in this EIR and the 2022 RTP Amendment No. 1 update is largely limited to Smart Growth Incentives, a focus on the SCS for the 2022 RTP Update, and improvements in alternative modes of transportation that may result in decreases in VMT per capita throughout the County.

TABLE 45
Population of Merced County (2019 – 2046)
2022 RTP/SCS Amendment No. 1 (Scenario 3)

Year	Population	Households	Employment
2019	280,441	80,412	84,400
2020	284,761	82,529	80,882
2035	330,805	103,600	100,533
2046	362,542	114,012	111,484

Source: MCAG, 2023

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 2019 is summarized above. 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 Table 46 for Merced County, which is the same for Amendment No. 1 and the 2022 RTP/SCS PEIR.

TABLE 46
GHG Emissions by Sector

Economic Sector	Greenhouse Gas Emissions ($MMTCO_2e$)			
	2019	2020	2035	2046
Agriculture & Forestry	0.22	0.21	0.20	0.20
Commercial	0.16	0.16	0.16	0.15
Electricity Power	0.40	0.40	0.38	0.37
Industrial	0.68	0.67	0.64	0.63
Residential	0.23	0.22	0.21	0.21
Transportation	1.16	1.14	1.10	1.08

Source: VRPA, 2023

Mitigation Measures

The specific impacts on climate change will be evaluated as part of the implementing 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 MCAG 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 the Air Quality section above to address criteria emissions.

- ✓ **CC 1** MCAG shall update future Regional Transportation Plans (including Sustainable Community Strategies) to incorporate policies and measures that will lead to further reduced GHG emissions. Such policies and measures may be derived from the General Plans, local jurisdictions' Climate Action Plans (CAPs), and other adopted policies and plans of its member agencies that include GHG mitigation and adaptation measures or other sources.

- ✓ **CC 2** Local governments should adopt policies and develop practices that lead to GHG emission reductions. These activities will include, but are not limited to, providing technical assistance and information sharing on developing local Climate Action Plans.

- ✓ **CC 3** Implementing and local agencies should adopt and implement Climate Action Plans (CAPs, also known as Plans for the Reduction of Greenhouse Gas Emissions as described in State CEQA Guidelines Section 15183.5 Tiering and Streamlining the Analysis of Greenhouse Gas Emissions) that do the following:

  - Quantify GHG emissions, both existing and projected over a specified period, resulting from activities within each agency's jurisdiction;
  - Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable;
  - Identify and analyze the GHG emissions resulting for specific actions or categories of actions anticipated within their respective jurisdictions;
  - Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level;
  - Establish a mechanism to monitor the plan's progress toward achieving that level and to require amendment if the plan is not achieving specified levels; and
  - Be adopted in a public process following environmental review.

  CAPs should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change at both the plan and project level. Specifically, at the plan level, land use plans can and should, when appropriate, incorporate planning and land use measures from the California Attorney General's latest list of example policies to address climate change (http://ag.ca.gov/globalwarming/pdf/GP_policies.pdf), including, but not limited to policies from that web page such as:

- Smart growth, jobs/housing balance, transit-oriented development, and infill development through land use designations, incentives and fees, zoning, and public private partnerships.
- Create transit, bicycle, and pedestrian connections through planning, funding, development requirements, incentives and regional cooperation, and create disincentives for auto use.
- Energy and water-efficient buildings and landscaping through ordinances, development fees, incentives, project timing, prioritization, and other implementing tools.
- In addition, implementing and local agencies should incorporate, as appropriate, policies to encourage implementation of the Attorney General's list of project-specific mitigation measures.

In addition, CAPs should also incorporate analysis of climate change adaptation, in recognition of the likely and potential effects of climate change in the future regardless of the level of mitigation and in conjunction with Executive Order S-13-08, which seeks to enhance the state's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of state's first climate adaptation strategy.

✓ **CC 4** MCAG shall continue to work closely with its member agencies to help them participate in the statewide Active Transportation Program (ATP).

✓ **CC 5** Project Level Environmental Documents

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

✓ **CC 6** Off-Model Reduction Strategies

MCAG will work with other affected and responsible agencies to implement the following strategies that are quantified "off-model":

- Regional electric vehicle (EV) charging infrastructure programs.
- Active transportation projects.
- Vanpool program expansion.
- Rideshare programs.
- Rule 9410 Employer Trip Reductions.
- ITS and other TSM projects.

✓ **CC 7** Short-Range Improvement Plan - *Air Quality Measures*

The Short-Range Improvement Plan provides actions that will reduce air emissions between 2022 and 2026. As indicated in the needs assessment sections of the RTP/SCS, the majority of short-term measures improving air quality are related to system, demand, and control management strategies. Local governments, MCAG, and other regional, state, and federal agencies should take

the following actions to facilitate the implementation of strategies necessary to ensure that air quality standards are met:

- MCAG will continue to consult and coordinate with the other seven Valley MPOs and the SJVAPCD in providing focused/unified transportation/air quality planning.
- MCAG and the SJVAPCD will continue to coordinate/consult in activities aimed at achieving both federal and California air quality standards
- Designated responsible governments and agencies will identify and consider Transportation Demand Measures and Transportation Control Measures during State Implementation Plan (SIP) development and carried out where appropriate.
- MCAG will continue to support the SJVAPCD's efforts to integrate appropriate policies and implementation measures identified in the Air Quality Guidelines for General Plans into local general plans.
- MCAG, Merced County and its 6 cities will encourage land-use patterns that reduce automobile dependency, energy consumption and support transit and other alternative modes.
- MCAG will encourage local transit agencies to replace aging fleets with alternative-fueled buses.
- MCAG and local transit agencies will support greater funding flexibility for bus purchases to promote the most energy-efficient models.
- MCAG, in cooperation with Caltrans, will promote park-and-ride lots and parking management strategies where appropriate.
- MCAG, Caltrans, cities and the county support alternate fuel strategies to reduce petroleum fuels. Alternative fuel technology can have a significant impact on reducing petroleum-based fuel consumption.

✓ **CC 8** San Joaquin Valley Clean Transportation Center

The San Joaquin Valley Clean Transportation Center, which opened in January 2016, provided an additional advancement in clean energy education and incorporation into both residential and business fleets. The Center provides a new regional resource in helping to improve air quality and reduce vehicle emissions. The Center has strong connections and relations with a national network of manufacturers, suppliers and fleets to help improve the regional transportation system. Funding is provided by a California Energy Commission grant through CALSTART.

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 increased transportation GHG emissions on climate change, 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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Merced County is estimated to grow in population by an estimated 82,101 persons between 2019 and 2046. MCAG has used the best available information to determine whether the 2022 RTP/SCS Amendment No. 1 is consistent with the State's achievement of the AB 32 GHG emission reductions and addresses SB 375 mandates. Implementation of the mitigation measures described above will assist in the reduction of per capita VMT levels throughout Merced County, which will assist in meeting the stated goals of AB 32 and requirements set forth in SB 375. The 2022 RTP/SCS Amendment No. 1 has included numerous projects, action items, funding priorities, a land use allocation to support an active transportation system, and programs to develop and improve alternative modes of transportation throughout the County. MCAG will continue to coordinate with local land use agencies to assist in the development of plans and policies aimed at reducing VMT.

GHG emissions for 2020 and 2035 with the Project are between 21% (2020) and 18% (2035) lower than the GHG emissions level of 2005, as indicated above. As a result, the RTP would meet ARB per capita emission targets set pursuant to SB 375. Mitigation measures that are presented above help reduce GHG emissions even further 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.

Impact CC 2 – Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases.

As noted previously, California passed the California Global Warming Solutions Act of 2006. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. Under AB 32, CARB must adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020. On December 11, 2008, CARB adopted its initial 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's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan.

In accordance with AB 32, CARB developed the 2008 Scoping Plan to outline the State's strategy to achieve 1990 level emissions by year 2020. To estimate the reductions necessary, CARB projected statewide 2020 BAU GHG emissions (i.e., GHG emissions in the absence of statewide emission reduction measures). CARB identified that the State as a whole would be required to reduce GHG emissions by 28.5 percent from year 2020 BAU to achieve the targets of AB 32. The GHG emissions forecast was updated as part of the First Update to the Scoping Plan. In the First Update to the Scoping Plan, CARB projected that statewide BAU emissions in 2020 would be approximately 509 million MTCO2e. Therefore, to achieve the AB 32 target of 431 million MTCO2e (i.e., 1990 emissions levels) by 2020, the State would need to reduce emissions by 78 million MTCO2e compared to BAU conditions, a reduction of 15.3 percent from BAU in 2020. Several statewide strategies to reduce GHG

emission are identified in the 2008 Scoping Plan and would ensure the State is on target to achieve the GHG emissions reduction goals of AB 32.

Statewide GHG emissions reduction measures that are being implemented would apply to future development and vehicle travel allowed under the updated Comp Plan and would therefore reduce the Region's future GHG emissions. As described in the 2014 First Update to the Scoping Plan, as California continues to build its climate policy framework, there is a need for local government climate action planning to adopt mid-term and long-term reduction targets that are consistent with scientific assessments and the statewide goal of reducing emissions 80 percent below 1990 levels by 2050.

CARB identifies that local government reduction targets should chart a reduction trajectory that is consistent with, or exceeds, the trajectory created by statewide goals. CARB has completed the 2030 Target Scoping Plan Update to address the new interim GHG reduction target for 2030 under SB 32 of 40 percent below 1990 levels (November 2017). The California Air Resources Board (CARB) is responsible for ensuring that California meets this goal. The bill went into effect January 1, 2017.

The 2030 Target Scoping Plan update focuses on statewide strategies to achieve the GHG reductions for year 2030 required under SB 32, which are a 40 percent reduction from 1990 levels. There is no legislative target or plans being prepared to address the GHG reductions needed to achieve the long-term GHG goal for 2050 identified in Executive Order S-03-05 because it is not a State legislative target. Consequently, consistency with statewide GHG reduction strategies focuses on consistency with plans adopted to achieve the legislative target for year 2020 established under AB 32 and outlined in the Scoping Plan.

SB 375 requires MPOs to adopt a SCS or APS that will prescribe land use allocation in that MPO's regional transportation plan. For the MCAG region, CARB set targets at 10% per capita decrease in 2020 and a 14% per capita decrease in 2035 from a base year of 2005. As shown above, the GHG emissions for 2020 and 2035 with the Project are between 21% (2020) and 18% (2035) lower than the GHG emissions level of 2005, exclusive of the savings expected from the Pavley GHG Vehicle Standards and the LCFS. As a result, the RTP would meet ARB per capita emission targets set pursuant to SB 375.

Executive Order B-30-15 establishes a California greenhouse gas reduction target of 40 percent below 1990 levels by 2030 to ensure California meets its target of reducing greenhouse gas emissions to 80 percent below 1990 levels by 2050. Executive Order B-30-15 requires MPO's to implement measures that will achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets.

✓ **Greenhouse Gas Reduction**

MCAG has used the best available information to determine whether the proposed RTP/SCS is consistent with the State's achievement of the AB 32 and SB 32 GHG emission reductions. In light of the uncertainty in the regulatory and technological environment, the 2022 RTP/SCS incorporates all feasible mitigation measures, which are identified below, to reduce the impacts of the proposed project on global climate change. This EIR also includes a requirement that RTP

projects incorporate the SJVAPCD's Best Performance Standards for reducing GHG. The RTP has also incorporated numerous policies, action items and funding priorities to develop and improve alternative modes of transportation throughout the County and the incorporated cities in Merced County.

The measures included in the RTP are consistent with the GHG mitigation approaches outlined by the California Attorney General's Office in the May 21, 2008 report titled: *The California Environmental Quality Act, Addressing Global Warming Impacts at the Local Agency Level: Global Warming Measures*. The RTP 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 2022 RTP update, such as the SCS and the analysis of GHG emissions from the Project, are also consistent with the 2017 Regional Transportation Plan Guidelines prepared by the California Transportation Commission, which address SB 375 mandates.

✓ **SJVAPCD Best Performance Standards (BPS)**

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

Mitigation Measures

✓ See Mitigation Measures CC 1 through CC 8 above for Impact CC 1.

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 increased transportation GHG emissions on climate change, 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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Merced County is estimated to grow in population by an estimated 82,101 persons between 2019 and 2046. MCAG has used the best available information to determine whether the 2022 RTP/SCS Amendment No. 1 is consistent with the State's achievement of the AB 32 GHG emission reductions and addresses SB 375 mandates. Implementation of the mitigation measures described above will assist in the reduction of per capita VMT levels throughout Merced County, which will assist in meeting the stated goals of AB 32 and requirements set forth in SB 375. The 2022 RTP/SCS Amendment No. 1 has included numerous projects, action items, funding priorities, a land use allocation to support an active transportation system, and programs to develop and improve alternative modes of transportation throughout the County. MCAG will continue to coordinate with local land use agencies to assist in the development of plans and policies aimed at reducing VMT.

GHG emissions for 2020 and 2035 with the Project are between 21% (2020) and 18% (2035) lower than the GHG emissions level of 2005, as indicated above. As a result, the RTP would meet ARB per capita emission targets set pursuant to SB 375. Mitigation measures that are presented above help reduce GHG emissions even further 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.

Findings

Comparing the results of the tables above reflective of the proposed Amendment No. 1 compared to the analysis contained in the 2022 RTP/SCS PEIR, changes are minimal and insignificant. As such, the analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No. 1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant greenhouse gas emissions and climate change impacts or a substantial increase in the severity of greenhouse gas emissions and climate change impacts beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.6 Cultural and Tribal Resources

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to cultural resources beyond those already identified in the 2022 RTP/ SCS PEIR. The 2022 RTP/SCS PEIR determined that the development of new transportation and land use strategies may affect archaeological and paleontological resources, primarily through the disturbance of buried resources. Additionally, the development of transportation projects and land use strategies may affect historic tribal and architectural resources (structures 50 years or older), either through direct affects to buildings or through indirect affects to the area surrounding a resource if it creates a visually incompatible structure adjacent to a historic structure (reference the 2022 RTP/SCS PEIR, pages 3-195 through 3-226). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects

(as revised by the 2022 RTP/ SCS Amendment No.1) at the program level. Thus, the incorporation of the proposed changes to the Project List would not result in any new significant impacts to cultural and tribal resources, or a substantial increase in the severity of impacts to cultural resources beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.8 Energy and Energy Conservation

The 2022 RTP/SCS would result in energy impacts as a result of increased energy demands for construction of transportation projects and development, increase energy demands for operation of the regional transportation system and the growing energy demand from anticipated growth and development associated with implementation of the 2016 RTP/SCS. The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No. 1 are not expected to cause any new or a substantial increase in the severity of significant impacts to energy beyond those already described in the previously certified 2022 RTP/SCS PEIR.

This section describes the environmental and regulatory setting for energy in the Merced County region and analyzes the potential energy impacts resulting from the implementation of MCAG's 2022 RTP/SCS Amendment No.1. This section portrays the existing energy conditions in the Merced County region, related energy regulations, the energy impacts of project construction and operation, and where necessary and feasible, identification of any mitigation measures required to reduce impacts. Based on the results of analyzing the 2022 RTP/SCS Amendment No. 1, no additional or revised mitigation measures or levels of significance will change from the 2022 RTP/SCS PEIR certified in August 2022.

This section documents the existing energy resources and analyzes the effects on energy consumption and conservation that would result from implementing the proposed RTP/SCS and has been revised to reflect the latest impact results reflective of the 2022 RTP/SCS and Amendment No.1. The 2022 RTP/SCS PEIR section related to Energy and Energy Conservation can be found on Pages 3-227 through 3-249 of the Draft PEIR.

The section has been revised to reflect the latest impact results reflective of the 2022 RTP/SCS and Amendment No.1. As noted previously, where table results with Amendment No. 1 have changed, the original table from the certified 2022 RTP/SCS PEIR is also provided below it to compare results. In almost all cases, changes are insignificant, or impacts are reduced with Amendment No. 1. As a result of these analyses, changes reflected in the 2022 RTP/SCS Amendment No.1 will not cause additional significant environmental effects referenced in the 2022 RTP/SCS PEIR.

Regulatory Setting

Federal

- ✓ **Energy Policy and Conservation Act of 1975** - The Energy Policy and Conservation Act 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, which is part of the USDOT, is responsible for establishing additional vehicle standards and for revising existing standards. Since 1990, the fuel economy standard for new passenger cars has been 27.5 mpg. Since 1996, the fuel economy standard for new light trucks (gross vehicle weight of 8,500 pounds or less) has been 20.7 mpg. Heavy-duty vehicles (i.e., vehicles and trucks over 8,500 pounds gross vehicle weight) are not currently subject to fuel economy standards. Compliance with federal fuel economy standards is determined on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the U.S. The Corporate Average Fuel Economy (CAFE) program, which is administered by the EPA, was created to determine vehicle manufacturers' compliance with the fuel economy standards. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. Based on the information generated under the CAFE program, the USDOT is authorized to assess penalties for noncompliance.

- ✓ **Clean Air Act (CAA) of 1970** - The Clean Air Act is a United States federal law designed to control air pollution on a national level. It is one of the United States' first and most influential modern environmental laws, and one of the most comprehensive air quality laws in the world. As with many other major U.S. federal environmental statutes, it is administered by the U.S. Environmental Protection Agency (EPA), in coordination with state, local, and tribal governments. Its implementing regulations are codified at 40 C.F.R. Subchapter C, Parts 50-97.
  The 1955 Air Pollution Control Act was the first U.S. federal legislation that pertained to air pollution; it also provided funds for federal government research of air pollution. The first federal legislation to actually pertain to "controlling" air pollution was the Clean Air Act of 1963. The 1963 act accomplished this by establishing a federal program within the U.S. Public Health Service and authorizing research into techniques for monitoring and controlling air pollution.

  It was first amended in 1965, by the Motor Vehicle Air Pollution Control Act, which authorized the federal government to set required standards for controlling the emission of pollutants from certain automobiles, beginning with the 1968 models. A second amendment, the Air Quality Act of 1967, enabled the federal government to increase its activities to investigate enforcing interstate air pollution transport, and, for the first time, to perform far-reaching ambient monitoring studies and stationary source inspections. The 1967 act also authorized expanded studies of air pollutant emission inventories, ambient monitoring techniques, and control techniques.

  Amendments approved in 1970 greatly expanded the federal mandate, requiring comprehensive federal and state regulations for both stationary (industrial) pollution sources and mobile sources. It also significantly expanded federal enforcement. Also, EPA was established on December 2, 1970 for the purpose of consolidating pertinent federal research, monitoring, standard-setting, and enforcement activities into one agency that ensures environmental protection.

  Further amendments were made in 1990 to address the problems of acid rain, ozone depletion, and toxic air pollution, and to establish a national permit program for stationary sources, and increased enforcement authority. The amendments also established new auto gasoline

reformulation requirements, set Reid vapor pressure (RVP) standards to control evaporative emissions from gasoline, and mandated new gasoline formulations sold from May to September in many states.

- ✓ **National Energy Act of 1978** - In response to the energy crisis in the 1970s, Congress passed the National Energy Act of 1978 (NEA) to establish energy efficiency programs, tax incentives, tax disincentives, energy conservation programs, alternative fuel programs, and regulatory and market-based initiatives. It includes five statutes:

  - Public Utility Regulatory Policies Act (PURPA) (Public Law 95–617)
  - Energy Tax Act (Public Law 95–618)
  - National Energy Conservation Policy Act (NECPA) (Public Law 95–619)
  - Power Plant and Industrial Fuel Use Act (Public Law 95–620)
  - Natural Gas Policy Act (Public Law 95–621)

  Of the five statutes, one, PURPA, is relevant to the consideration of the 2022 RTP/SCS Amendment No. 1.

- ✓ **Public Utility Regulatory Policies Act of 1978 (PURPA)** - PURPA was passed in response to the unstable energy climate of the late 1970s. PURPA sought to promote conservation of electric energy. Additionally, PURPA created a new class of nonutility generators, small power producers, from which, along with qualified cogenerators, utilities are required to buy power.

  PURPA was in part intended to augment electric utility generation with more efficiently produced electricity and to provide equitable rates to electric consumers. Utility companies are required to buy all electricity from "Qfs" (qualifying facilities) at avoided cost (avoided costs are the incremental savings associated with not having to produce additional units of electricity). PURPA expanded participation of nonutility generators in the electricity market and demonstrated that electricity from nonutility generators could successfully be integrated with a utility's own supply. PURPA requires utilities to buy whatever power is produced by Qfs (usually cogeneration or renewable energy). Utilities want these provisions repealed, critics argue that it will decrease competition and impede development of the renewable energy industry. The Fuel Use Act (FUA) of 1978 (repealed in 1987) also helped Qfs become established. Under FUA, utilities were not allowed to use natural gas to fuel new generating technologies, but Qfs which were by definition not utilities, were able to take advantage of abundant natural gas and abundant new technologies (such as combined cycle). The technologies lowered the financial threshold for entrance into the electricity generation business as well as shortened the lead time for constructing new plants.

- ✓ **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 also 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 by President Bush on August 8, 2005. Generally, the act includes provisions 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.

- ✓ **Energy Independence and Security Act of 2007** - The Energy Independence and Security Act (EISA; Public Law 110-140) was signed into law by President George W. Bush on December 19, 2007. The Act's goal is to achieve energy security in the United States by increasing renewable fuel production, improving energy efficiency and performance, protecting consumers, improving vehicle fuel economy, and promoting research on greenhouse gas capture and storage. Under the EISA, the RFS program (RFS2) was expanded in several key ways:

  - EISA expanded the RFS program to include diesel, in addition to gasoline.
  - EISA increased the volume of renewable fuel required to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022.
  - EISA established new categories of renewable fuel and set separate volume requirements for each one.
  - EISA required EPA to apply lifecycle greenhouse gas performance threshold standards to ensure that each category of renewable fuel emits fewer greenhouse gases than the petroleum fuel it replaces.

  RFS2 lays the foundation for achieving significant reductions of greenhouse gas emissions from the use of renewable fuels, for reducing imported petroleum, and encouraging the development and expansion of our nation's renewable fuels sector. The EISA also includes a variety of new standards for lighting and for residential and commercial appliance equipment. The equipment includes residential refrigerators, freezers, refrigerator-freezers, metal halide lamps, and commercial walk-in coolers and freezers.

- ✓ **Moving Ahead for Progress in the 21st Century (MAP-21)** - MAP-21, the Moving Ahead for Progress in the 21st Century Act (P.L. 112-141), was signed into law by President Obama on July 6, 2012. The ACT is the first long-term highway endorsement enacted since 2005 and creates an efficient multimodal plan that will handle the numerous challenges facing the nation's transportation network. Some of the challenges facing our nation's transportation system include safety improvements, reducing travel times, creating a more efficient system for the freight movement, and improving project delivery time. MAP-21 also supports the programs and policies enacted in 1991, which were related to the advancement of the highway, transit, bike, and pedestrian system.

- ✓ **Fixing America's Surface Transportation (FAST) Act** - On December 4, 2015, President Obama signed the Fixing America's Surface Transportation (FAST) Act (Pub. L. No. 114-94) into law—the

first federal law in over a decade to provide long-term funding certainty for surface transportation infrastructure planning and investment. The FAST Act authorizes $305 billion over fiscal years 2016 through 2020 for highway, highway and motor vehicle safety, public transportation, motor carrier safety, hazardous materials safety, rail, and research, technology, and statistics programs. The FAST Act maintains our focus on safety, keeps intact the established structure of the various highway-related programs we manage, continues efforts to streamline project delivery and, for the first time, provides a dedicated source of federal dollars for freight projects. With the enactment of the FAST Act, states and local governments are now moving forward with critical transportation projects with the confidence that they will have a federal partner over the long term.

- ✓ **Heavy-Duty National Program** - The Heavy-Duty National Program was adopted on August 9, 2011, to establish the first fuel efficiency requirements for medium- and heavy-duty vehicles beginning with the model year 2014.

Proposed Rulemaking: Phase 2 Greenhouse Gas Emissions Standards and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines and Vehicles

As of June 2015, The U.S. Environmental Protection Agency (EPA) and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) are jointly proposing a national program that would establish the next phase of greenhouse gas (GHG) emissions and fuel efficiency standards for medium- and heavy-duty vehicles. The Phase 2 program significantly reduces carbon emissions and improves the fuel efficiency of heavy-duty vehicles, helping to address the challenges of global climate change and energy security. Phase 2 would save the heavy-duty vehicle industry billions of dollars' worth of fuel, reduce the cost of transporting goods, cut fuel consumption, and reduce GHG emissions by 1 billion metric tons. Fuel consumption of tractor trailers alone could decrease by 24 percent. The proposed Phase 2 standards, which begin in the model year 2021 (model year 2018 for trailers and 2021 for NHTSA's trailer standards) and culminate in standards for model year2027, are the product of a comprehensive assessment of existing and advanced technologies and extensive stakeholder outreach.[2]

- ✓ **Executive Order 13514, Federal Leadership in Environmental, Energy, an Economic Performance -** Executive Order (EO) 13514 was signed by President Obama on October 5, 2009. It expands on the energy reduction and environmental performance requirements for federal agencies identified in EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management. The goals of EO 13514 are as follows:
  - ➢ Reduce petroleum consumption by 2% per year through FY2020 (applies to agencies with fleets of more than 20 vehicles) (Baseline FY2005). Reduce by 2% annually:
    - Potable water intensity by FY2020 (26% total reduction) (Baseline FY2007).
    - Industrial, landscaping, and agricultural water intensity by FY2020 (20% total reduction) (Baseline FY2010).

[2] Environmental Protection Agency. June 2015. *Cutting Carbon Pollution, Improving Fuel Efficiency, Saving Money, and Supporting Innovation for Trucks*. Available at: **http://www3.epa.gov/otaq/climate/documents/420f15900.pdf**

- Achieve 50% or higher diversion rate:
  - Non-hazardous solid waste by FY2015.
  - Construction and demolition materials and debris by FY2015.
- Ensure at least 15% of existing buildings and leases (>5,000 gross square feet) meet the Guiding Principles by FY2015, with continued progress towards 100%.
- Ensure 95% of all new contracts, including non-exempt contract modifications, require products and services that are energy-efficient, water-efficient, bio-based, environmentally preferable, non-ozone depleting, contain recycled-content, non-toxic or less-toxic alternatives.

✓ **Executive Order 13693, Planning for Federal Sustainability in the Next Decade** - EO 13693 was signed by President Obama on October 5, 2009. The goal of EO 13693 is to maintain federal leadership in sustainability and GHG emissions reductions. EO 13693 promotes building energy conservation, efficiency, and management by reducing agency building energy intensity measured in British thermal units per gross square foot by 2.5 percent annually through the end of fiscal year 2025, relative to the baseline of the agency's building energy use in fiscal year 2015 and considering agency progress to date. EO 13693 also sets agency water use efficiency standards and management practices as well as mandates a fleet-wide per-mile GHG emissions reduction from agency fleet vehicles.

State of California

✓ **Senate Bill 1078, California Renewables Portfolio Standard Program** - SB 1078 establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 1078 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least 1 percent each year. The outcomes of this legislation will impact regional transportation powered by electricity.

✓ **Senate Bill 1389** - In 2002, the Legislature reconstituted the State's responsibility to develop an integrated energy plan for electricity, natural gas, and transportation fuels. The California Energy Commission (CEC) adopts and transmits to the Governor and Legislature a report of findings every 2 years. That report is called the Integrated Energy Policy Report (IEPR). The 2016 Integrated Energy Policy Report was adopted by the CEC on March 28, 2016. These reports make recommendations to increase California's energy supplies, reduce energy demand, broaden the range of alternatives to conventional energy sources, and improve the State's energy delivery infrastructure.

✓ **Assembly Bill 2075, California Strategy to Reduce Petroleum Dependence** - AB 2075 (Chapter 936, Statutes of 2000) requires the CEC and the Air Resources Board (ARB) to develop and submit to the Legislature a strategy to reduce petroleum dependence in California. The statute requires the strategy to include goals for reducing the rate of growth in the demand for petroleum fuels. In addition, the strategy is required to include recommendations to increase transportation

energy efficiency as well as the use of nonpetroleum fuels and advanced transportation technologies including alternative fuel vehicles, hybrid vehicles, and high-fuel efficiency vehicles.

The strategy, Reducing California's Petroleum Dependence, was adopted by the CEC and ARB 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 SUVs; and increase the use of nonpetroleum fuels to 20 percent of on-road fuel consumption by 2020 and 30 percent by 2030.

- ✓ **Assembly Bill 1007, Alternative Fuels Plan** - AB 1007 requires the CEC to prepare a state plan to increase the use of alternative fuels in California. The plan shall include an evaluation of alternative fuels for emissions or criteria air pollutants, air toxics, GHGs, water pollutants, and other harmful substances, and their impacts on petroleum consumption. The plan shall set goals for increased alternative fuel use in the state for the years 2012, 2017, and 2022 and recommend policies to ensure the alternative fuel goals are attained, including standards on transportation fuels and vehicle and policy mechanisms to ensure vehicles operating on alternative fuels use those fuels to the maximum extent feasible. The plan was adopted in December 2007.

- ✓ **Executive Order #S-06-06, Bioenergy Action Plan** - Executive Order #S-06-06 establishes targets for the use and production of biofuels and bio-power 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-01-07, Governor's Low Carbon Fuel Standard** - Executive Order #S-01-07 establishes a statewide goal to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 through establishment of a Low Carbon Fuel Standard. The Low Carbon Fuel Standard shall be incorporated into the State Alternative Fuels Plan required by AB 1007 and is one of the proposed discrete early action GHG reduction measures identified by ARB pursuant to AB 32.

- ✓ **Senate Bill 1 (Million Solar Roofs)** - The Million Solar Roofs program under SB 1 (2006) sets a goal to install 3,000 megawatts of new solar capacity by 2017, moving the state toward a cleaner energy future and helping lower the cost of solar systems for consumers. This is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. It provides up to $3.3 billion in financial incentives that decline over time.

- ✓ **Senate Bill 1368, Greenhouse Gas Emissions Performance Standard for Major Power Plant Investments** - SB 1368 was passed in September 2006 and requires the CEC to develop and adopt

by regulation a GHG emissions performance standard for long-term procurement of electricity by local publicly owned utilities.

- ✓ **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.

  On December 11, 2008, CARB adopted its initial 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's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan. The current plan has identified new policies and actions to accomplish the State's 2030 GHG limit.

- ✓ **Assembly Bill 758 Energy: Energy Audit** - New state law promulgated under AB 758 mandates the California Energy Commission (CEC) to develop a comprehensive energy efficiency program for existing buildings. This bill will be implemented in three phases. In phase I, during the American Recovery and Reinvestment Act of 2009 (ARRA) implementation period (2010–2012), the CEC used ARRA funds to do state and local upgrade programs, workforce training, financing, and an outreach campaign. The CEC published the Comprehensive Energy Efficiency Program for Existing Buildings Scoping Report and adopted the AB 758 Action Plan. Phase II will focus on implementing the roadmap necessary for foundational No Regrets Strategies to take hold and Voluntary Pathways to scale to achieve energy efficiency goals, partnerships, and market development.

Phase III will develop and institute Mandatory Approaches that will move energy efficiency practices into the mainstream. Transformation and maturation of the energy efficiency marketplace will require the formation of partnerships and cooperation among all stakeholders.[3]

On August 28, 2015, the CEC published the final version of the Existing Buildings Energy Efficiency Action Plan. The Plan provides a 10-year roadmap to activate market forces and transform California's existing residential, commercial, and public building stock into high-performing and energy-efficient buildings.

The results of this effort will be accelerated growth of energy efficiency markets, more effective targeting and delivery of building upgrade services, improved quality of occupant and investor decisions, and vastly improved performance of California's buildings. Equally important, this effort will deliver substantial energy savings and greenhouse gas emissions reductions, contributing to the collective goal of reducing the impacts of climate change while improving the resilience of the state's built environment and economy.[4]

- ✓ **Assembly Bill 1493 (2009) / Advanced Clean Cars Program** - The Advanced Clean Cars Program under AB 1493 (referred to as Pavley I), requires the California Air Resources Board (CARB) to develop and adopt standards for vehicle manufacturers to reduce GHG emissions coming from passenger vehicles and light-duty trucks at a "maximum feasible and cost-effective reduction" by January 1, 2005. Pavley I took effect for model years starting in 2009 to 2016 and Pavley II, which is now referred to as "LEV (Low Emission Vehicle) III GHG" will cover 2017 to 2025. Fleet average emission standards would reach 22 percent reduction by 2012 and 30 percent by 2016.[5]

  As of January 2012, CARB adopted the Advanced Clean Cars program to extend AB 1493 through model years 2017 to 2025. This program will promote all types of clean fuel technologies such as plug-in hybrids, battery electric vehicles, compressed natural gas (CNG) vehicles, and hydrogen powered vehicles while reducing smog and saving consumers' money in fuel costs. By 2025, when the rules will be fully implemented:
  - New automobiles will emit 34 percent fewer global warming gases and 75 percent fewer smog-forming emissions.
  - Environmentally superior cars will be available across the range of models, from compacts, to SUVs, pickups, and minivans.

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[3] California Energy Commission. Accessed September 1, 2015. *Comprehensive Energy Efficiency Program for Existing Buildings.* Available at: **http://www.energy.ca.gov/ab758/**

[4] California Energy Commission. 28 August 2015. *Existing Buildings Energy Efficiency Action Plan*. Available at: **http://docketpublic.energy.ca.gov/PublicDocuments/15-IEPR 05/TN205919_20150828T153953_Existing_Buildings_Energy_Efficiency_Action_Plan.pdf**

[5] California Air Resources Board. 6 May 2013. *Clean Car Standards – Pavley, Assembly Bill 1493*. Available at: **http://www.arb.ca.gov/cc/ccms/ccms.htm**

- Consumer savings on fuel costs will average $6,000 over the life of the car. The savings more than offsets the average $1,900 increase in vehicle price for the ultra-clean, high efficiency technology.[6]

✓ **Senate Bill 2 Renewable Portfolio Standard** - California's Renewable Portfolios Standard (RPS), under Senate Bill (SB) 2 of 2011, sets a procurement goal for electricity retail sellers including investor-owned utilities, electric service providers, and community choice aggregators to 33 percent renewable energy sources by 2020. The RPS has three compliance periods: Period 1 (2011–2013), Period 2 (2014–2016), and Period 3 (2017–2020) as intermediate targets before full compliance in 2020. The CEC is responsible for designating electrical generation facilities as renewable energy sources and enforcing RPS.[7]

✓ **Senate Bill No. 100 (SB 100) California Renewables Portfolio Standard Program: emissions of greenhouse gases** – SB 100 amends the Renewable Portfolio Standard's legislative findings and declarations to indicate that the program's goal is to reach a 50 percent renewable resource target by December 31, 2026, and a 60 percent target by December 31, 2030. The bill would require retail sellers and local publicly owned electric utilities to procure a minimum quantity of electricity products from eligible renewable energy resources, with 44 percent of total kilowatt hours sold to retail end-use customers by December 31, 2024, 52 percent by December 31, 2027, and 60 percent by December 31, 2030.

✓ **Part 11 of the California Code of Regulations: Green Building Code** - The California Green Building Standards Code, which is Part 11 of the California Code of Regulations, is commonly referred to as the CALGreen Code. The 2008 edition, the first edition of the CALGreen Code, contained only voluntary standards. The 2010 CALGreen Code is a code with mandatory requirements for state-regulated buildings and structures throughout California beginning on January 1, 2011. The code requires building commissioning, which is a process for the verification that all building systems, such as heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

✓ **California Building Energy Efficiency Standards: 2013 Title 24, Part 6 (California Energy Code)** - The Code California Energy Code (Title 24, Section 6) was created as part of the California Building Standards Code (Title 24 of the California Code of Regulations) by the California Building Standards Commission in 1978 to establish statewide building energy efficiency standards to reduce California's energy consumption. These standards include provisions applicable to all buildings, residential and nonresidential, which describe requirements for documentation and certificates that the building meets for the following types of systems, equipment, and appliances:

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[6] California Air Resources Board. Accessed 20 August 2015. California's Advanced Clean Car Program. Available at: **http://www.arb.ca.gov/msprog/consumer_info/advanced_clean_cars/consumer_acc.htm**

[7] California Public Utilities Commission. 6 April 2015. California Renewables Portfolio Standard. Available at: **http://www.cpuc.ca.gov/PUC/energy/Renewables/California Building Standards Commission**. Accessed 26 June 2015. History. Available at: **http://www.bsc.ca.gov/abt_bsc/history.aspx**

- Air conditioning systems
- Heat pumps
- Water chillers
- Gas- and oil-fired boilers
- Cooling equipment
- Water heaters and equipment
- Pool and spa heaters and equipment
- Gas-fired equipment including furnaces and stoves/ovens
- Windows and exterior doors
- Joints and other building structure openings ("envelope")
- Insulation and cool roofs
- Lighting control devices

The standards include additional mandatory requirements for space conditioning (cooling and heating), water heating, and indoor and outdoor lighting systems and equipment in non-residential, high-rise residential, and hotel or motel buildings. Mandatory requirements for low-rise residential buildings cover indoor and outdoor lighting, fireplaces, space cooling and heating equipment (including ducts and fans), and insulation of the structure, foundation, and water piping. In addition to the mandatory requirements, the standards call for further energy efficiency that can be provided through a choice between performance and prescriptive compliance approaches. Separate sections apply to low-rise residential and to non-residential, high-rise residential, and hotel or motel buildings. In buildings designed for mixed use (e.g., commercial, and residential), each section must meet the standards applicable to that type of occupancy.

The performance approach set forth under these standards provides for the calculation of an energy budget for each building and allows flexibility in building systems and features to meet the budget. The energy budget addresses space-conditioning (cooling and heating), lighting, and water heating. Compliance with the budget is determined by the use of a CEC-approved computer software energy model. The alternative prescriptive standards require demonstrating compliance with specific minimum efficiency for components of the building such as building envelope insulation R-values, fenestration (areas, U-factor and solar heat gain coefficients of windows and doors) and heating and cooling, water heating and lighting system design requirements. These requirements vary depending on the building's location in the state's 16 climate zones.

California's Building Energy Efficiency Standards are updated on an approximately three-year cycle as technology and methods have evolved. As a result of new law under AB 970, passed in the fall of 2000 in response to the state's electricity crisis, an emergency update of the standards went into effect in June 2001. The CEC then initiated an immediate follow-on proceeding to consider and adopt updated standards that could not be completed during the emergency proceeding. The 2013 Standards went into effect July 1, 2014. The 2016 Standards, which will go into effect on January 1, 2017, will continue to improve upon the current 2013 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings.

The 2013 Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings and include requirements that will enable both demand reductions during critical peak periods and future solar electric and thermal system installations.

- ✓ **California Senate Bill 350** - SB 350 was approved by Governor Brown on October 7, 2015. SB 350 will: (1) increase the standards of the California RPS program by requiring that the amount of electricity generated and sold to retail customers per year from eligible renewable energy resources be increased to 50 percent by December 31, 2030; (2) require the State Energy Resources Conservation and Development Commission to establish annual targets for statewide energy efficiency savings and demand reduction that will achieve a cumulative doubling of statewide energy efficiency savings in electricity and natural gas final end uses of retail customers by January 1, 2030; (3) provide for the evolution of the Independent System Operator (ISO) into a regional organization; and (4) require the state to reimburse local agencies and school districts for certain costs mandated by the state through procedures established by statutory provisions. Among other objectives, the Legislature intends to double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

- ✓ **California Solar Initiative** - On January 12, 2006, the California Public Utilities Commission (CPUC) approved the California Solar Initiative (CSI; R.04-03-017), which provides $2.9 billion in incentives between 2007 and 2017. The CPUC will oversee a $2.5 billion program for commercial and existing residential customers, funded through revenues and collected from gas and electric utility distribution rates. Furthermore, the CEC will manage $350 million targeted for new residential building construction, utilizing funds already allocated to the CEC to foster renewable projects between 2007 and 2011.

  On March 2, 2006, the CPUC opened a proceeding to develop rules and procedures for the California Solar Initiative and to continue consideration of policies for the development of cost-effective, clean, and reliable distributed generation. On August 21, 2006, the governor signed SB 1, which directs the CPUC and the CEC to implement the CSI program consistent with specific requirements and budget limits set forth in the legislation and directs the CPUC and the CEC to create 3,000 megawatts of new, solar-produced electricity by 2017.

  The CPUC has a rulemaking in progress to reconcile its decisions with SB 1, and it also continues to hold public workshops to continue designing program elements. Current incentives provide an upfront, capacity-based payment for a new system. The CSI incentive system will change in 2007 when it moves to performance-based payments. In its August 24, 2006, decision, the CPUC shifted the program from volume-based to performance-based incentives and clarified many elements of the program's design and administration.[8]

[8] California Solar Initiative. Accessed 31 October 2007. Website. Available at: **http://www.gosolarcalifornia.ca.gov/csi/index.html**

- ✓ **California Cap and Trade Program** - CARB adopted the California Cap and Trade Program final regulations on October 20, 2011. An amended regulation was adopted on September 12, 2012, with the first auction for GHG allowances on November 14, 2012. The cap and trade program is a market-based mechanism to reduce GHG emissions in a cost-effective and economically efficient manner. California is the first multi-sector cap and trade program in North America following the northeast Regional Greenhouse Gas Initiative (RGGI) and the European Union Emission Trading Scheme (EU-ETS). It sets a GHG emissions limit that will decrease by 2 percent each year until 2015 and then 3 percent from 2015 to 2020 to achieve the goals set forth in AB 32. The program initially applies to large electric power plants and large industrial plants but will include fuel distributors by 2015. By 2015, these rules will apply to 85 percent of all of California's GHG emissions.

- ✓ **Scoping Plan and First Update of the Scoping Plan** - Pursuant to AB 32, CARB developed a Scoping Plan to detail the approach towards reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first considered by CARB in 2008 and must be updated every five years. CARB approved the First Update to the Climate Change Scoping Plan on May 22, 2014.[9] The First Update identifies opportunities to leverage existing and new funds to further drive GHG emissions reductions through strategic planning and targeted low carbon investments. The First Update defines CARB's climate change priorities for the next five years, and also sets the groundwork to reach long-term goals set forth in EO S-3-05 and EO B-16-2012 (below). The Update highlights California's progress toward meeting the "near-term" 2020 GHG emissions reduction goals defined in the initial Scoping Plan. It also evaluates how to align the State's "longer-term" GHG reduction strategies with other State policy priorities for water, waste, natural resources, clean energy, transportation, and land use.[10]

- ✓ **Executive Order S-3-05** - On June 1, 2005, Governor Arnold Schwarzenegger signed EO S-3-05, which establishes GHG emissions reduction targets for California, and directs the California Environmental Protection Agency Secretary to coordinate the oversight of efforts to achieve them. The targets established by Governor Schwarzenegger call for a reduction of GHG emissions to 2000 levels by 2010; a reduction of GHG emissions to 1990 levels by 2020; and a reduction of GHG emissions to 80 percent below 1990 levels by 2050.

- ✓ **Executive Order B-16-2012** - EO B-16-2012 establishes long-term targets of reaching 1.5 million zero emission vehicles (ZEVs) on California's roadways by 2025 and sets ZEV purchasing requirements for State Government fleets. EO B-16-2012 also sets a target for 2050 of a reduction of GHG emissions from the transportation sector equaling 80 percent less than 1990 levels. In February 2013, an interagency working group developed the ZEV Action Plan, which identifies specific strategies and actions that State agencies will take to meet the milestones of the Executive Order. The ZEV Action Plan states:

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[9] California Air Resources Board. 13 July 2015. AB 32 Scoping Plan. Available at: http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

[10] California Air Resources Board. 27 May 2014. First Update to the AB 32 Scoping Plan. Available at: **http://www.arb.ca.gov/cc/scopingplan/document/updatedscopingplan2013.htm**

- ZEVs are crucial to achieving the state's 2050 greenhouse gas goal of 80 percent emission reductions below 1990 levels, as well as meeting federal air quality standards. Achieving 1.5 million ZEVs by 2025 is essential to advance the market and put the state on a path to meet these requirements.

✓ **Executive Order B-18-12** - Governor Edmund G. Brown, Jr. signed EO B-18-12 into law on April 25, 2012, which directs state agencies to reduce their grid-based energy purchases by at least 20 percent by 2018, as compared to a 2003 baseline. Pursuant to EO B-18-12, all new state buildings and major renovations beginning design after 2025 shall be constructed as Zero Net Energy facilities with an interim target for 50 percent of new facilities beginning design after 2020 to be Zero Net Energy. State agencies shall also take measures toward achieving Zero Net Energy for 50 percent of the square footage of existing state-owned building area by 2025. Further, the following measures relevant to energy are required:

- Any proposed new or major renovation of state buildings larger than 10,000 square feet shall use clean, on-site power generation, such as solar photovoltaic, solar thermal and wind power generation, and clean back-up power supplies, if economically feasible;
- New or major renovated state buildings and build-to-suit leases larger than 10,000 square feet shall obtain LEED "Silver" certification or higher, using the applicable version of LEED;
- New and existing buildings shall incorporate building commissioning to facilitate improved and efficient building operation; and
- State agencies shall identify and pursue opportunities to provide electric vehicle charging stations, and accommodate future charging infrastructure demand, at employee parking facilities in new and existing buildings.

✓ **Executive Order B-30-15** - EO B-30-15 reiterates EO S-3-05's 2050 GHG emissions target of 80 percent below 1990 levels and sets a new interim target of 40 percent below 1990 levels by 2030.

- CARB to update the Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent;
- CARB to update every three years the state's climate adaptation strategy;
- "State agencies shall take climate change into account in their planning and investment decisions and employ full life-cycle cost accounting to evaluate and compare infrastructure investments and alternatives."
- "State agencies' planning and investment shall be guided by the following principles:
  - Priority should be given to actions that both build climate preparedness and reduce greenhouse gas emissions;
  - Where possible, flexible, and adaptive approaches should be taken to prepare for uncertain climate impacts;
  - Actions should protect the state's most vulnerable populations; and
  - Natural infrastructure solutions should be prioritized."
- OPR to establish a technical advisory group to help state agencies incorporate climate change impacts into planning and investment decisions.

Environmental Setting

Energy Consumption and Conservation

The study area is comprised of highways, railways, bicycle trails, state routes, roads, and Caltrans rights-of-way. This analysis assumes that automobiles, trucks, transit buses, and other forms of transportation would continue to operate within the Merced region and use a variety of energy forms, including gasoline, compressed natural gas, diesel, and electricity. This section considers the supply and demand for both electricity and fossil fuels.

Energy is fundamental to the economy and the quality of life of the Merced County region. The primary energy source for the U.S. is petroleum (also referred to as "oil"), which is refined to produce fuels like gasoline, diesel, and jet fuel. Oil is a finite, nonrenewable energy source. World consumption of petroleum products has grown steadily since 1983; as of February 2022, world consumption of oil had reached 98.7 million barrels per day (IEA Oil Market Report). The world supply of oil is anticipated to peak (i.e., reach the point of maximum production) sometime between now and 2046, before beginning a terminal decline that will put a significant strain on the economy if not anticipated and mitigated. However, the timing of the peak depends on multiple, uncertain factors that will affect how quickly remaining oil is consumed, such as the amount of oil that still remains in the ground; how much of the amount in the ground can be extracted and produced based on technological, economic, and environmental feasibility; and future demand for oil.

The U.S., with approximately 4.5 percent of the world's population, accounts for nearly 21 percent of world oil consumption, roughly 17.2 million barrels per day (BP Statistical Review of World Energy, 2021), which is a decrease in consumption from 18.5 million barrels per day in 2015. U.S. oil production peaked around 1970 and declined every year until 2005 to about 8.3 million barrels per day. Since 2005, U.S. oil production has increased to 17.2 million barrels per day in 2020. The U.S. transportation sector is heavily dependent on oil and represented about 69 percent of U.S. petroleum consumption in 2019. Within the transportation sector, light vehicles (i.e., cars, light trucks [two-axle, four-tire trucks], and motorcycles) represent about 56 percent of the petroleum-based energy consumption in 2020.

California's transportation sector is equally dependent upon oil, with petroleum-based fuels currently providing nearly all (90 percent) of California's transportation energy needs (EIA, 2020). Furthermore, transportation-related activities represent almost half (48 percent) of California's petroleum-based fuel consumption. California refineries increasingly rely on imported petroleum products to meet this demand. In 2003 the CEC and ARB adopted a two-part strategy to reduce the state's petroleum demand: promoting improved vehicle efficiency and increasing the use of alternative fuels. In 2006, CEC and ARB set a goal that 20 percent of all transportation energy in 2020 comes from alternative fuels. State plans, programs, and regulations to implement this strategy are further discussed in the Regulatory Setting section below.

Similar to California and the U.S. as a whole, the Merced region relies primarily on oil to meet its transportation needs. Motor vehicles are the largest consumer of fuels in the region's transportation

sector. After gasoline, diesel fuel is the most utilized transportation energy source. The primary consumers of diesel fuel in the transportation sector are heavy-duty trucks, with medium-duty trucks, buses, light-duty passenger cars, and railway locomotives accounting for remaining diesel fuel consumption.

Alternative fuels are defined as fuels not derived from petroleum, such as natural gas, ethanol, and electricity. However, like petroleum, alternative fuels like natural gas and ethanol (which is primarily composed of diesel fuel) are also nonrenewable, finite resources. Electricity is also considered nonrenewable when generated from natural gas or coal, but considered renewable when generated from sources like solar, hydroelectric, or wind energy. Most alternative fuel facilities in the region supply compressed natural gas (CNG) or electricity. The region's limited alternative fuel infrastructure severely constrains the use of alternative fuel passenger vehicles.

Although average fuel efficiency for autos and trucks has experienced some improvements during the last quarter-century, fuel consumption associated with the large increase in VMT has exceeded the fuel consumption reductions achieved by improved efficiency, and the total amount of annual fuel consumption has continued to increase. The equipment and vehicles involved in the construction of transportation infrastructure (i.e., roadway and highway improvements; rail lines; etc.) also consume energy. Currently, construction equipment and vehicles are generally dependent on petroleum-based fuels.

Energy Conservation and Global Climate Change

The consumption of nonrenewable energy (primarily gasoline and diesel fuel) associated with construction activities and the operation of passenger, public transit, and commercial vehicles and future land use development results in GHG emissions that cause global climate change (also referred to herein as "climate change" and "global warming"). In addition, alternative fuels like natural gas (including CNG and liquid 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. An overview of climate change, the anticipated impacts of climate change to California, and the climate change impacts of the proposed 2022 RTP/SCS Amendment No. 1 are provided above. Impacts and mitigation measures associated with climate change also relate to the conservation of energy resources.

Environmental Impacts, Mitigation Measures, and Significance After Mitigation

Criteria for Significance

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

- ✓ Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.
- ✓ Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Impact EN 1 - Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation.

The proposed 2022 RTP/SCS Amendment No. 1 plans improvements to the region's transportation network and identified the location of future land use development consistent with local city and county general plans through the year 2046. Since the transportation and land use development sectors account for a very large portion of the energy consumed in the Merced region, implementation of transportation network improvements and new development would affect the region's energy consumption through 2046. In addition, construction of these improvements would result in increased energy consumption due to the operation of construction equipment and vehicles during construction activities. Multiple factors beyond the control of MCAG and outside the scope of the proposed 2022 RTP/SCS Amendment No. 1 may influence future transportation- and future land use development-related energy consumption patterns under the proposed 2022 RTP/SCS Amendment No. 1. These factors include, but are not limited to, state and federal regulatory actions; local land use decisions; technological improvements; regional economic conditions; the fuel-efficiency and fuel-source of private automobiles; the price of oil, gasoline, diesel, electricity, and other fuels; the source of region's electric power (i.e., proportion of renewable and nonrenewable sources); the amount of oil imported by the U.S. and others.

There are a few alternative fuel projects identified in the 2022 RTP/SCS Amendment No. 1 that would assist in minimizing Merced County's overall energy consumption. Vehicle fuel consumption was projected from a baseline year of 2019 through the RTP/SCS build out year of 2046 using the EMFAC 2014 model. Tables 47A (Amendment No. 1) and 47B (2022 RTP/SCS PEIR) quantify the projected vehicle fuel consumption in gallons per day using EMFAC data. Referencing Table 47A (Amendment No. 1), the total fuel consumption is projected to decrease from 484,400 gallons in 2019 to 412,400 gallons in 2046, representing a decrease of 15% percent over 27 years with the Project as it did in the 2022 RTP/SCS PEIR. The largest increase is projected in diesel fuel with a 5% percent increase over 27 years, while gasoline consumption is projected to decrease by 31% percent during the same time. It should be noted that the fuel consumption estimate is an overestimate, as "Pavely and Low Carbon Fuels" will have an impact on fleet efficiency.

TABLE 47A
Merced County Vehicle Fuel Consumption (2019 through 2046) - 2023

DIRECTION	2019	2035	2046
Gasoline (gal/day)	269,600	184,500	186,400
Diesel (gal/day)	214,800	219,300	226,000
Total Fuel (gal/day)	484,400	403,800	412,400
Total Fuel per capita (gal/day)	1.73	1.22	1.14

Source: MCAG, EMFAC 2014

TABLE 47B
Merced County Vehicle Fuel Consumption (2019 through 2046) - 2022

DIRECTION	2019	2035	2046
Gasoline (gal/day)	269,600	184,500	186,600
Diesel (gal/day)	214,800	219,300	226,000
Total Fuel (gal/day)	484,400	403,800	412,600
Total Fuel per capita (gal/day)	1.73	1.22	1.14

Source: MCAG, EMFAC 2014

The fuel consumption outputs reflect a decreasing trend of fuel consumption per capita. This analysis shows that with implementation of the various multi-modal improvements (bike/pedestrian facilities, transit infrastructure/service, etc.), considering future land use development under the 2022 RTP/SCS Amendment No. 1, VMT and fuel consumption will decrease.

Although energy consumption would increase under the proposed 2022 RTP/SCS Amendment No. 1, the transportation improvements are designed to the improve energy efficiency of the regional transportation system by increasing use of more fuel-efficient public transit, carpools, and vanpools, and improving circulation system levels of service. In addition, building codes have been prepared to reduce energy consumption by future land use development. See the Climate Change discussion above for a detailed discussion of RTP actions that promote GHG emissions reductions, energy conservation, energy efficiency and reduced fuel consumption.

Examples of transportation improvements included in the proposed 2022 RTP/SCS Amendment No. 1 that would improve energy efficiency include proposed transit improvements that would encourage optimized use of public transportation, and enhanced transit programs with new routes that would operate at higher speeds. Public transportation provides a more energy-efficient mode of travel than

single-passenger vehicles, thereby reducing the region's transportation energy consumption. Any reductions in traffic congestion realized through implementation of enhanced transit operations would also allow for more energy-efficient vehicular travel.

The SCS proposes an allocation of new land use development that would support new transportation facilities, including the densification of land uses along major transportation corridors. The intent is to reduce auto use and increase transit system use resulting in reduced energy resources.

The proposed 2022 RTP/SCS Amendment No. 1 would also involve highway and arterial widenings, and new freeway interchanges. This in turn would decrease travel time and congestion and consequently decrease fuel consumption from individual vehicles. As shown in Table 47A (Amendment No. 1) above, total fuel consumption in Merced County is expected to decrease when comparing the baseline year (2019) to the buildout year (2046) of the RTP/SCS.

The 2022 RTP/SCS Amendment No. 1 encourages the transport of goods by rail to reduce congestion on the freeway system. Hauling goods by rail has a positive energy impact. The Federal Railroad Administration estimates that intermodal rail is 2 to 4 times more fuel efficient than trucks. This indicates reduced energy efficiency of goods movement in the region and increased nonrenewable energy consumption.

The construction of transportation infrastructure and future land use development identified in the proposed 2022 RTP/SCS Amendment No. 1 would involve the use of construction equipment and vehicles, which are generally dependent upon nonrenewable petroleum-based fuels, on a large scale. However, it is not feasible to estimate energy consumption associated with future construction of the transportation projects and future land use development in the proposed 2022 RTP/SCS Amendment No. 1 at this program level of analysis.

Given the number of large-scale improvements programmed into the proposed 2022 RTP/SCS Amendment No. 1 and the amount of future land use development planned through to the year 2046, the increase in energy consumption associated with construction activities would be substantial. Although construction equipment and vehicles would be operated in accordance with all applicable rules and regulations, the substantial increase in energy consumption associated with the construction equipment and vehicles primarily powered by nonrenewable fuels under the proposed 2022 RTP/SCS Amendment No. 1 is considered a significant impact.

Operation of the transportation improvements and future land use development identified in the proposed 2022 RTP/SCS Amendment No. 1 would increase the total and per capita amount of diesel fuel consumption associated with the regional transportation network, as well as the increase in electricity and natural gas. Since diesel and natural gas resources are nonrenewable, the increase in such energy consumption under the proposed 2022 RTP/SCS Amendment No. 1 is considered a significant impact.

In addition to increased energy consumption directly associated with transportation activities, energy consumption would also increase as a result of new lighting including, but not limited to, lighting for

land use developments, streets stops or stations, transit station parking structures, and rail tunnels; traffic signals; electronic signage; and other ancillary electric, natural gas, or other energy-consuming components of transportation improvements and new development that would be implemented under the proposed 2022 RTP/SCS Amendment No. 1. Increased energy consumption levels associated with these ancillary project and land use development features are considered a significant impact.

The proposed 2022 RTP/SCS Amendment No. 1 includes goals and policies supporting smart growth through financial incentives, housing and mixed-use projects at existing and planned transit stations, support for local efforts to develop pedestrian master plans, and other activities that tend to reduce GHG emissions. However, since MCAG has no direct authority over land use planning and other local decisions, the extent to which the goals and policies supporting smart growth would be implemented by local jurisdictions is unknown.

Mitigation Measures

The specific impacts on energy consumption and energy conservation 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 MCAG does not have land use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below.

- ✓ **EN 1** Implementing agencies shall review energy impacts as part of any CEQA-required project-level environmental analysis and specify appropriate mitigation measures for any identified energy impacts.

- ✓ **EN 2** During the design and approval of transportation improvements and future land use development projects, the following energy efficiency measures shall be incorporated when applicable:

  - The design or purchase of any lighting fixtures shall achieve energy reductions beyond an estimated baseline energy use for such lighting.
  - LED technology shall be used for all new or replaced traffic lights, rail signals, and other new development lighting features compatible with LED technology.

- ✓ **EN 3** Implementing agencies should consider various best practices and technological improvements that can reduce the consumption of fossil fuels such as:

  - Expanding light-duty vehicle retirement programs.
  - Increasing commercial vehicle fleet modernization.
  - Implementing driver training modules on fuel consumption.
  - Replacing gasoline powered mowers with electric mowers.

- Reducing idling from construction equipment.
- Incentivizing alternative fuel vehicles and equipment
- Developing infrastructure for alternative fueled vehicles.
- Implementing truck idling rules, devices, and truck-stop electrification
- Requiring electric truck refrigerator units.
- Reducing locomotives fuel use.
- Modernizing older off-road engines and equipment.
- Encouraging freight mode shift.
- Limit use and develop fleet rules for construction equipment.
- Requiring zero-emission forklifts.

✓ **EN 4** Implementing agencies should include energy analyses in environmental documentation and general plans with the goal of conserving energy through the wise and efficient use of energy. For any identified energy impacts, appropriate mitigation measures should be developed and monitored. MCAG recommends the use of Appendix F, Energy Conservation, of the *CEQA Guidelines*.

✓ **EN 5** Project and land use development implementing agencies should streamline permitting and provide public information to facilitate accelerated construction of solar and wind power.

✓ **EN 6** Project and land use development implementing agencies should adopt a "Green Building Program" to promote green building standards. Green buildings can reduce local environmental impacts, regional air pollutant emissions and global greenhouse gas emissions. Green building standards involve everything from energy efficiency, usage of renewable resources and reduced waste generation and water usage. For example, water-related energy use in 2017 consumed 20 percent of the state's electricity. The residential sector accounts for 48 percent of both the electricity and natural gas consumption associated with urban water use. While interest in green buildings has been growing for some time, cost has been a main consideration as it may cost more up front to provide energy-efficient building components and systems. Initial costs can be a hurdle even when the installed systems will save money over the life of the building. Energy efficiency measures can reduce initial costs, for example, by reducing the need for over-sized air conditioners to keep buildings comfortable. Undertaking a more comprehensive design approach to building sustainability can also save initial costs through reuse of building materials and other means.

✓ **EN 7** Where identified, local governments should alter zoning to improve jobs/housing balance, create communities where people live closer to work, and bike, walk, and take transit as a substitute for personal auto travel consistent and in support of the SCS. Creating walkable, transit-oriented modes would generally reduce energy use and greenhouse gas emissions. Residential energy use (electricity and natural gas) accounts for less than 10 percent of California's greenhouse gas emissions. Furthermore, studies have shown that the type of housing (such as multi-family) and the size of a house have strong relationships to residential energy use. Residents of single-family detached housing consume over 20 percent more primary energy than those of multifamily housing and 9 percent more than those of single-family attached housing.

- ✓ **EN 8** Project and land use development implementing agencies should increase the number of AFVs (i.e., vehicles not powered strictly by gasoline or diesel fuel) both in publicly owned vehicles, as well as those owned by franchisees of these agencies, such as trash haulers, green waste haulers, street sweepers, and curbside recyclable haulers.

- ✓ **EN 9** Bid solicitations for construction of projects should preference the use of alternative formulations of cement and asphalt with reduced GHG emissions to the extent that such cement and asphalt formulations are available at a reasonable cost in the marketplace. Solicitations should also preference the recycling of construction waste and debris if market conditions permit.

- ✓ **EN 10** All mitigation measures listed in the Climate Change section are incorporated by reference and shall be implemented by implementing agencies to address energy conservation impacts.

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 impacts on energy and energy resources, 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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Impact EN 2 - Conflict with or obstruct a state or local plan for renewable energy or energy efficiency.

Energy consumption from new projects that do not include residential uses, such as the proposed Project, are primarily controlled by Title 24, Part 11 California Green Building Standards Code (CalGreen). Because of the limited nature of construction in terms of both duration and extent, as well as the fact that construction would be typical for infrastructure projects and no excess energy would be consumed, construction impacts would not be in conflict with any plan regarding energy efficiency. Operational energy use would be minimal due to the fact that Projects that would be undertaken under the RTP/SCS would generally not only not consume energy (roads) but would represent energy savings due to increased transit. In addition, projects undertaken during the RTP/SCS timeframe would themselves be subject to energy impacts analysis. Impacts of the proposed project would therefore be less than significant.

Mitigation Measures

- ✓ See Mitigation Measures EN 1 through EN 10 above for Impact EN 1.

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 impacts on energy and energy resources, 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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Findings

Comparing the results of the tables above reflective of the proposed Amendment No. 1 compared to the analysis contained in the 2022 RTP/SCS PEIR, changes are minimal and insignificant. As such, the analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No. 1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant energy impacts or a substantial increase in the severity of energy resource impacts beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.7 Geology, Soils and Mineral Resources

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to geology and soils beyond those already identified in the 2022 RTP/ SCS PEIR. The 2022 RTP/SCS PEIR identified that damage to transportation infrastructure can result from geologic and seismic activity, such as surface rupture, ground shaking, subsidence, liquefaction, soil expansion and land-sliding. In addition, work associated with implementation of the 2022 RTP/SCS could cause impacts such as soil erosion, ground instability and loss of mineral resources. However, incorporation of mitigation measures identified in the 2022 RTP/SCS PEIR would alleviate significant impacts associated with geological safety and mineral loss (reference 2022 RTP/SCS PEIR, pages 3-250 through 3-278). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. Thus, the incorporation of the proposed changes to the Project List would not result in any new significant impacts to geology, soils and mineral resources, or a substantial increase in the severity of impacts to geology, soils, and mineral resources beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.9 Hazardous Materials

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to hazardous materials beyond those already identified in the 2022 RTP/SCS PEIR. The 2022 RTP/SCS PEIR concluded that there would be potential hazards created due to the disturbance of contaminated property during implementation of the 2022 RTP/SCS and risk of accidental releases due to an increase in the transportation of hazardous materials and the potential for such releases to reach schools within one-quarter mile of transportation facilities affected by the 2022 RTP/SCS (reference the 2022 RTP/SCS PEIR, pages 3-279 through 3-305). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant impacts to hazardous materials, or a substantial increase in the severity of impacts to hazardous materials beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.10 Hydrology and Water Quality

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to hydrology and water quality beyond those already identified in the 2022 RTP/SCS PEIR. The 2022 RTP/SCS would result in significant impacts to water quality standards and waste discharge requirements, groundwater supplies or interfere substantially with groundwater recharge, existing drainage patterns of the area, existing drainage patterns of the area, runoff water that would exceed the capacity of existing or planned stormwater drainage systems or providing substantial additional sources of polluted runoff but will have no impact on placing housing within a 100-year flood hazard area (reference the 2022 RTP/SCS PEIR, pages 3-306 through 3-347). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/ SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant impacts to hydrology and water quality, or a substantial increase in the severity of impacts to hydrology and water quality beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.11 Land Use and Planning

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to land use and planning beyond those already identified in the 2022 RTP/SCS PEIR. The 2022 RTP/SCS PEIR analyzed potential impacts of the 2022 RTP/SCS on land use and planning consistency and compatibility. The 2022 RTP/SCS PEIR concluded that implementation of major transportation projects and land use strategies included in the 2022 RTP/SCS has the potential to conflict with

applicable land use plans, policies and regulations, physically divide established communities as result of creating real or perceived barriers to pedestrians, bicyclists and motorists and conflict with habitat conservation plans and natural community conservation plans (reference the 2022 RTP/SCS PEIR, pages 3-348 through 3-370). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/ SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant impacts to land use and planning, or a substantial increase in the severity of impacts to land use and planning beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.12 Noise

This section provides information about the effects of noise from the Project (2022 RTP/SCS Amendment No. 1). The methodology and the criteria used to evaluate the significance of noise-related impacts as well as mitigation measures are discussed.

There were no changes to the analysis results considering Amendment No. 1 compared to the certified 2022 RTP/SCS PEIR. The 2022 RTP/SCS PEIR section related to Noise can be found on Pages 3-371 through 3-391 of the Draft PEIR.

Regulatory Setting

In general, the federal government sets noise standards for transportation noise sources that are related to interstate commerce. These typically include aircraft, trains, and trucks. State governments establish noise standards for those sources not regulated by federal standards such as automobiles, light trucks, motorboats and motorcycles. Other noise sources associated with construction, as well as industrial, and commercial activities are usually regulated by noise ordinances and general plan policies, which are established by local jurisdictions.

Federal Regulations

The Federal Highway Administration (FHWA) has established noise abatement criteria that must be considered for the design of federal or federally funded highway projects. Federal regulations also set noise limits for medium and heavy trucks (over 4.5 gross tons). The federal standard for truck pass by noise at 15 meters (50 feet) is 80 dB from the vehicle pathway centerline. These standards are implemented through federal regulatory controls on truck manufacturers. Noise generated from aircraft operated in the United States is also subject to federal regulation, which is established by the Federal Aviation Administration (FAA). Aircraft manufacturers must comply with these regulations prior to certification of the aircraft. Similarly, locomotives are also subject to federal standards.

Title 23, Part 772 of the Code of Federal Regulations (23 CFR 772) provides procedures for conducting highway project noise studies and implementing noise abatement measures to help protect the public health and welfare, supply Noise Abatement Criteria (NAC), and establish requirements for

information to be given to local officials for use in planning and designing highways. Under this regulation, noise abatement must be considered for a Type I project if the project is predicted to result in a traffic noise impact. A traffic noise impact is considered to occur when the project results in a substantial noise increase or when the predicted noise levels approach or exceed the NAC specified in the regulation.

Title 23, Part 772 of the Code of Federal Regulations does not specifically define what constitutes a substantial increase or the term approach; rather, it leaves interpretation of these terms to the states. In California, a noise level is considered to approach the NAC for a given activity category if it is within 1 dBA of the NAC. A substantial noise increase is considered to occur when the project's predicted worst-hour design-year noise level exceeds the existing worst-hour noise level exceeds the existing worst-hour noise level by 12 dBA or more. Before adoption of a final environmental document, Caltrans shall identify noise abatement measures that are feasible and reasonable as well as noise impacts for which no apparent solution is available. Noise abatement measures that are feasible and reasonable are then incorporated into the project's plans and specifications to reduce or eliminate the noise impact on existing activities, developed lands, or undeveloped lands for which development is planned, designed, and programmed. Table 48 summarizes the NAC.

- ✓ **Department of Housing and Urban Development (HUD)** - HUD seeks to create quality affordable housing for all Americans and uses their platform to improve the quality of life. To achieve their goals and fulfill their mission, HUD has established its own exterior noise criteria for evaluating projects located in high noise areas (e.g., near an airport, road, or railroad).

  HUD's exterior noise criterion states that 65 dBA DNL noise levels or less are satisfactory for residential land uses. HUD's criterion does not include standards for interior noise levels, but it is assumed that current construction/building code will provide sufficient attenuation such that, if the exterior noise level is 65 dBA DNL or less, the interior level will be 45 dBA DNL or less.

- ✓ **Federal Aviation Administration (FAA)** - Aircraft operated in the U.S. are subject to certain federal requirements regarding noise emissions levels. These requirements are set forth in Title 14 CFR, Part 36. Part 36 establishes maximum acceptable noise levels for specific aircraft types, considering the model year, aircraft weight, and number of engines. Pursuant to the federal Airport Noise and Capacity Act of 1990, the FAA established a schedule for complete transition to Part 36 "Stage 3" standards by year 2000. This transition schedule applies to jet aircraft with a maximum takeoff weight in excess of 75,000 pounds, and thus applies to passenger and cargo airlines, but not to operators of business jets or other general aviation aircraft.

- ✓ **Title 14, Part 150 of the CFR (14 CFR 150)** promotes the creation of noise exposure maps by airports that show land uses incompatible with high noise levels. The Part 150 Program formulates voluntary participating that airports may utilize to conduct airport noise compatibility planning, to measure airport noise impacts, and identify incompatible land uses. It remains the responsibility of local authorities for determining the acceptable and permissible land uses and the relationship with specific noise contours.

- ✓ Although the **National Environmental Policy Act (NEPA)** does not establish specific noise standards, the noise impacts of projects are routinely considered as one of the potential environmental consequences of federal actions subject to NEPA.

- ✓ **Federal Highway Administration (FHWA)** - The Federal Highway Administration (FHWA) uses a one-hour equivalent (time-average) sound level criteria of 67 dBA to determine when to consider noise barriers for new highway projects. Before actually building barriers, the FHWA requires that the project further qualify based on the cost and benefit of the barrier per protected home.

TABLE 48
Noise Abatement Criteria

Activity Category	Activity $L_{eq}[h]$[1]	Evaluation Location	Description of Activities
A	57	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an importatnt public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[2]	67	Exterior	Residential.
C[2]	67	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meetings rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meetings rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[2]	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F			Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G			Undeveloped lands that are not permitted.

1 The Leq[h] activity criteria values are for impact determination only and are not design standards for noise abatement measures. All values are A-weighted decibles (dBA).

2 Includes undeveloped lands permitted for this activity category.

Source: FHWA 23 CFR 772

- ✓ **Federal Railroad Administration (FRA)** - The FRA, established by the Department of Transportation Act of 1966, was created to advance and enforce rail safety regulations, manage railroad assistance programs, coordinate research and development of the continuous improvement of railroad safety and national rail policy, and to unite government support of tail transportation. Noise standards for the FRA are the same as those specified by the FTA.

- ✓ **Federal Transit Administration (FTA)** - The FTA, established by the Urban Mass Transportation Act of 1964, was tasked with providing federal assistance for mass transit projects. Its procedures to evaluate noise resulting from transit projects are outline in the document titled, "Transit Noise Vibration Impact Assessment" (FTA, 2006). The three (3) categories of noise-sensitive land uses are the following:

  - ➢ Category 1: buildings or parks where quiet is an essential element of their purpose:
  - ➢ Category 2: residences and buildings where people normally sleep. This includes residences, hospitals, and hotels where nighttime sensitivity is assumed to be of utmost importance.
  - ➢ Category 3: institutional land uses with primarily daytime and evening use. This category includes schools, libraries, churches, and active parks.

- ✓ **Federal Vibration Policies** - The FHWA is responsible for noise standards associated with federally funded highway projects and for establishing procedures to evaluate these noise impacts to determine whether the impacts warrant noise abatement actions. The noise abatement criteria are based on worst hourly Leq sound levels. The Federal Railway Administration (FRA) and the Federal Transit Administration (FTA) have published guidance relative to vibration impacts. The FRA establishes noise standards for federally funded transit projects and the FTA establishes noise standards for federally funded rail projects. According to the FRA, fragile buildings can be exposed to groundborne vibration levels of 0.5 PPV without experiencing structural damage. The FTA has identified the human annoyance response to vibration levels as 80 VdB.

- ✓ **U.S. Environmental Protection Agency (US EPA)** - Established in 1969 (42 U.S. Code § 4321-4347), the U.S. EPA outlines indoor and outdoor noise limits to serve the overall public health and welfare. The Noise Pollution and Abatement Act of 1972 established a federal program for regulating noise pollution that could endanger the public health. The U.S. EPA was given the responsibility of over-seeing federal research and activities related to noise control as well as coordinating its programs with other federal agencies. The program lost its funding in 1981 and the regulation of noise pollution and standards has mainly become the responsibility of State and local agencies. However, the U.S. EPA is still responsible for coordinating the programs of all federal agencies and dealing with noise standards related to commerce.

State Regulations

The State sets standards for light trucks (less than 4.5 gross tons), passenger cars, and other motor vehicles as identified in the California Motor Vehicle Code. The State of California has also established additional noise standards to regulate freeway noise affecting schools and classrooms. Furthermore, the State has adopted noise insulation standards for multi-family residential units, hotels, and motels that are in areas subject to high levels of transportation-related noise.

- ✓ **California's Airport Noise Standards** - The State of California has the authority to establish regulations requiring airports to address aircraft noise impacts on land uses in their vicinities. The State of California's Airport Noise Standards, found in Title 21 of the California Code of

Regulations, identify a noise exposure level of CNEL 65 dB as the noise impact boundary around airports. Within the noise impact boundary, airport proprietors are required to ensure that all land uses are compatible with the aircraft noise environment, or the airport proprietor must secure a variance from the California Department of Transportation.

- ✓ **California Department of Transportation (Caltrans)** - The State of California establishes noise limits for vehicles licensed to operate on public roads. For heavy trucks, the State passby standard is consistent with the federal limit of 80 dB. The State passby standard for light trucks and passenger cars (less than 4.5 tons gross vehicle rating) is also 80 dB at 15 meters from the centerline. For new roadway projects, Caltrans employs the Noise Abatement Criteria, discussed above in connection with FHWA. Caltrans provides agencies that fund construction or reconstruction projects with policies, procedures, and practices. Noise abatement criteria outlined in Caltrans' Traffic Noise Analysis Protocol is the same as those specified in 23 Code of Federal Regulations Section 772.

- ✓ **California Noise Insulation Standards** - The California Noise Insulation Standards found in the California Code of Regulations, Title 24, set requirements for new multi-family residential units, hotels, and motels that may be subject to relatively high levels of transportation-related noise. For exterior noise, the noise insulation standard is DNL 45 dB in any habitable room and requires an acoustical analysis demonstrating how dwelling units have been designed to meet this interior standard where such units are proposed in areas subject to noise levels greater than DNL 60 dB.

- ✓ **High Speed Rail** – Operations for the future High-Speed Rail project within the Merced County are expected to increase railroad noise levels at locations in proximity to High-Speed Rail tracks. Figure 7 of the California High-Speed Train Project EIR/EIS for the Merced to Fresno Region section indicates train noise may exceed 60 dB Ldn, Normally Acceptable noise levels, for new residential uses at locations exceeding one thousand (1,000) feet from the tracks.

- ✓ **Governor's Office of Planning and Research (OPR)** - The OPR is obligated to adopt and periodically revise the guidelines utilized to prepare the content of local general plans. The 2003 OPR General Plan Guidelines established noise/land use compatibility guidelines indicating Normally Acceptable noise levels for noise-sensitive land uses of up to 60 dBA CNEL, Conditionally Acceptable from 60 to 70/75 dBA CNEL, and Normally Acceptable above 70 or 75 dBA CNEL.

- ✓ **State of California General Plan Guidelines** - The State of California General Plan Guidelines include recommended guidelines for noise elements of city and county general plans, and compliance is not required. However, many local agencies do base their noise elements on these guidelines which vary by land use type and are helpful when determining land use compatibility.

- ✓ **State Vibration Policies** - There are no adopted state policies or standards for ground-borne vibration. However, Caltrans recommends that extreme care be taken when sustained pile driving occurs within 7.5 meters (25 feet) of any building, and 15 to 30 meters (50 to 100 feet) of a historic building or a building in poor condition.

Local Regulations

The noise element and local noise ordinances are the two primary documents that local jurisdictions use to set noise standards in their community. A noise element is a required component of each jurisdiction's General Plan. The noise element is required to analyze the current and future noise levels associated with local noise sources, such as freeways and highways, major streets and arterials, rail operations, aviation activities and local industrial plants and develop noise contours for these sources using CNEL or Ldn.

The noise element also includes implementation measures and possible solutions for existing and potential noise problems. The noise elements of the cities and the County typically apply land use compatibility criteria of 60-65 dB Ldn as being normally acceptable for new residential developments affected by transportation noise sources. The intent of these standards is to provide an acceptable noise environment for outdoor activities. In addition, an interior noise level criterion of 45 dB Ldn is commonly applied to residential land uses. The intent of this standard is to provide a suitable environment for indoor communication and sleep. These criteria are consistent with the interior and exterior noise level standards applied by the Federal Department of Housing and Urban Development (HUD).

The above-described noise standards are commonly applied to new residential projects affected by transportation noise sources, rather than the increase in traffic noise levels resulting from regional growth, such as in this study. Nonetheless, the local noise criteria are included to provide a frame of reference by which the magnitude of existing and future traffic noise levels can be compared.

- ✓ **Merced County General Plan Health and Safety Element** - The Health and Safety Element of the Merced County 2030 General Plan provides a basis for comprehensive local policies to control and abate environmental noise, and to protect the citizens of Merced County from excessive noise exposure. Merced County desires to protect residents, employees, and visitors from the harmful and annoying effects of exposure to excessive noise.

  The Health and Safety Element contains specific policies and establishes noise level limits for both transportation and non-transportation noise sources. Specifically, exterior and interior noise environments of 65 dB Ldn and 45 dB Ldn are considered acceptable for residential land uses affected by transportation noise sources (traffic, railroad, and aircraft). In addition, the current Noise Element establishes exterior noise level limits of 55 and 50 dB median (L50), and 75 and 70 dB Noise Lmax, during daytime and nighttime hours, respectively, at residential uses affected by other (non-transportation) sources of noise. For hospitals and schools, an exterior noise environment of 65 dB is considered acceptable.

- ✓ **Merced County Noise Ordinance** - In the Merced County Code, chapter 10.60 contains the Noise Ordinance that sets sound level limits for residential and nonresidential properties. It establishes that background noise levels are not permitted to exceed 10dBA during daytime hours, or 5 dBA during nighttime hours. It specifies maximum noise levels should not exceed 75 dBA Lmax in

residential areas or 80 dBA Lmax in nonresidential areas. This code also sets exterior noise level limits of 65 dBA Ldn in residential areas and 70 dBA Ldn in nonresidential areas.

Major Noise Sources in Merced County

Noise sources are commonly grouped into two major categories: transportation and non-transportation noise sources. Transportation noise sources include surface traffic on public roadways, railroad line operations, and aircraft in flight. Non-transportation (or fixed), noise sources, commonly consist of industrial activities, railroad yard activities, small mechanical devices (lawnmowers, leaf blowers, air conditioners, radios, etc.), and other sources not included in the traffic, railroad and aircraft category.

✓ **Traffic Noise**

The ambient noise environment in Merced County is defined by a wide variety of noise sources. The most pervasive source of noise in the region is traffic noise. With thousands of miles of roadways in the County, it is difficult to escape the sound of traffic. Traffic noise exposure is mainly a function of the number of vehicles on a given roadway per day, the speed of those vehicles, the percentage of medium and heavy trucks in the traffic volume, and the receiver's proximity to the roadway. Every vehicle passage on every roadway in the region radiates noise.

Existing high noise levels along major streets and highways are generally caused by traffic and congestion. Potential impacts along these facilities are generally classified as follows:

- Low - Ldn 59 dB or below
- Moderate - Ldn 60 dB to 65 dB
- High - Ldn 66 dB or greater

The potential for adverse noise impacts is generally moderate to high along most segments of State highways and is generally low to moderate along most segments of County streets and highways.

✓ **Rail Noise**

The region is also affected by freight and passenger railroad operations. While these operations generate significant noise levels in the immediate vicinity of the railroad tracks during train passages, these operations are intermittent, and the tracks are widely dispersed throughout the region. For these reasons, the contribution of railroad noise to the overall ambient noise environment in the County is relatively small.

The two main railroad line operations in Merced County are the Union Pacific Transportation Company (UP) and the Burlington, Northern and Santa Fe (BNSF). Numerous freight train operations per day occur on the UP and BNSF lines that extend from their respective yards to points north and south of the County. There are approximately 14 daily train movements along

the UP line in Merced County and approximately 34 daily train movements along the BNSF line plus 12 daily passenger rail operations.

High noise impacts can be expected within approximately 100 feet of railroad tracks, moderate impacts from 100-700 feet, and low impacts at distances greater than about 700 feet. The above-noted impacts may be lesser or greater depending on site-specific factors such as soundwalls, grade crossings and topographic shielding. Insignificant noise impacts can be expected adjacent to the several branch lines in Merced County.

- ✓ **Airport Noise**

Merced County is home to public and private airports. In addition to the numerous daily aircraft operations, which originate and terminate at these airports daily, over flights of the area by aircraft not utilizing the regional airports frequently occur. All of these operations contribute in some degree to the overall ambient noise environment in the County. The intensity of aircraft noise exposure depends on one's proximity to the aircraft flight path, the type, speed, and altitude of airplane, as well as atmospheric conditions. The farther away the noise source is, the more the sound propagation from source to receiver is affected by weather.

There are five (5) public use airport facilities in Merced County. These include the Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport. Airport noise contours have been established for all airport facilities in the County and are consistent with the Federal Aviation Administration (FAA) Integrated Noise Model. In addition, noise contours for existing and future conditions at each of the airports are contained in plans or studies, including Airport Master Plans, Airport Land Use Compatibility Plan, Comprehensive Airport Land Use Plans, Airspace Plans, and Airport Layout Plans, which are all incorporated by reference. Each of these plans or studies includes implementation goals, objectives, and policies and/or recommendations to lessen noise impacts.

- ✓ **Land Use Development Noise Sources**

There are a wide variety of industrial and other non-transportation noise sources in the County, including heavy industrial or manufacturing operations, power plants, food packaging and processing facilities, lumber mills, aggregate mining and processing plants, racetracks, shooting ranges, amphitheaters, and car washes, to name a few. Noise generated by these sources varies significantly but can provide a greater contribution to the local ambient noise environment than traffic, depending on the nature of the noise source. Although non-transportation noise sources can define the ambient noise environment within a given distance to the noise source, the regional ambient noise environment is, nonetheless, defined primarily by traffic.

Environmental Setting

Noise is often described as unwanted sound, and thus is a subjective reaction to characteristics of a physical phenomenon. Researchers have generally agreed that A-weighted sound pressure levels

(sound levels) are well correlated with subjective reaction to noise. Variations in sound levels over time are represented by statistical descriptors, and by time-weighted composite noise metrics such as the Day/Night Average Level (Ldn). The unit of sound level measurement is the decibel (dB), sometimes expressed as dBA. Throughout this analysis, A-weighted sound pressure levels will be used to describe traffic and other noise sources. Typical indoor and outdoor noise levels are presented in Figure 5 (Common Environmental Sound Levels).

The following noise descriptors are used throughout section:

- ✓ Day-Night Average Noise Level (Ldn). Ldn is the average equivalent sound level during a 24-hour day, obtained after addition often decibels to sound levels in the night after 10:00 p.m. and before 7:00 a.m.
- ✓ Energy-Equivalent Noise Level (Leq). Leq is the sound level containing the same total energy as a time varying signal over a given sample period. Leq is typically computed over 1, 8 and 24-hour sample periods.
- ✓ Community Noise Equivalent Level (CNEL). CNEL is the average equivalent sound level during a 24-hour day, obtained after addition of approximately five decibels to sound levels in the evening from 7 p.m. to 10p.m. and ten decibels to sound levels in the night before 7 a.m. and after 10 p.m.
- ✓ Decibel (dBA). A unit for describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micro-newtons per square meter).

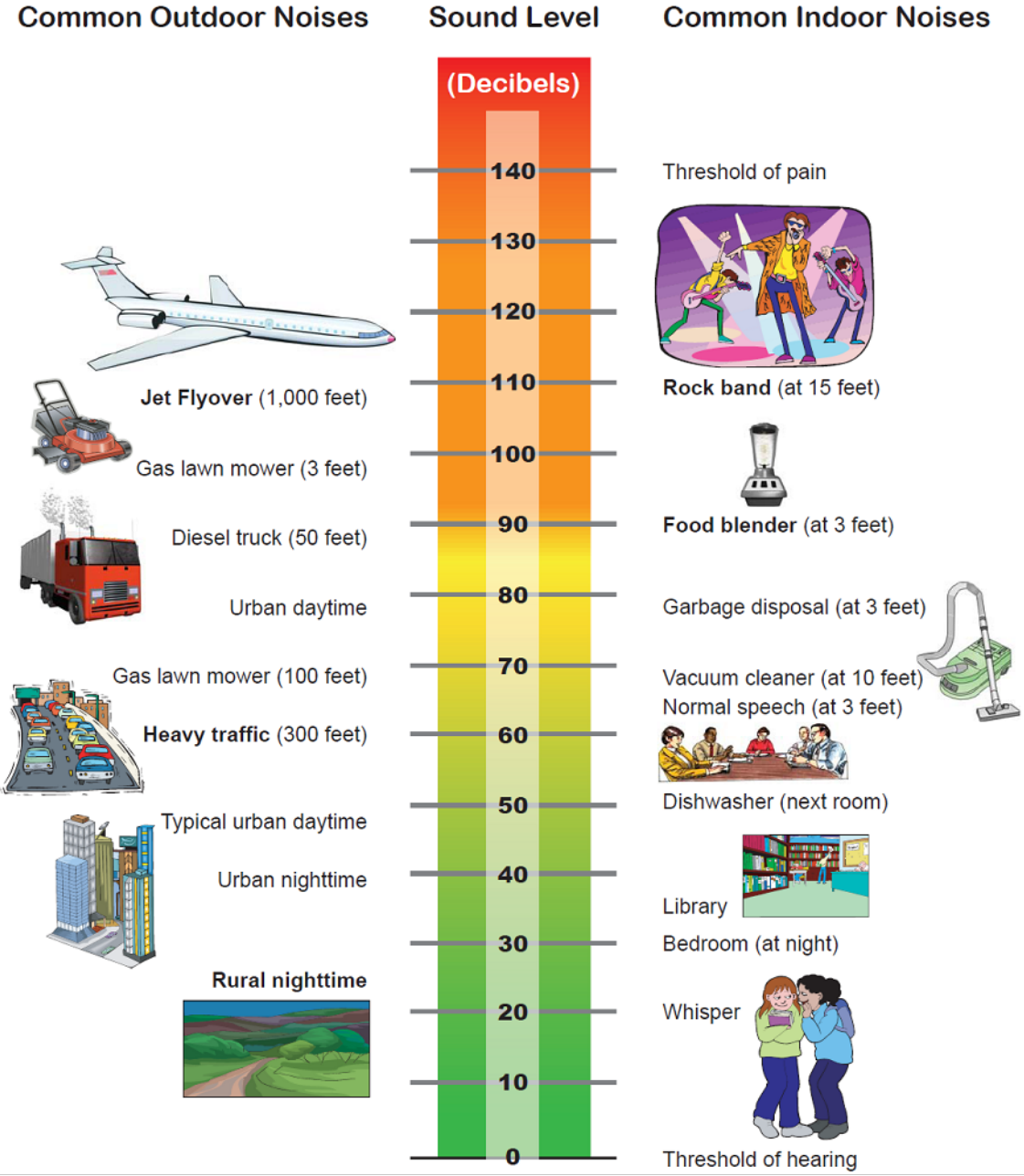
Sound is defined as any pressure variation in air that the human ear can detect. If the pressure variations occur frequently enough (at least 20 times per second), they can be heard, and hence, are called sound. The number of pressure variations per second is called the frequency of sound, and is expressed as cycles per second, called hertz (Hz) by international agreement. The speed of sound in air is approximately 770 miles per hour, or 1,130 feet/second. Knowing the speed and frequency of a sound, one may calculate its wavelength; the physical distance in air from one compression of the atmosphere to the next.

An understanding of wavelength is useful in evaluating the effectiveness of physical noise control devices such as mufflers and barriers, which depend upon either absorbing or blocking sound waves to reduce sound levels. Measuring sound directly in terms of pressure would require a very large and awkward range of numbers. To avoid this, the decibel scale was devised. The decibel scale uses the hearing threshold of 20 micropascals as a point of reference, defined as 0 dB. Other sound pressures are then compared to the reference pressure, and the logarithm is taken to keep the numbers in a practical range.

The decibel scale allows a million-fold increase in pressure to be expressed as 120 dB. Another useful aspect of the decibel scale is that changes in levels (dB) correspond closely to human perception of relative loudness. The perceived loudness of sounds is dependent upon many factors, including sound pressure level and frequency content. However, within the usual range of environmental noise levels, perception of loudness is relatively predictable, and can be approximated by weighting the frequency

response of a sound level measurement device (called a sound level meter) by means of the standardized A-weighting network.

FIGURE 5
Common Environmental Sound Levels



There is a strong correlation between A-weighted sound levels (expressed as sound levels in dB) and community response to noise. For this reason, the A-weighted sound pressure level has become the standard tool of environmental noise assessment.

Community noise is commonly described in terms of the "ambient" noise level, which is defined as the all-encompassing noise level associated with a given noise environment.

A common statistical tool to measure the ambient noise level is the average, or equivalent, sound level (Leq), which corresponds to a steady-state sound level containing the same total energy as a time-varying signal over a given time period (usually one hour). The Leq is the foundation of the composite noise descriptors such as Ldn and shows very good correlation with community response to noise.

The CNEL, like Ldn, is based upon the weighted average hourly Leq over a 24-hour day, except that an additional +4.8 decibel penalty is applied to evening (7:00 p.m. to 10:00 p.m.) hourly Leq values. The CNEL was developed for the California Airport Noise Regulations and is applied specifically to airport/aircraft noise assessment. For this reason, the Ldn descriptor, rather than CNEL, is used for the assessment of traffic noise levels in the County.

Noise in the community has often been cited as being a health problem, not in terms of actual damage such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities such as sleep, speech, recreation, and tasks demanding concentration or coordination. When community noise interferes with human activities or contributes to stress, public annoyance with the noise source increases, and the acceptability of the environment for people decreases. This decrease in acceptability and the threat to public well-being are the bases for land use planning policies preventing exposure to excessive community noise levels.

To control noise from fixed sources, which have developed from processes other than zoning or land use planning, many jurisdictions have adopted community noise control ordinances. Such ordinances are intended to abate noise nuisances and to control noise from existing sources. They may also be used as performance standards to judge the creation of a potential nuisance, or potential encroachment of sensitive uses upon noise-producing facilities. Community noise control ordinances are generally designed to resolve noise problems on a short-term basis (usually by means of hourly noise level criteria), rather than on the basis of 24-hour or annual cumulative noise exposures.

Noise ordinance criteria are not applicable to traffic on public roadways. However, General Plan Noise Elements provide noise standards for new noise-sensitive land uses affected by transportation noise sources. General Plan Noise Elements frequently contain general noise mitigation measures for use in reducing the potential for adverse noise impacts associated with the development of new noise-sensitive or noise-producing land uses.

For new noise-sensitive land uses affected by transportation noise sources, many jurisdictions consider land use compatibility criteria of 60 to 65 dB Ldn as being “normally acceptable” for such uses. Typical options for mitigation of excessive traffic noise levels include the use of setbacks or buffer areas between the roadways and the proposed noise-sensitive land use, noise barriers, residential unit design and improvements to building facade construction. Because many rural residential areas experience very low noise levels, residents may express concern about the loss of

"peace and quiet" due to the introduction of a sound, which was not audible previously. In very quiet environments, the introduction of virtually any change in local activities will cause an increase in noise levels. A change in noise level and the loss of "peace and quiet" is the inevitable result of land use or activity changes in such areas. Audibility of a new noise source or increases in noise levels within recognized acceptable limits are not usually considered to be significant noise impacts, but these concerns should be addressed and considered in the planning and environmental review processes.

Vibration Characteristics and Effects

Groundborne vibration is the oscillatory motion of the ground above some equilibrium condition that could be described in terms of displacement, velocity, or acceleration. Because sensitivity to vibration typically corresponds to the amplitude of vibrating velocity within the low-frequency range (e.g., 5 to 100 Hertz), velocity changes are the preferred measure for evaluating groundborne vibration.

The most common measure used to quantify vibration amplitude is the Peak Particle Velocity (PPV). PPV is typically used in monitoring blasting and other types of construction-generated vibration, since it is related to the stresses experienced by building components. Although PPV is appropriate for evaluating building damage, it is less suitable for evaluating human response, which is better related to the average vibration amplitude. Therefore, groundborne vibration from equipment (e.g., trains, subways, earthmovers, graders, and bull dozers) is usually characterized in terms of the smoothed root mean square (rms) vibration velocity level. This is expressed in velocity decibels (VdB). VdB values are expressed in inches per second. The VdB is used to avoid confusion with sound decibels.

Ambient vibration levels in residential areas are typically 50 VdB, which is well below human perception. The operation of heating/air conditioning systems and slamming of doors produce typical indoor vibrations that are noticeable to humans. The most common exterior sources of ground vibration that can be noticeable to humans inside residences include constructions activities, train operations, and street traffic.

Table 49 provides some common sources of ground vibration and the relationship to human perception. This information comes from the Federal Transit Administration's "Basic Ground-Bourne Vibration Concepts."

Despite the perceptibility threshold of about 65 VdB, human reaction to vibration is not significant unless the vibration exceeds 75 VdB according to the United States Department of Transportation.

California Department of Transportation's (Caltrans) Transportation and Construction-Induced Vibration Guidance Manual (2004) identifies thresholds for disturbance due to vibration: 0.2 inches per second for continuous vibration sources such as processing and excavation activities, and 0.9 inches per second for transient vibration sources such as blasting.

TABLE 49
Typical Levels of Ground-Borne Vibration

Human/Structural Response	Velocity Level, VdB	Typical Events (50 ft. Setback)
Threshold, minor cosmetic damage fragile buildings	100	Blasting from construction projects
		Bulldozers and other heavy tracked construction equiment
Difficulty with tasks such as reading a video or computer screen	90	
		Commuter rail, upper range
Residential annoyance, infrequent events (e.g commuter rail)	80	Rapid transit, upper range
		Commuter rail, typical
Residential annoyance, infrequent events (e.g rapid transit)		Bus or truck over bump
	70	Rapid transit, typical
Limit for vibration sensitive equipment. Approx. threshold for human perception of vibration		Bus or truck, typical
	60	
		Typical background vibration
	50	

Source: Federal Transit Administration

Noise Barriers

Shielding by barriers can be obtained by placing walls, berms or other structures between the traffic or other noise source and the receiver. The effectiveness of a barrier depends upon blocking line-of-sight between the traffic and receiver and is improved with increasing the distance the sound must travel to pass over the barrier as compared to a straight line from source to receiver. For a noise barrier to be effective, it must not only be sufficiently tall to intercept line of sight from noise source to receiver, but it must also be sufficiently long to reduce the potential for sound to flank around ends of the barrier. Barrier effectiveness depends upon the relative heights of the source, barrier and receiver. In general, barriers are most effective when placed close to either the receiver or the traffic or other noise source.

An intermediate barrier location yields a smaller path length difference for a given increase in barrier height than does a location closer to either source or receiver. For maximum effectiveness, barriers must be continuous and relatively airtight along their length and height. To ensure that sound transmission through the barrier is insignificant, barrier mass should be about 4 lbs. /square foot, although a lesser mass may be acceptable if the barrier material provides sufficient transmission loss in the frequency range of concern.

Satisfaction of the above criteria requires substantial and well-fitted barrier materials, placed to intercept line of sight to all significant traffic noise sources. Earth, in the form of berms or the face of a depressed area, is also an effective barrier material. There are practical limits to the noise reduction provided by barriers. For highway traffic noise, a 5 to 10 dB noise reduction may often be reasonably attained. A 15 dB noise reduction is sometimes possible, but a 20 dB noise reduction is extremely difficult to achieve. Barriers usually are provided in the form of walls, berms, or berm/wall combinations. The use of an earth berm in lieu of a solid wall will provide up to 3 dB additional attenuation over that attained by a solid wall alone, due to the absorption provided by the earth. Berm/wall combinations offer slightly better acoustical performance than solid walls and are often preferred for aesthetic reasons.

Noise barriers currently exist or are planned in many areas of the County adjacent to the state highways or existing development to shield noise. In cases of new residential development adjacent to a major roadway in the County, the responsibility for noise mitigation is placed on the individual improvement project developer. In such cases, noise barriers are commonly constructed just inside the highway right of way. In other cases, local jurisdictions and Caltrans have built barriers as part of roadway improvement projects or barrier retrofit programs.

Environmental Impacts, Mitigation Measures, and Significance After Mitigation

The impacts of the Project were analyzed considering implementation of the proposed 2022 RTP/SCS Amendment No. 1, including changes to the transportation network and land uses, may impact the noise environment. This noise analysis evaluates the noise impacts of the Project by comparing predicted traffic noise levels for the proposed Project to the 2019 Base Year model scenario provided by MCAG.

Criteria for Significance

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/SCS would result in a significant noise impact if it would result in:

- ✓ Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- ✓ Generation of excessive groundborne vibration or groundborne noise levels.
- ✓ For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

Generally, proposed projects are of the following two types:

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

Methodology

Since noise is a highly localized impact, specific and detailed analyses are most appropriate at the individual improvement project and new development project level. Subsequent project specific EIRs will be required to further analyze the transportation improvements or new development proposed by the Project to determine the magnitude of noise and vibration impacts, and to identify appropriate potential mitigations for each individual improvement or new land use development project.

Impact N 1 - Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Noise-sensitive land uses could be exposed to noise in excess of normally acceptable noise levels and/or could experience substantial increases in noise as a result of the operation of expanded or new transportation facilities (i.e., increased traffic resulting from new highways, addition of highway lanes, roadways, ramps, and new transit facilities as well as increased use of existing transit facilities, etc.) and future noise generating land use developments.

At the regional scale, the noise impacts of new highways, highway widening, new HOV lanes, new transit corridors, increased frequency along existing transit corridors, and noise generating future land use developments such as heavy manufacturing plants and other uses are generally expected to exceed the significance criteria when they occur near sensitive receptors. For comparison purposes,

noise levels along the busiest portions of the SR 99 corridor within Merced County was evaluated. Existing traffic noise levels were gathered using an Extech Type 2 sound level meter datalogger during the PM peak hour. Noise monitoring was conducted during the PM peak hour because traffic counts along SR 99 show a greater volume of traffic in the PM peak hour than the AM peak hour.

Existing traffic noise levels were then evaluated using the FHWA Traffic Noise Model (TNM 3.1). Traffic volumes collected from the model runs prepared for the 2022 RTP and posted vehicle speed limits along SR 99 were entered into the model to estimate noise levels at receptors adjacent to the corridors. As shown in Table 50, the noise levels determined in the field along SR 99 was 76.0 Leq(h) dBA. The noise levels are the same for Amendment No. 1 and for the 2022 RTP/SCS PEIR.

TABLE 50
SR 99 Noise Analysis

Receptor I.D. No.	Location	Existing Noise Level Leq(h) dBA	Existing Noise Level Modeled Leq(h) dBA	K - Factor (Measured - Modeled = K)	2019 Base Model Noise Level Leq(h) dBA	2046 Scenario 3 Noise Level Leq(h) dBA
1	Ashby Road - 75 feet from SR 99 Centerline	76.0	79.0	-3	75.0	78.0

Source: VRPA 2023

The impacts of the 2022 RTP/SCS Amendment No. 1 were analyzed considering the 2019 Base Year Model and the 2046 Plus Build (Scenario 3) conditions. Table 50 shows the predicted noise levels at the noise receptors evaluated under existing conditions. Results of the analysis show that noise levels under the 2046 Plus Build (2022 RTP/SCS Amendment No. 1 - Scenario 3) are projected to increase by 3.0 dBA's along SR 99 when compared to the 2019 Base Year Model. When it comes to noise levels, the Ldn is determined to be within +/- 2 dBA of the peak hour Leq under normal traffic conditions based upon Caltrans' Traffic Analysis Noise Protocol. Typical noise standards for residential land uses for local jurisdictions have a maximum noise level of 60 to 65 Ldn/CNEL. Therefore, impacts may occur if residential land uses are determined to be within 200 feet of SR 99 and no noise abatement improvements currently exist to shield the residential land uses from traffic noise.

Mitigation Measures

The specific impacts on noise will be evaluated as part of the implementing 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 MCAG does not have land use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below.

- ✓ **N 1** As part of the implementing agency's appropriate environmental review of each project, a project specific noise evaluation shall be conducted, and appropriate mitigation identified and implemented.

- ✓ **N 2** Implementing agencies should employ, where their jurisdictional authority permits, land use planning measures, such as zoning, restrictions on development, site design, and use of buffers to ensure that future development is compatible with adjacent transportation facilities and other noise generating land uses.

- ✓ **N 3** Implementing agencies shall, to the extent feasible and practicable, maximize the distance between noise-sensitive land uses and new roadway lanes, roadways, rail lines, transit centers, park-and-ride lots, and other future noise generating facilities.

- ✓ **N 4** Implementing agencies should construct sound reducing barriers between noise sources and noise-sensitive land uses. Sound barriers can be in the form of earth-berms or soundwalls. Constructing roadways so as appropriate and feasible that they are depressed below-grade of the existing sensitive land uses also creates an effective barrier between the roadway and sensitive receptors.

- ✓ **N 5** Implementing agencies shall, to the extent feasible and practicable, improve the acoustical insulation of dwelling units where setbacks and sound barriers do not sufficiently reduce noise.

- ✓ **N 6** Implementing agencies shall implement, to the extent feasible and practicable, speed limits and limits on hours of operation of rail and transit systems, where such limits may reduce noise impacts.

- ✓ **N 7** Passenger stations, central maintenance facilities, decentralized maintenance facilities, and electric substations should be located away from sensitive receptors.

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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Impact N 2 – Generation of excessive groundborne vibration or groundborne noise levels.

Construction activity, as described above, can result in ground vibration, depending upon the types of equipment used. Operation of construction equipment causes ground vibrations which spread through the ground and diminish in strength with distance from the source generating the vibration. Ground vibrations as a result of construction activities very rarely reach vibration levels that will damage structures but can cause low rumbling sounds and feelable vibrations for buildings very close to the site. Construction activities that generally create the most severe vibrations are blasting and impact pile driving.

Ambient vibration levels in residential areas are typically 50 VdB, which is well below human perception. The operation of heating/air conditioning systems and slamming of doors produce typical indoor vibrations that are noticeable to humans. The most common exterior sources of ground vibration that can be noticeable to humans inside residences include constructions activities, train operations, and street traffic. Table 49 above provides some common sources of ground vibration and the relationship to human perception. This information comes from the Federal Transit Administration's "Basic Ground-Bourne Vibration Concepts."

In order to estimate the impact of vibrations from construction activities as a result of the expanded or new transportation facilities or future land use development included in the 2022 RTP/SCS Amendment No. 1, the following formula was applied to evaluate ground vibration at a distance of 150 feet from the construction site.

$$Lv(D) = Lv(25\ ft) - 20 \log (D/25)$$

Using the highest vibration level shown in Table 51 (Lv 87) from construction related activities and the formula shown above, the anticipated vibration level at 150 feet from the construction area is 71 VdB. The values between Amendment No. 1 compared to the 2022 RTP/SCS PEIR did not change. Based on Table 49 above, vibration levels above 80 VdB would be considered excessive and would need to be mitigated. Therefore, at a distance of 150 feet from a construction area, the vibration levels would not be considered significant given the data provided in Table 51. The approximate vibration level at 50 feet from the construction area would generate vibration levels above 80 VdB based on the equipment listed in Table 51.

TABLE 51
Vibration Source Levels for Construction Equipment

Equipment	PPV at 25 ft (in/sec)	Approximate L_v* at 25 ft
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58

* RMS velocity in decibels (VdB) re 1 minch/second

Mitigation Measures

✓ **S**ee Mitigation Measures N 1 through N 7 above for Impact N 1.

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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Impact N 3 – For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

There are five (5) public use airport facilities in Merced County. These include the Castle Airport, Gustine Municipal Airport, Los Banos Municipal Airport, Merced Regional Airport, and Turlock Municipal Airport. Airport noise contours have been established for all airport facilities in the County and are consistent with the Federal Aviation Administration (FAA) Integrated Noise Model.

Generally, proposed projects are of the following two types:

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

During the construction of new highway and transit facilities or the modification of an existing system near one of the airports in Merced County, it is possible that construction workers will be temporarily exposed to excessive noise levels. Though construction activities are intermittent and temporary, there is the potential for workers to be subject to excessive noise levels if any construction activities are near or adjacent to any of the airports within Merced County.

Mitigation Measures

The specific impacts on noise will be evaluated as part of the implementing 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 MACG does not have land use authority to approve development projects, their role will be to encourage inclusion of the mitigation measures referenced below.

- ✓ **N 8** Compliance with Occupational Safety and Health Administration's (OSHA) hearing conservation amendment. The Permissible Exposure Level (PEL) is defined as an 8-hour time-weighted average sound level of 90 dBA integrating all sound levels from at least 90 dBA to at least 140 dBA. Project implementing agencies will comply with all local sound control and noise level rules, regulations, and ordinances.

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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce the significant impacts identified.

Findings

Considering the analysis results above for the proposed Amendment No. 1, no changes resulted with Amendment No. 1 when compared to the certified 2022 RTP/SCS PEIR. Furthermore, the analysis in

the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No. 1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant noise impacts or a substantial increase in the severity of noise impacts beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.13 Population, Housing and Employment

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to population, housing and employment beyond those already identified in the 2022 RTP/SCS PEIR. The 2022 RTP/SCS PEIR analyzed potential impacts to population growth and current residential and business land uses that could occur upon implementation of the 2022-2046 RTP/SCS. The 2022 RTP/SCS PEIR concluded that the Plan would result in significant impacts and significant cumulative impacts, including substantial induced population growth in areas adjacent to transit, displacement of existing businesses and homes, separation of residences from community facilities and services and impacts on vacant natural lands. The 2022 RTP/SCS PEIR also concluded that the plan would result in indirect significant impacts, including increased population distribution that is expected to occur due to the transportation investments and land use policies identified in the 2022 RTP/SCS (reference the 2022 RTP/SCS PEIR, pages 3-392 through 3-407). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The proposed changes stated in Amendment No.1, would not cause any population growth, nor would it affect housing and employment. As such, the analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. Therefore, incorporation of the proposed changes to the Project List would not result in any new significant impacts to population, housing and employment, or a substantial increase in the severity of impacts to population, housing and employment beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.14 Public Utilities, Other Utilities & Services Systems

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to public utilities, other utilities and services systems beyond those already identified in the 2022 RTP/SCS PEIR. Amendment No.1 would not place additional strain on public services and anticipated significant cumulative impacts include increased demand of storm water drainage facilities and water supplies and the demand for more police, fire, emergency personnel and facilities and demand for more school facilities and teachers during implementation of the 2022 RTP/SCS (reference the 2022 RTP/SCS PEIR, pages 3-408 through 3-442). Further, the changes would not substantially increase impervious surfaces or place a significantly higher level of demand on utilities systems and are therefore not expected to cause any new or substantial impacts previously discussed in the certified 2022-2046 RTP/SCS PEIR. Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed

projects (as revised by the 2022 RTP/ SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant impacts to public utilities, other utilities and services systems, or a substantial increase in the severity of impacts to public utilities, other utilities and services systems beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.15 Social and Economic Effects

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts social and economic conditions or effects beyond those already identified in the 2022 RTP/SCS PEIR. Implementation of the 2022 RTP/SCS PEIR would not result in significant cumulative impacts; therefore, it is not anticipated that minority and low-income communities would be disproportionately and adversely affected, as compared to other communities. It is further anticipated that the improvement projects will increase accessibility and address existing problems with the transportation network. The projects are not expected to disproportionately affect low-income communities in an adverse way, since these projects are dispersed throughout the region, and are designed to improve transportation facilities where they are needed most. As a result, this impact is considered less-than-significant. As a result, long-term impacts are considered less-than-significant (reference the 2022 RTP/SCS PEIR, pages 3-443 through 3-464). The analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/ SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List would not result in any new significant social or economic effects, or a substantial increase in the severity of impacts to social or economic conditions or effects beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

7.16 Transportation

The 2022 RTP/SCS PEIR section related to Transportation can be found on Pages 3-465 through 3-491 of the Draft PEIR.

The section has been revised to reflect the latest impact results reflective of the 2022 RTP/SCS and Amendment No.1. As noted previously, where table results with Amendment No. 1 have changed, the original table from the certified 2022 RTP/SCS PEIR is also provided below it to compare results. In almost all cases, changes are insignificant, or impacts are reduced with Amendment No. 1. As a result of these analyses, changes reflected in the 2022 RTP/SCS Amendment No.1 will not cause additional significant environmental effects referenced in the 2022 RTP/SCS PEIR.

This section provides analysis of the transportation impacts of 2022 RTP/SCS (the Project) along with additional discussion of the potential impacts of Amendment #1. Implementation of the Project will result in improvements to existing regional transportation and circulation systems. Proposed improvements are intended to fulfill required regional transportation needs. Proposed street and highway programs are aimed at reducing existing traffic and other transportation/circulation conflicts and resulting accident hazards. Implementation of planned improvements to the street and highway

network, improvement of County airports, provision of public transit facilities, identification of additional bikeways and pedestrian improvements, and improved transportation systems that accommodate goods movement will have beneficial effects on a region wide basis to address 2022 RTP/SCS objectives.

Regulatory Setting

Federal Regulations

- ✓ **U.S. Environmental Protection Agency (EPA) and Federal Clean Air Act (CAA)** - The Federal Clean Air Act 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 CAA Bill Amendments, passed in 1990, share responsibility with the State in reducing emissions from mobile sources. The U.S. Environmental Protection Agency (EPA) is responsible for enforcing the 1990 amendments.

  CAA 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 Transportation Improvement Program (TIP) be demonstrated to conform to the State Implementation Plan (SIP) before the RTP and TIP are approved by the Metropolitan planning organization (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.

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

- ✓ **Infrastructure Investment and Jobs Act/Bipartisan Infrastructure Law (BIL) -** On November 15, 2021, President Biden signed the Infrastructure Investment and Jobs Act (IIJA) (Public Law 117-58, also known as the "Bipartisan Infrastructure Law") into law. The Bipartisan Infrastructure Law is the largest long-term investment in our infrastructure and economy in our Nation's history. It provides $550 billion over fiscal years 2022 through 2026 in new Federal investment in infrastructure, including in roads, bridges, and mass transit, water infrastructure, resilience, and broadband.

  With respect to the Metropolitan Planning Program, the BIL continues many of the programs and regulations established previously in the Fixing America's Surface Transportation (FAST) Act and Moving Ahead for Progress in the 21st Century Act (MAP-21). Some key changes are noted below:

- The BIL requires each MPO to use at least 2.5% of its PL funds (and each State to use 2.5% of its State Planning and Research funding under 23 U.S.C. 505) on specified planning activities to increase safe and accessible options for multiple travel modes for people of all ages and abilities. A State or MPO may opt out of the requirement, with the approval of the Secretary, if the State or MPO has Complete Streets standards and policies in place and has developed an up-to-date Complete Streets prioritization plan that identifies a specific list of Complete Streets projects to improve the safety, mobility, or accessibility of a street. For the purpose of this requirement, the term "Complete Streets standards or policies" means standards or policies that ensure the safe and adequate accommodation of all users of the transportation system, including pedestrians, bicyclists, public transportation users, children, older individuals, individuals with disabilities, motorists, and freight vehicles.
- The BIL requires the United States Department of Transportation to amend Federal regulations to define a metropolitan transportation plan's outer year as beyond the first four years.
- The BIL requires an MPO that serves an area designated as a transportation management area, when designating officials or representatives for the first time and subject to the MPO's bylaws or enabling statute, to consider the equitable and proportional representation of the population of the metropolitan planning area.
- The BIL allows MPOs to use social media and other web-based tools to encourage public participation in the transportation planning process.

The BIL makes several changes to include housing considerations in the metropolitan transportation planning process, including:

- updating the policy to include, as items in the national interest, encouraging and promoting the safe and efficient management, operation, and development of surface transportation systems that will better connecting housing and employment;
- adding officials responsible for housing as officials with whom the Secretary shall encourage each MPO to consult;
- requiring the metropolitan transportation planning process for a metropolitan planning area to provide for consideration of projects and strategies that will promote consistency between transportation improvements and State and local housing patterns (in addition to planned growth and economic development patterns);
- adding assumed distribution of population and housing to a list of recommended components to be included in optional scenarios developed for consideration as part of development of the metropolitan transportation plan;
- adding affordable housing organizations to a list of stakeholders MPOs are required to provide a reasonable opportunity to comment on the metropolitan transportation plan; and
- within a metropolitan planning area that serves a transportation management area, permitting the transportation planning process to address the integration of housing, transportation, and economic development strategies through a process that provides for effective integration, including by developing a housing coordination plan.

✓ **Metropolitan Planning General Requirements –** Under BIL as previously established in MAP-21, the U.S. Department of Transportation (USDOT) requires that metropolitan planning organizations, such as MCAG, prepare long-range transportation plans (RTPs) and update them

every four years if they are in areas designated as "nonattainment" or "maintenance" for federal air quality standards. Prior to enactment of MAP-21, the primary federal requirements regarding RTPs were included in the metropolitan transportation planning rules—Title 23 CFR Part 450 and 49 CFR Part 613. Key federal requirements for long range plans include the following:

- RTPs must be developed through an open and inclusive process that ensures public input; seeks out and considers the needs of those traditionally under served by existing transportation systems; and consults with resource agencies to ensure potential problems are discovered early in the RTP planning process;
- RTPs must have a financially constrained element, transportation revenue assumptions must be reasonable, and the long-range financial estimate must take into account construction-related inflation costs;
- RTPs must include a description of the performance measures and performance targets used in assessing the performance of the transportation system;
- RTPs must include a system performance report evaluating the condition and performance of the system with respect to performance targets adopted by the state that detail progress over time;
- RTPs may include multiple scenarios for consideration and evaluation relative to the state performance targets as well as locally developed measures;
- RTPs must conform to the applicable federal air quality plan, called the State Implementation Plan (SIP), for ozone and other pollutants for which an area is not in attainment; and
- RTPs must consider planning factors and strategies in the local context.

✓ **Transportation Security Administration (TSA) -** The TSA is responsible for the security of the nation's transportation system. Highways, railroads, buses, mass transit systems, and ports are all monitored by the TSA in conjunction with state, local, and regional partners to ensure safety. The TSA focuses most of its resources on aviation security.

State Regulations

✓ **California Environmental Quality Act (CEQA) -** CEQA defines a significant impact on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the individual improvement 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.).

✓ **Senate Bill 226 –** In 2011, Senate Bill 226 (SB 226) was passed by the legislature and signed into law. SB 226 provides a revision to the CEQA Guidelines moving forward an efficient review process for infill projects, including performance standards to determine an infill project's eligibility for that review. One of the requirements for streamlined review demands that the project be consistent with the general use designation, density, building intensity, and applicable policies specified for the project area in either a sustainable communities strategy or an alternative planning strategy.

- ✓ **2013 Zero Emission Vehicle Action Plan -** Governor Brown issued Executive Order B-16-2012 in 2012, which calls for the rapid commercialization of zero emission vehicles (ZEV). The goal of this Executive Order is to have 1.5 million ZEVs on California's roads by 2025. The order targets the transportation sector and calls for a reduction of GHG emissions to 80 percent below 1990 levels by 2020.

- ✓ **California Transportation Commission Regional Transportation Plan Guidelines -** The CTC publishes and periodically updates guidelines for the development of long-range transportation plans. Pursuant to Government Code Section 65080(d), each nonattainment regional transportation planning agency (RTPA) is required to adopt and submit an updated regional transportation plan (RTP) to the California Transportation Commission (CTC) and the Department of Transportation (Caltrans) at least every four years and attainment RTPA's every five years.

  Under Government Code Section 14522, the CTC is authorized to prepare guidelines to assist in the preparation of RTPs. The CTC's RTP guidelines suggest that projections used in the development of an RTP should be based upon available data (such as from the Bureau of the Census), use acceptable forecasting methodologies, and be consistent with the Department of Finance baseline projections for the region. The guidelines further state that the RTP should identify and discuss any differences between the agency projections and those of the Department of Finance.

  The most recent update to the RTP guidelines were published in 2017 and includes updates to State Climate Change Legislation and Executive Orders, as well as guidance on the applicability of the RTP Guidelines. It also describes Senate Bill 743 and the anticipated future change to transportation analysis for transit priority areas.

- ✓ **AB 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 was required to adopt regulations by January 1, 2011 to achieve reductions in GHGs to meet the 1990 emission cap by 2020.

On December 11, 2008, CARB adopted its initial 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's 2017 Climate Change Scoping Plan builds on the efforts and plans encompassed in the initial Scoping Plan. The current plan has identified new policies and actions to accomplish the State's 2030 GHG limit.

- ✓ **California Global Warming Solutions Act of 2006: emissions limit**, or **SB 32** – SB 32 is a California Senate bill expanding upon AB 32 to reduce greenhouse gas (GHG) emissions. The lead author is Senator Fran Pavley and the principal co-author is Assembly member Eduardo Garcia. SB 32 was signed into law on September 8, 2016, by Governor Edmund Gerald "Jerry" Brown Jr. SB 32 sets into law the mandated reduction target in GHG emissions as written into Executive Order B-30-15. SB 32 requires that there be a reduction in GHG emissions to 40% below the 1990 levels by 2030. Greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, sulfur hexafluoride, hydrofluorocarbons, and perfluorocarbons. The California Air Resources Board (CARB) is responsible for ensuring that California meets this goal. The provisions of SB 32 were added to Section 38566 of the Health and Safety Code subsequent to the bill's approval. The bill went into effect January 1, 2017. SB 32 builds onto Assembly Bill (AB) 32 written by Senator Fran Pavley and Assembly Speaker Fabian Nunez passed into law on September 27, 2006. AB 32 required California to reduce greenhouse gas emissions to 1990 levels by 2020 and SB 32 continues that timeline to reach the targets set in Executive Order B-30-15. SB 32 provides another intermediate target between the 2020 and 2050 targets set in Executive Order S-3-05.

- ✓ **Senate Bill 375 -** Sen. Bill No. 375 (Stats. 2008, Ch. 728) (SB 375) requires MPOs to prepare a Sustainable Communities Strategy (SCS) that demonstrates how the region will meet its greenhouse gas (GHG) reduction targets through integrated land use, housing, and transportation planning. Specifically, the SCS must identify a transportation network that is integrated with the forecasted development pattern for the plan area and will reduce GHG emissions from automobiles and light trucks in accordance with targets set by the California Air Resources Board. Sections 3-4 and 3-6 in this Chapter include more in-depth discussions of SB 375 and its implications for the proposed RTP.

- ✓ **Senate Bill 743 (SB 743) -** On September 27, 2013, Governor Brown signed Senate Bill 743 (Steinberg, 2013). Among other things, SB 743 creates a process to change analysis of transportation impacts under CEQA. Currently, environmental review of transportation impacts focuses on the delay that vehicles experience at intersections and on roadway segments. That

delay is measured using a metric known as "level of service," or LOS. Mitigation for increased delay often involves increasing capacity (i.e., the width of a roadway or size of an intersection), which may increase auto use and emissions and discourage alternative forms of transportation. Under SB 743, the focus of transportation analysis will shift from driver delay to reduction of greenhouse gas emissions, creation of multimodal networks and promotion of a mix of land uses.

Specifically, SB 743 requires the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines (Title 14 of the California Code of Regulations sections and following) to provide an alternative to LOS for evaluating transportation impacts. Particularly within areas served by transit, those alternative criteria must "promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses." Measurements of transportation impacts may include "vehicle miles traveled, vehicle miles traveled per capita, automobile trip generation rates, or automobile trips generated." OPR also has discretion to develop alternative criteria for areas that are not served by transit, if appropriate.

Formal adoption of SB 743 into CEQA occurred in December 2018 with a required implementation date of July 1, 2020. CEQA evaluations conducted after July 1, 2020 are now using vehicle miles traveled (VMT) as the performance measure for the determination of transportation impacts.

- ✓ **Executive Order (EO) B-32-15, Sustainable Freight Transport Initiative –** Governor Brown signed Executive order B-32-15 on July 17, 2015 to require the Secretary of the California State Transportation Agency, the Secretary of Cal/EPA, and the Secretary of the Natural Resources Agency to lead other relevant State departments including the CARB, the Caltrans, the California Energy Commission (CEC), and the Governor's office of Business and Economic Development to improve freight efficiency, transition to zero-emission technologies, and increase competition of the State's freight system.

- ✓ **Intelligent Transportation System (ITS) -** Intelligent Transportation System (ITS) incorporates the use of advanced applications to improve the safety, coordination of surface transport networks. ITS provides a non-traditional alternative to transportation applications and new infrastructure. As travel demand on road transport systems grows, there is a need to increase capacity but also improve the systems through improved management. Collaboration between transportation planning and operations is critical in metropolitan regions and corridors with high volumes where a number of jurisdictions, agencies, and service providers are responsible for safety, security, and operation of transportation systems. The success of ITS depends on the careful coordination communication of all parties involved at all levels, it is equally important that there exists a regional forum to achieve the coordination and communication in an effective manner.

- ✓ **Assembly Bill 1358, the Complete Streets Act of 2008 (AB 1358) -** The California Government Code Section 65302 was amended by AB 1358 to require all substantive revisions to city and county Circulation Element include accommodations for all roadway users. This included bicyclist and pedestrians.

- ✓ **California Bicycle Transportation Act -** This act, passed in 1994, requires the adoption of a bicycle master plan by all cities and counties before being considered eligible to apply for funding from the Bicycle Transportation Account.

- ✓ **Senate Bill 1014** - The Clean Miles Standard and Incentive Program (SB 1014) requires the California Public Utilities Commission (CPUC) and California Air Resources Board (CARB) to establish and implement greenhouse gas emission reduction targets and goals for transportation network companies (TNCs). The State is establishing targets in 2021. TNCs will be required to develop GHG emission reduction plans beginning January 1, 2022, with targets and goals starting in 2023. In the proposed rulemaking, TNCs will be able to comply with the rule through any combination of electrification, reduction of miles without passengers, increased ridesharing, and optional credits.

Regional and Local Statutes

- ✓ **Local Agency General Plans -** State law requires cities and counties to adopt general plans, which must include a transportation element. The transportation element describes the acceptable operating standards, levels of service, classifications, and transportation related goals of a given city or county; it is typically a multimodal section that addresses roads, public transit, bicycle facilities, and pedestrian facilities. This EIR does not explicitly identify localized traffic issues that might be the focus of a city's general plan; rather, it will deal with issues of overall system performance from a regional perspective.

- ✓ **City and County Modal Plans -** City- and county-wide bicycle and pedestrian master plans, active transportation plans, freight/goods movement plan, and other mode-specific plans serve as policy documents to guide the development and maintenance of the transportation network, support facilities, and non-infrastructure programs. These plans describe the acceptable operating standards, levels of service, facility classifications, and mode-specific goals and policies of a given city or the county.

Environmental Setting

The existing conditions section for the transportation and circulation systems within Merced County have been broken down into six subsections and are generally described below. Further detail regarding the existing systems, system needs, and system actions is provided in Chapter 2 of this EIR.

Multi-modal Transportation System

The planned transportation/circulation system provides the basic network used for the movement of goods and people in the region. Regional streets and highways are used by nearly all travel modes including automobiles, ridesharing vehicles, public and common carrier transit, the intra- and inter-regional trucking industry, bicyclists, pedestrians, and other non-motorized modes of transportation. These systems must operate efficiently in order to reduce traffic congestion, improve air quality, and move people and goods safely.

The RTP systems are composed of the regional streets and roads that include federal interstate and State highways, regional arterials, and other regional street and road facilities. The RTP also addresses future transportation/circulation system's needs, including mass transportation, aviation, non-motorized, and goods movement. A list of planned improvement projects along each of these systems is provided in the RTP and the list of improvement projects and programs contained in the RTP are provided in Section 2 of this Draft EIR. These planned projects are considered to be "financially constrained"; therefore, the likelihood for implementation prior to the horizon year of 2046 is assumed. The impact analysis of each mode on the planned transportation/circulation system is provided below. The analysis was developed with the assumption that only financially constrained projects would be implemented during the life of the Project.

The sprawling pattern commonly associated with California transportation networks provides fewer modal options to commuters. Multimodal efforts in Merced County are focused on enhancing existing conditions and creating environmentally favorable patterns of travel. Based upon information provided in the RTP, transportation planning has relied heavily in the past upon the analysis of separate and discrete transportation modes. However, as the County tries to deal with congestion and the problems of air pollution, there is a growing awareness that solutions must be evaluated within the context of an integrated system, rather than by individual mode only. This systematic look at the region's capabilities encourages analysis and planning, which look at transportation systems that can be brought to the resolution of a need for travel or movement of goods. This approach is helped by looking at the characteristics of our region, which may affect travel demands, including but not limited to those, which follow:

- ✓ Merced is the major population center for the County.
- ✓ State Route 140 is a key access roadway to Yosemite National Park, one of the two most visited national parks in the nation. More than 5 million people visited Yosemite National Park in 2016, 93% of whom came by automobile.
- ✓ As a large producer of farm commodities, Merced County has a strong "farm-to-market" travel demand affecting local roads and the state highway system. Freight movement occurs throughout the County, as farm agricultural and other commodities are brought to market and onto interregional routes.
- ✓ The county is crossed by two north-south corridors, Freeway 99, and Interstate 5, each of which is vital to the statewide transportation network.
- ✓ Recreational trips are served by several state highways: Routes 99, 152, and 140 and Interstate 5.
- ✓ Amtrak serves Merced and is experiencing increasing ridership, despite limited rail service to

Sacramento and a lack of service to southern California. Merced also serves as the rail transfer point for Amtrak bus services to Yosemite National Park.

- ✓ While the distances between destinations and low housing densities have encouraged automobile travel, there are still both urban and rural populations that rely on public transit service. The transit systems are responsible for meeting State and Federal farebox and ridership requirements.
- ✓ The climate and terrain are compatible with bicycle ridership for short commutes and recreational trips.
- ✓ Existing rail lines offer potential for an expanding share of commodity movement.

Any ultimate state of multimodal transportation service would be a system in which a traveler could make a "seamless" journey with connections between modes, taking minimum effort and involving little delay. Currently, such an ideal state can be reached only in the country's largest and densest cities. In these areas, land use densities and developed commuter rail lines, subways, transit buses, trolleys, airport shuttles and taxis offer a variety of choice and scheduling flexibility that make travel times and accessibility reliable. In the Central Valley, where cities have experienced much of their growth since the automobile's debut, residential densities tend to be comparatively low, with streets and land uses designed to encourage automobile use and storage.

During hot summer days when upper temperatures can remain around 100 degrees, an air-conditioned car is highly attractive. It will require an even stronger commitment to air quality and quality-of-life goals in Merced County to make the changes needed to implement the "seamless" multimodal system. It involves people making conscious choices to use alternative transportation modes and providing those alternate systems in a manner that encourages their use. To succeed, those efforts would have to focus on long-term changes, which are part of the preferred scenario, Connect and Conserve Merced County:

- ✓ Increasing land use and residential densities, particularly along corridors used for transit.
- ✓ Facilitating mixed land use districts that promote living, working, shopping and recreation accessible by foot or bicycle, and that are served by centrally located transit routes
- ✓ Expanding transit systems and service frequency.
- ✓ Developing connected bikeway systems and encouraging their use.
- ✓ Improving connectivity between transit and rail, transit, cycling and transit, etc.
- ✓ Reserving future "park-and-ride" opportunities.
- ✓ An organized public education effort.
- ✓ Appropriate financing, including both operational and capital investment.

Details regarding the multi-modal transportation system in Merced County are provided in Chapter 2 of the Draft 2022 RTP/SCS PEIR.

Highways, Streets and Roads

✓ Regionally Significant Road System

Merced County's Regionally Significant Roads System includes Interstate 5, Highways 33, 59, 99, 140, 152, and 165 as well as future extensions of these roadways. In addition, many city and County roads are used for commute, agricultural, recreational, and scenic purposes. With urbanization taking place in the County, commuter and business trips are increasing.

MCAG, in conjunction with its member agencies and Caltrans, has developed the "Regionally Significant Road System" for transportation modeling purposes based on the Federal Highways Administration (FHWA) Functional Classifications System of Streets and Highways. In general, the classification systems used by local agencies coincide with the FHWA Functional Classification System; however, when it comes to design standards or geometrics of a particular street or road within a local jurisdiction, each of the local agencies has their own specific design criteria.

There is a significant distinction between the Regionally Significant Roads System and the Countywide Network. Regionally significant projects are statutorily required to be treated separately for air quality reasons. Chapter 2 of this EIR contains figures of the regionally significant road system in Merced County and provides further details regarding this mode of transportation.

✓ Functional Classification System

Functional classification is the process by which streets and highways are grouped into classes, or systems, according to the type of service they are intended to provide. Fundamental to this process is the recognition that individual streets and roads do not serve travel independently in any major way. Rather, most travel involves movement through a network of roads. It becomes necessary to determine how this travel can be channelized within the network in a logical and efficient manner. Functional classifications define the channelization process by defining the area that a particular road or street should service through a highway network. Table 52 defines the functional classes in urban areas and Table 53 defines functional classes in rural areas.

TABLE 52
Urban Functional Classification System-Definitions

Classification	Primary Function	Direct Land Access	Speed Limit	Parking
Fwy/Expwy	Traffic Movement	None	45-65	Prohibited
Primary Arterial	Traffic Movement/ Land Access	Limited	35-45	Prohibited
Secondary Arterial	Traffic Movement/ Land Access	Restricted	30-35	Generally Prohibited
Collector	Distribute Traffic Between Local Streets & Arterials	Safety Controls, Limited Regulation	25-30	Limited
Local	Land Access	Safety Controls Only	25	Permitted

TABLE 53
Rural Functional Classification System-Definitions

Classification	Primary Function	Direct Land Access*	Speed Limit**	Parking***
Fwy/Expwy	Traffic Movement	Safety Controls	55-70	Prohibited
Arterial	Traffic Movement/ Land Access	Safety Controls	55	Permitted
Collector	Distribute Traffic Between Local Streets & Arterials	Safety Controls	55	Permitted
Local	Land Access	Safety Controls	55	Permitted

*Access to arterials is generally limited or restricted if it provides access to a land subdivision or an industrial, commercial, or multi-family use. Access is granted on a controlled basis to parcels fronting on expressways where there is not a frontage road or access to another road.
** All County roads have a 55-mph operating speed unless otherwise indicated.
*** Parking is permitted on all County roads unless otherwise indicated.

Public Transit Existing Conditions

Existing public transit services in Merced County consist of both bus transit and AMTRAK rail passenger service. Transit services include inter-city, fixed-route, and demand-responsive operations. Common carriers within Merced County include Amtrak, Greyhound, and others.

In Merced County, urban public transportation is provided by the Transit Joint Powers Authority of Merced County (The Bus). Currently, The Bus operates 15 fixed routes and two deviated fixed routes throughout the region and provides paratransit service for qualifying individuals who cannot access the fixed-route service. Since 2021 it has offered flexibly routed microtransit services (the Mic on the Westside of the County, with plans to offer microtransit on the Eastside as well. The Bus carries approximately 1,000,000 passengers per year.

Bus transportation to Yosemite National Park is provided by the Yosemite Area Regional Transportation System (YARTS).

Passenger rail service is provided by the Amtrak San Joaquins, which will soon be supplemented by the Altamont Corridor Express (ACE) Rail Service and a future high speed rail passenger service, as described in the Railroad and Goods Movement section of this Section.

Details regarding these and other public transit systems and a graphics depicting the systems within the County are provided in Chapter 2 of this EIR.

Aviation

Merced County has several public use airports, as depicted in Chapter 2, with the Merced Regional Airport (MCE) being the primary passenger airport facility in the region.

Details regarding these and other public use airports and a graphic depicting the airports within the County are provided in Chapter 2 of this EIR.

Active Transportation Existing Conditions

A Regional Active Transportation Plan is currently under development and will identify opportunities to improve and increase non-motorized travel options and expand access to public transportation systems across the County and its Cities. It will identify a network of safe and attractive trails, sidewalks, and bikeways that connect Merced County residents to key destinations, especially local schools, parks, and transit, and establish a network of regional bikeways that allows bicyclists to safely ride within cities and access regional destinations.

The cities and Merced County each have their own bike and active transportation plans and are increasingly involved in implementing bicycle infrastructure. Local planning efforts also include hiking trail systems and pedestrian facilities. Pedestrian facilities hold particular importance in community design and redesign in working toward a more livable environment. This RTP recognizes the value of

trail systems for recreational purposes, as enhancements to the multimodal transportation system, and for their contribution to an improved quality of life in Merced County and, therefore, supports their continued development.

For many, the use of bicycles as a means of transportation has several appealing aspects. Bicycling has positive air quality; energy, economic and health impacts and can reduce automobile congestion. From an air quality perspective, every bicycle trip that substitutes for auto travel, results in cleaner air. Bicycles do not consume scarce fuel, maintenance is low, and bicycling can be used for commuting as well as for recreational purposes while it promotes physical exercise. Existing and planned urban bikeways are shown in Chapter 2.

The bicycle's door-to-door capability for shorter trips makes it an attractive alternative mode of transportation in the Merced region when the climate is mild because the flat terrain is ideal for riding. Implementation of a bikeway system will provide connectivity between cities and access to destinations of regional interest, as well as commuter lanes in Merced County.
Goals for the development of bicycle transportation in Merced County are as follows:

- ✓ Planning - Recognizing and integrating bicycling and walking as valid and healthy transportation modes in transportation planning activities.
- ✓ Physical Facilities - Safe, convenient, and continuous routes for bicyclists and pedestrians of all types that interface with and complement a multimodal transportation system.
- ✓ Safety and Education - Improved bicycle and pedestrian safety through education and enforcement
- ✓ Encouragement - Increased acceptance of bicycling both as a legitimate transportation mode on public roads and highways and as a transportation mode that is a viable alternative to the automobile.
- ✓ Implementation - Maximizing funding opportunities to increased development of the regional bikeways system, related facilities, and pedestrian facilities.

Further details regarding the planned bikeways system are provided in Chapter 2 of this EIR along with figures depicting the existing and planned system. The plan calls for community routes and routes that link communities and provide access to activity centers, including major commercial and employment centers, major recreational sites, and schools. All of the cities in the County and the County itself have planned bikeway facilities, although limited available funding has had an impact on their construction. Nevertheless, local agencies continue to add to the inventory of completed bikeways on an ongoing basis, particularly in conjunction with new development.

Railroad and Goods Movement

The San Joaquin Amtrak route provides passenger rail service to Oakland, Sacramento, and Bakersfield several times daily. Amtrak also provides bus service from various rail stations along the San Joaquin route to cities that are not accessible by rail, such as Los Angeles and San Diego.

The rail network in Merced County consists of operating main and branchline right-of-way (reference Chapter 2. Union Pacific Railroad (UP) and the Burlington Northern Santa Fe Railway (BNSF) each operate one mainline that passes through Merced County. Additionally, the railroads operate many spur lines to serve industrial and agricultural clients, some of which operate on adjacent property by agreement between the railroad and the property owner.

The Amtrak San Joaquins service continues to play an important role in the San Joaquin Valley's balanced transportation system, filling a service level void that exists in mass transit between intercity bus and airline services. The San Joaquin Joint Powers Authority (SJJPA) manages the Amtrak San Joaquins service, with Amtrak operating five trains per day between Bakersfield and Oakland and two trains per day between Bakersfield and Sacramento with each train making one, daily round trip. This allows for seven north-bound and seven south-bound trains each day at Merced County's Amtrak Station in downtown Merced. Amtrak also operates dedicated bus service connecting rail stations with cities not directly served by the San Joaquins trains. These Amtrak thruway buses are critical to system performance, providing connections at the Sacramento, Lodi, Stockton, Oakland, Emeryville, Martinez, Merced, Merced, Hanford, and Bakersfield stations.

The San Joaquin Regional Rail Commission (SJRRC) operates the Altamont Corridor Express (ACE) train service, which will be extended to Merced and either Livingston or Atwater by the late-2020s. ACE will provide commuter-oriented connections to San Jose and Sacramento and points in between. It will also connect with the California High Speed Rail service in the San Joaquin Valley at Merced in the 2030s.

RTP Policies

The RTP Policy Element seeks to identify the transportation goals, objectives, and policies that meet the regional needs. Goals, objectives, and policies are established to direct the courses of action that will provide efficient, integrated multimodal transportation systems to serve the mobility needs of people, including accessible pedestrian and bicycle facilities, and freight, while fostering economic prosperity and development, and minimizing mobile sources of air pollution. The 2022 RTP reflects transportation planning for Merced County through the year 2046. Because Merced County is one of eight MPOs that make up the San Joaquin Valley Air Basin, we are linked for regional transportation planning through air quality guidelines. As such, the Needs Assessment is addressed on the regional Valley level and can be found in RTP/SCS Appendix R, the *San Joaquin Valley Regional Transportation Chapter*; the *Regional Setting, State and Federal Issues Chapter*; and is further developed in the *Needs Assessment and Action Element Chapter* (available for review at the San Joaquin Valley Air Pollution Control District). The Action Plan describes the programs and actions necessary to implement the Goals of the RTP/SCS. The Investment Plan Chapter summarizes the cost of plan implementation constrained by a realistic projection of available revenues.

In addition, the 2022 RTP also includes the Sustainable Communities Strategies (SCS) for Merced County. As such, a separate committee and public participation process was followed. Performance measures /indicators were developed to evaluate the scenario process and can be found in the Scenario Development and Scenario Evaluation chapters of the 2022 RTP/SCS.

Additional details regarding the Policy Element are provided in Chapter 2 of this EIR. In developing the Policy Element for the 2022 RTP broad overarching focus points are evident: preservation of existing facilities, sound financial management with leveraging of existing funding, balancing transportation needs with land use, and meeting state targets regarding greenhouse gas reduction.

Environmental Impacts, Mitigation Measures, and Significance After Mitigation

Criteria for Significance

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

- ✓ Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.
- ✓ Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).
- ✓ Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- ✓ Result in inadequate emergency access.

Generally, proposed projects are of the following two types:

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

Impact 3.17.1 – Conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities transit.

A description of the existing transportation system is provided earlier in this section.

The 2022 RTP approach and strategies align with other regional programs, plans, and policies, including MCAG's programs to administer State and federal programs. MCAG partners with other regional and local agencies to assure alignment of transportation strategies. The core approach of directing growth to infill areas and providing sustainable transportation options to reduce emissions, improve mobility and access, reduce congestion, and increase safety on the transportation system is reflective of federal, State, and local efforts. Implementation of the proposed Plan is not expected to

substantially conflict with a program, plan, ordinance, or policy addressing the circulation system, including transit, roadway, bicycle, and pedestrian facilities.

Mitigation Measures

Not applicable.

Significance After Mitigation

Not applicable.

Impact 3.17.2 – Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).

As noted in CEQA Guidelines Section 15064.3(a), in general, vehicle miles traveled is the most appropriate measure of transportation impacts. CEQA Guidelines Section 15064.3(b) provides the criteria for analyzing and determining transportation impacts, as follows:

The criteria in Section 15064.3(b) are primarily directed toward the assessment of project-level impacts, whereas the proposed Plan is a regional long-range plan integrating a region-wide suite of projects, programs, and policies, and the proposed Plan is analyzed using regional models. While VMT has been established as the new measure of transportation impacts under SB 743 (see the Regulatory Setting section for further discussion of SB 743), CEQA allows lead agencies to determine the methodology for evaluating VMT (CEQA Guidelines Section 15064.3(b)(4) and to establish a threshold of significance (CEQA Guidelines Section 15064.7).

The State has developed resources to help lead agencies evaluate impacts and establish impact thresholds under the new VMT standard. Key guidance relevant to transportation impacts and VMT include the Technical Advisory on Evaluating Transportation Impacts in CEQA (Governor's Office of Planning and Research 2018) and the California Air Resources Board's (CARB) 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals (CARB 2019).

The Technical Advisory prepared by the Office of Planning and Research (OPR) provides guidance on determining significance thresholds and assessing VMT. The Technical Advisory is directed to specific projects by project type (i.e., residential, retail, office, etc.) and local plans (i.e., general plans), and includes recommendations for evaluating transportation impacts. OPR uses the Statewide greenhouse gas targets established through 2050 by State laws and executive orders as the basis for its recommended VMT significance thresholds. For project-level analyses, OPR recommends that "a per capita or per employee VMT that is fifteen percent below that of existing development may be a reasonable threshold" based on their review of relevant research on project-level impact mitigation measures. The OPR guidance addresses general plans (and lesser area plans), but not regional plans: "A general plan, area plan or community plan may have a significant impact on transportation if proposed new residential office, or retail land use would, in aggregate, exceed the respective thresholds" for the project level thresholds, a per capita VMT that is fifteen percent below existing development.

In the 2017 Scoping Plan-Identified VMT Reductions and Relationship to State Climate Goals, CARB describes VMT estimates associated with a scenario developed for the 2017 Scoping Plan Update. The scenario assumed a combination of vehicle technologies, vehicle fuels, and slower VMT growth that would achieve the Statewide 2050 GHG emission reductions targets (80% below 1990 levels by 2050, as established under EO S-03-05). The assessment is based on a scenario CARB developed that would achieve the GHG goals through a combination of cleaner vehicles and fuels and slower VMT growth. Based on the scenario assessment, CARB found that for light-duty vehicle travel, per-capita VMT would need to be 16.8 percent lower than existing levels (Statewide 2015-2018 average VMT per capita) by 2050, and for overall vehicle travel, per-capita VMT would need to be 14.3 percent lower than existing levels to be consistent with the 2050 State climate goals (CARB 2019). However, CARB also stresses that the VMT developed in these estimates "is not household-generated VMT, and the values are not directly comparable to output from a local or regional travel demand model." Based on the above, no thresholds for assessing significant impacts in VMT at the regional level, such as for an RTP/SCS, have been established by the State.

Although the reduction amounts developed by OPR and CARB may not apply to significance thresholds for an RTP/SCS, they establish standards that may be used for lead agencies as guidance, subject to lead agency discretion as discussed above.

It is noted that the aggregate GHG emission reduction sought after by CARB in the 2017 Scoping Plan is 15 percent statewide. This is one reason OPR believes the 15 percent reduction in VMT is appropriate. The aggregate 15 percent GHG emission reduction applies across all land use and transportation activities and would indicate that the State and its individual MPOs are compliant with the SB 375 goals, the overall State climate change strategy, and Scoping Plan objectives.

Tables 54A and 54B provide VMT results from the 2022 RTP for 2019 Baseline and 2046 Horizon Year conditions with Amendment No.1 compared to the 2022 RTP/SCS PEIR. The regional model is not able to accurately evaluate the VMT implications of strategies such as telework, TDM/TSM, electric vehicle adoption and charging infrastructure, carpool/vanpool programs, and bicycle/pedestrian infrastructure improvements. Therefore, the future results shown below are considered to be conservative and the actual VMT reductions would be greater.

TABLE 54A
VMT and VMT/Capita Estimates
2019 Baseline, 2046 No Build, 2046 With 2022 RTP/SCS & 2046 With Amendment No. 1 - 2023

	2019 Baseline	2046 No Build	2046 With 2022 RTP/SCS (Scenario 3 - Preferred Project)	2046 With 2022 RTP/SCS Amendment # 1
VMT:	7,475,157	9,518,479	9,332,225	9,319,711
Population:	280,441	362,542	362,542	362,542
VMT/capita	26.66	26.25	25.74	25.71

TABLE 54B
VMT and VMT/Capita Estimates
2019 Baseline, 2046 No Build, 2046 With 2022 RTP/SCS - 2022

	2019 Baseline	2046 No Build	2046 With 2022 RTP/SCS (Scenario 3 - Preferred Project)
VMT:	7,475,157	9,518,479	9,332,225
Population:	280,441	362,542	362,542
VMT/capita:	26.66	26.25	25.74

The 2022 RTP/SCS Scenario 3 (preferred scenario) lowers VMT/capita compared to the 2046 No Project condition and results in a 3.4% decrease in VMT/capita compared to the 2019 Baseline.

Mitigation Measures

Implementation of multimodal improvement projects and programs and land use plans that consolidate growth in infill areas served by transit will generally serve to lower VMT/capita but fall short of achieving the types of reductions needed to achieve a less than significant result.

To address VMT impacts, the following mitigation measures are recommended.

- ✓ **TT 3.17.2-1** Measures intended to reduce VMT and reduce VHT or congestion levels are part of the RTP/SCS. These include: increasing rideshare and work-at-home opportunities to reduce demand on the transportation system, investments in non-motorized transportation, maximizing the benefits of the land use/transportation connection through increased densities, other Travel Demand Management measures described in the RTP and in local agency General Plans, and key

transportation investments (such as expanding microtransit service and streamlining and increasing frequencies of bus transit service) targeted to reduce congestion levels and improve LOS.

- ✓ **TT 3.17.2-2** MCAG will continue to secure funding programs considering a project's ability to enhance complete streets objectives where it is feasible.

- ✓ **TT 3.17.2-3** Beyond the currently financially and institutionally feasible measures included in the 2022 RTP/SCS, MCAG will identify further reduction in VMT, and fuel consumption that could be obtained through land-use strategies, additional car-sharing programs, additional vanpools, and additional bicycle/pedestrian programs.

- ✓ **TT 3.17.2-4** Transportation Planning: MCAG will assist local jurisdictions to encourage new developments to incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation.

- ✓ **TT 3.17.2-5** Local jurisdictions are encouraged to promote ride sharing programs e.g., by designating a certain percentage of parking spaces for high-occupancy vehicles, providing larger parking spaces to accommodate vans used for ridesharing, and designating adequate passenger loading and unloading and waiting areas.

- ✓ **TT 3.17.2-6** Local jurisdictions are encouraged to support bicycling and walking by incorporating bicycle lanes into street systems in regional transportation plans, new subdivisions, and large developments, creating bicycle lanes and walking paths directed to the location of schools and other logical points of destination and provide adequate bicycle parking, and encouraging commercial projects to include facilities on-site to encourage employees to bicycle or walk to work.

- ✓ **TT 3.17.2-7** Transit agencies are encouraged to support bicycling to transit facilities by providing additional bicycle parking, locker facilities, and bike lane access to transit facilities when feasible.

- ✓ **TT 3.17.2-8** Project sponsors are encouraged to build or fund a major transit stop within or near the development.

- ✓ **TT 3.17.2-9** Transit agencies are encouraged to continue to provide public transit incentives such as free or low-cost monthly transit passes to employees, or free ride areas to residents and customers.

- ✓ **TT 3.17.2-10** Local jurisdictions and project sponsors are encouraged to incorporate bicycle lanes, routes and facilities into street systems, new subdivisions, and large developments.

- ✓ **TT 3.17.2-11** Local jurisdictions are encouraged to require amenities for non-motorized transportation, such as secure and convenient bicycle parking.

- ✓ **TT 3.17.2-12** Local jurisdictions are encouraged to ensure that the project enhances, and does not disrupt or create barriers to, non-motorized transportation.

- ✓ **TT 3.17.2-13** Local jurisdictions are encouraged to connect parks and open space through shared pedestrian/bike paths and trails to encourage walking and bicycling.

- ✓ **TT 3.17.2-14** Local jurisdictions are encouraged to create bicycle lanes and walking paths directed to the location of schools, parks, and other destination points.

- ✓ **TT 3.17.2-15** Local jurisdictions are encouraged to work with the school districts to improve pedestrian and bike access to schools and to restore or expand school bus service using lower-emitting vehicles.

- ✓ **TT 3.17.2-16** Local jurisdictions and transit agencies are encouraged to provide information on alternative transportation options for consumers, residents, tenants, and employees to reduce transportation-related emissions.

- ✓ **TT 3.17.2-17** Project Selection: Local jurisdictions are encouraged to give priority to transportation projects that would contribute to a reduction in vehicle miles traveled per capita, while maintaining economic vitality and sustainability.

- ✓ **TT 3.17.2-18** System Interconnectivity: MCAG, in coordination with local jurisdictions are encouraged to create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car sharing, bicycling, and walking, by incorporating the following:
  - ➢ Provide transportation centers that are multi-modal to allow transportation modes to intersect;
  - ➢ Provide adequate and affordable public transportation choices, including expanded bus routes and service, as well as other transit choices such as shuttles;
  - ➢ To the extent feasible, extend service and hours of operation to underserved arterials and population centers or destinations such as colleges;
  - ➢ Focus transit resources on high-volume corridors and high-boarding destinations such as colleges, employment centers and regional destinations;
  - ➢ Coordinate schedules and routes across service lines with neighboring transit authorities;
  - ➢ Provide safe and convenient access for pedestrians and bicyclists to, across, and along major transit priority streets;
  - ➢ Use park-and-ride facilities to access transit stations.

- ✓ **TT 3.17.2-19** Transit System Infrastructure: Local jurisdictions are encouraged to upgrade and maintain transit system infrastructure to enhance public use, including:
  - ➢ Provide transit stops and bus lanes that are safe, convenient, clean, and efficient;
  - ➢ Provide transit stops that have clearly marked street-level designation, and are accessible;
  - ➢ Provide transit stops that are safe, sheltered, benches are clean, and lighting is adequate;

- Place transit stations along transit corridors within mixed-use or transit-oriented development areas at intervals of three to four blocks, or no less than one-half mile.

✓ **TT 3.17.2-20** Customer Service: Transit agencies are encouraged to enhance customer service and system ease-of-use, including:
- Continue to develop the Regional Pass system to reduce the number of different passes and tickets required of system users;
- Expand "Smart Bus" technology, using GPS and electronic displays at transit stops to provide customers with "real-time" arrival and departure time information (and to allow the system operator to respond more quickly and effectively to disruptions in service);
- Improve and maintain the on-line trip-planning program.
- Before funding transportation improvements that increase roadway capacity and VMT, evaluate the feasibility and effectiveness of funding projects that support alternative modes of transportation and reduce VMT, including transit, and bicycle and pedestrian access.

✓ **TT 3.17.2-21** Local jurisdictions are encouraged to monitor traffic and congestion to determine when and where new transportation facilities are needed in order to increase access and efficiency.

✓ **TT 3.17.2-22** HOV Lanes: MCAG can and should encourage Caltrans to construct high-occupancy vehicle (HOV) lanes or similar mechanisms on State Highways whenever necessary to relieve congestion and reduce emissions.

✓ **TT 3.17.2-23** Ride-share Programs: MCAG will continue to support ridesharing through dibs, and local jurisdictions are encouraged to promote ride sharing programs as well, including:
- Designate a certain percentage of parking spaces for ride-sharing vehicles;
- Designate adequate passenger loading, unloading, and waiting areas for ride-sharing vehicles;
- Provide a web site or message board for coordinating shared rides;
- Hire or designate a rideshare coordinator to develop and implement ridesharing programs.

✓ **TT 3.17.2-24** Employer-based Trip Reduction: Local jurisdictions are encouraged to support voluntary, employer-based trip reduction programs, including:
- Provide assistance to regional and local ridesharing organizations;
- Advocate for legislation to maintain and expand incentives for employer ridesharing programs;
- Require the development of Transportation Management Associations for large employers and commercial/ industrial complexes;
- Provide public recognition of effective programs through awards, top ten lists, and other mechanisms.

✓ **TT 3.17.2-25** Local Area Shuttles: Transit agencies are encouraged to utilize shuttles to serve neighborhoods, employment centers and major destinations.

✓ **TT 3.17.2-26** Transit agencies are encouraged to create a free or low-cost local area bus service that includes a fixed route to popular tourist destinations or shopping and business centers.

- ✓ **TT 3.17.2-27** Local jurisdictions are encouraged to support bicycle use as a mode of transportation by enhancing infrastructure to accommodate bicycles and riders and providing incentives.

- ✓ **TT 3.17.2-28** Development Standards for Bicycles: Local jurisdictions are encouraged to establish standards for new development and redevelopment projects to support bicycle use, including:
  - Amending the Development Code to include standards for safe pedestrian and bicyclist accommodations, by incorporating the following:
    - "Complete Streets" policies that foster equal access by all users in the roadway design, wherever feasible;
    - Bicycle and pedestrian access internally and in connection to other areas through easements;
    - Safe access to public transportation and other non-motorized uses through construction of dedicated paths;
    - Safe road crossings at major intersections, especially for school children and seniors;
    - Adequate, convenient, and secure bike parking at public and private facilities and destinations in all urban areas;
    - Street standards will include provisions for bicycle parking within the public right of way.

- ✓ **TT 3.17.2-29** Local jurisdictions are encouraged to incorporate bicycle facilities, as appropriate in the new land use, including:
  - Construction of weatherproof bicycle facilities where feasible, and at a minimum, bicycle racks or covered, secure parking near the building entrances;
  - Encourage the development of bicycle stations at intermodal hubs.
  - Conduct a connectivity analysis of the existing bikeway network to identify gaps and prioritize bikeway development where gaps exist.

- ✓ **TT 3.17.2-30** Bicycle and Pedestrian Trails: Local jurisdictions are encouraged to establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel and will provide bike racks along these trails at secure, lighted locations.
- ✓ **TT 3.17.2-31** Bicycle Safety Program: Local jurisdictions are encouraged to develop and implement a bicycle safety educational program to teach drivers and riders the laws, riding protocols, routes, safety tips, and emergency maneuvers.

- ✓ **TT 3.17.2-32** Bicycle and Pedestrian Project Funding: Local jurisdictions are encouraged to pursue enhanced funding for bicycle and pedestrian facilities and access projects, including, as appropriate:
  - Apply for regional, State, and federal grants for bicycle and pedestrian infrastructure projects;
  - Update traffic impact fee programs to include VMT or establish new VMT mitigation fee programs to help fund future bicycle and pedestrian facilities and/or future transit infrastructure/routes.
  - Use existing revenues, such as State gas tax subventions, sales tax funds, and general fund monies for projects to enhance bicycle use and walking for transportation.

- ✓ **TT 3.17.2-33** Bicycle Parking: Local jurisdictions are encouraged to adopt bicycle parking standards that ensure sufficient bicycle parking.

- ✓ **TT 3.17.2-34** Pedestrian and Bicycle Promotion: Local jurisdictions are encouraged to work with local community groups and downtown business associations to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation.

- ✓ **TT 3.17.2-35** Bicycle Transportation Support: Local jurisdictions are encouraged to promote and support the use of bicycles as transportation.

- ✓ **TT 3.17.2-36** Transit Access to Municipal Facilities: Transit agencies can and should provide services to municipal facilities.

Significance After Mitigation

The mitigation measures would require implementing agencies to avoid or mitigate impacts to all types of transportation facilities (multi-modal). Although the VMT reduction that could be achieved be implementation of the recommended mitigation measures is unknown and would be difficult to calculate, it is clear that MCAG does not have land use authority, nor does it have the ability to design and construct transportation improvement projects and future land use developments included in the 2022 RTP/SCS or require local implementing agencies to adopt the above mitigation measures. The responsibility to determine and adopt mitigation and approve land use development rests with the local jurisdictions and the responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies. Therefore, for the purposes of this program-level review, the impact is considered significant and unavoidable.

Impact 3.17.3 – Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

While the 2022 RTP/SCS will not directly result in increased hazards due to design feature (e.g., sharp curves or dangerous intersections) or increase conflicts between incompatible uses (e.g., farm equipment and other vehicular traffic), measures should be implemented to ensure that traffic hazards are minimized in the design of the individual transportation projects included in the RTP. Land use development in urban areas of Merced County will increase the number of residents in close proximity to public transit. It will also increase opportunities for walking and biking, thereby making it necessary that multi-modal facilities be designed to enhance the safety of these users.

Mitigation Measures

The implementing agency would be responsible for developing and ensuring adherence to necessary mitigation measures. MCAG is not an implementing agency and does not have the ability to design and construct transportation improvement projects included in the RTP/SCS. The responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies.

To address related impacts and to support policies contained in the 2022 RTP/SCS, the following additional mitigation measures are recommended.

- ✓ **TT 3.17.3-1** Implementing agencies should consider safety an objective in the design of RTP projects, and should plan to avoid, improve, or mitigate safety impacts in the course of project-level environmental review.

- ✓ **TT 3.17.3-2** MCAG shall conduct a forum where policymakers can be educated and can develop consensus on regional transportation safety and security policies.

- ✓ **TT 3.17.3-3** MCAG shall work with local officials to assist with implementation of regional transportation safety and security policies.

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 impacts that substantially increase hazards due to a design feature or incompatible uses, 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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce impacts identified.

Impact 3.17.4 – Result in inadequate emergency access.

Congestion is expected to worsen between now and 2046 which could adversely impact emergency access. While the 2022 RTP/SCS would generally enhance mobility and access to destinations (including access for emergency vehicles) as compared to the No Project Alternative, measures should be implemented to maintain adequate emergency access in the design of RTP projects. Before 2022 RTP projects are implemented by local jurisdictions, all projects will undergo additional environmental analysis, as applicable and appropriate, that will include evaluation of impacts by emergency and public services. The implementing agencies will use these to ensure adequate access in the design of individual RTP projects. During emergencies, emergency vehicles demand (and should be given) right

of way which is signaled through lights and sirens. This will remain the case in the future, allowing emergency vehicles to avoid some congestion.

Mitigation Measures

Implementing agencies should consider emergency access impacts in the design of RTP projects, and should plan to avoid, improve, or mitigate these impacts in the course of project-level environmental review. The implementing agency would be responsible for requiring and ensuring adherence to necessary mitigation measures. MCAG is not an implementing agency and does not have the ability to design and construct transportation improvement projects included in the RTP/SCS. The responsibility to design and construct transportation improvements rests with Caltrans, the local jurisdictions, and other responsible agencies.

To address related impacts and to support policies contained in the 2022 RTP/SCS, the following additional mitigation measures are recommended.

- ✓ **TT 3.17.4-1** MCAG shall support local agencies with the rapid repair of transportation infrastructure in the event of an emergency. This will be accomplished by MCAG, in cooperation with local and State agencies, identifying critical infrastructure needs necessary for: a) emergency responders to enter the region, b) evacuation of affected facilities, and c) restoration of utilities. In addition, MCAG shall establish transportation infrastructure practices that promote and enhance security.

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 impacts that result in inadequate emergency access, 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, MCAG will encourage the implementation of the above-notated mitigation strategies intended to avoid or reduce impacts identified.

Amendment #1

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment #1 are not expected to cause any new or substantial increase in the severity of significant impacts to transportation. The only change in transportation impacts with Amendment #1 in comparison to the 2022 RTP/SCS is a decrease in regional vehicle miles traveled (VMT) resulting from the extension of the Altamont Corridor Express (ACE) passenger rail service to Merced. Amendment #1 also includes

changes to the phasing of several roadway improvement projects, but this does not change the VMT results.

The changes in the transportation network in Amendment #1 have been analyzed using MCAG's regional transportation demand model process and the results are shown in Table 3-84. VMT/capita in the horizon year of 2046 is expected to decrease from 25.74 with the 2022 RTP/SCS to 25.71 with Amendment #1.

It should be noted that, based on information provided by MCAG's regional transportation demand modeling process, it is estimated that the extension of the ACE passenger rail service to Merced would reduce overall VMT in the region by 12,514 per day. Considering the results shown in Table 3-84, implementation of the 2022 RTP/SCS with Amendment #1 would decrease 2046 daily VMT from 9,332,225 with the 2022 RTP/SCS to 9,319,711 with Amendment #1.

7.17 Wildfire

The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are not expected to cause any new or a substantial increase in the severity of significant impacts to wildfire beyond those already identified in the 2022 RTP/SCS PEIR. The 2022 RTP/SCS PEIR analyzed potential impacts to wildfires that could occur upon implementation of the 2022-2046 RTP/SCS. The 2022 RTP/SCS PEIR concluded that the Plan would result in significant impacts and significant cumulative impacts, including substantial induced wildfires in areas adjacent to transit, displacement of existing businesses and homes, separation of residences from community facilities and services and impacts on vacant natural lands. The 2022 RTP/SCS PEIR also concluded that the plan would result in indirect significant impacts, including increased wildfires that may occur due to the transportation investments and land use policies identified in the 2022 RTP/SCS (reference the 2022 RTP/SCS PEIR, pages 3-492 through 3-497). Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency of each project. The proposed changes stated in Amendment No.1, would not cause any wildfires, nor would it affect wildfires. As such, the analysis in the previously certified 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. Therefore, incorporation of the proposed changes to the Project List would not result in any new significant impacts to wildfires, or a substantial increase in the severity of impacts to wildfires beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

8. COMPARISON OF ALTERNATIVES

The proposed changes to the Project List identified in the 2022 RTP/SCS Amendment No.1 would not significantly change the comparison of alternatives in the 2022 RTP/SCS PEIR. Potential impacts from the proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 are anticipated to be within the scope of the programmatic-level comparison among the alternatives already considered in the 2022 RTP/SCS PEIR:

- ✓ No Project Alternative
- ✓ Alternative Scenario 1 – Baseline
- ✓ Alternative Scenario 2 – Conserve Merced County
- ✓ Preferred Project - Alternative Scenario 3 – Conserve and Connect Merced County

The Alternatives Chapter (Chapter 4) of the previously certified 2022 RTP/SCS PEIR adequately addresses the range of alternatives to the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the programmatic level. Incorporation of the proposed projects identified in the 2022 RTP/SCS Amendment No.1 would not require comparison of any new alternatives or alternatives which are considerably different from or inconsistent with those already analyzed in the 2022 RTP/SCS PEIR. Therefore, no further comparison is required at the programmatic level.

9. OTHER CEQA CONSIDERATIONS

Unavoidable and irreversible impacts from inclusion of the proposed changes to the Project List identified in the 2022 RTP/SCS Amendment No.1 are reasonably covered by the unavoidable and irreversible impacts previously discussed in the certified 2022 RTP/SCS PEIR. At the programmatic level, any region-wide growth inducing impacts from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) are expected to be approximately equivalent to those previously disclosed in the 2022 RTP/SCS PEIR (reference the 2022 RTP/SCS PEIR, pages _____). The proposed changes to the 2022 RTP/SCS Project List identified in the 2022 RTP/SCS Amendment No.1 would not significantly change the scope of the discussion presented in the Cumulative Effects Chapter of the 2022 RTP/SCS PEIR (Chapter 5), which includes an assessment of programmatic level unavoidable impacts, irreversible impacts, growth inducing impacts and cumulative impacts (reference the 2022 RTP/SCS PEIR, pages _____). Overall, the proposed changes to the Project List presented in the 2022 RTP/SCS Amendment No.1 are within the scope of the broad, programmatic-level regionwide impacts identified and disclosed in the 2022 RTP/SCS PEIR. Thus, the 2022 RTP/SCS Amendment No.1 would not be expected to result in any new long-term impacts that have not been analyzed in the previous 2022 RTP/SCS PEIR, or any long-term impacts that are considerably different from or inconsistent with those already analyzed in the previous 2022 RTP/SCS PEIR.

10.FINDINGS

The proposed changes to the Project List do not require revisions to the programmatic, region-wide analysis presented in the previously certified 2022 RTP/SCS PEIR. The proposed changes are not substantial changes on a regional level as those have already been adequately and appropriately analyzed in the 2022 RTP/SCS PEIR. After completing a programmatic environmental assessment of the proposed changes described herein to the Project List, MCAG finds that the proposed changes identified in the 2022 RTP/SCS Amendment No.1 would not result in either new significant environmental effects or a substantial increase in the severity of any previously identified significant effect. Further, MCAG finds that the proposed changes to the Project List identified in the 2022 RTP/SCS Amendment No.1 do not require any new mitigation measures or alternatives previously unidentified in the 2022 RTP/SCS PEIR, or significantly affect mitigation measures or alternatives

already disclosed in the 2022 RTP/SCS PEIR. As such, MCAG has assessed the proposed changes to the Project List included in 2022 RTP/SCS Amendment No.1 at the programmatic level and finds that inclusion of the proposed changes would be within the range of and consistent with the findings of impacts analysis, mitigation measures and alternatives contained in the 2022 RTP/SCS PEIR, as well as the Findings of Fact and Statement of Overriding Considerations made in connection with the 2022 RTP/SCS. Therefore, a Subsequent or Supplemental EIR is not required and MCAG concludes that this Addendum to the previously certified 2022 RTP/SCS PEIR fulfills the requirements of CEQA.

11. SUMMARY OF ENVIRONMENTAL IMPACTS, MITIGATION MEASURES & MITIGATION MONITORING PROGRAM

Chapter 3 and Chapter 5 of the Draft PEIR and Chapters 2 and 3 in the Final PEIR provide a detailed listing of the environmental impacts, mitigation measures and mitigation monitoring program associated with implementation of the 2022 RTP/SCS. Detailed project level analysis, including project level mitigation measures, will be conducted by the implementing agency for each project. The impacts, mitigation measures and monitoring program associated with changes to the 2022 RTP/SCS as set forth in Amendment No. 1 will not change. Such impacts as documented in the Environmental Issues Areas section of this Addendum PEIR are not expected to cause any new or a substantial increase in the severity of significant impacts to any of the environmental issue areas beyond those already described in the previously certified 2022 RTP/SCS PEIR. The analysis in the 2022 RTP/SCS PEIR adequately addresses the range of impacts that could result from the proposed projects (as revised by the 2022 RTP/SCS Amendment No.1) at the program level. Thus, incorporation of the proposed changes to the Project List, contained in the Amendment No.1, would not result in any new significant impacts to any environmental issue area, or a substantial increase in the severity of impacts to any environmental issue area beyond those programmatically addressed in the 2022 RTP/SCS PEIR.

12. SUMMARY OF OVERRIDING CONSIDERATIONS & UNAVOIDABLE ENVIRONMENTAL IMPACTS

The following section provides a summary of the Statement of Overriding Considerations and Unavoidable Environmental Impacts associated with the 2022 RTP/SCS and approved as part of the 2022 RTP/SCS PEIR process.

12.1 Statement of Overriding Considerations

Based on information set forth in the 2022 RTP/SCS Draft and Final EIR, and these findings of fact, MCAG recognized that approval of the 2022 RTP/SCS, even with implementation of all the feasible mitigation measures, may result in significant effects on the environment. In compliance with CEQA, MCAG found that the unavoidable significant adverse effects of the Project (2022 RTP/SCS) are overridden by the benefits of the Project and the considerations described below and, therefore, made and adopted the following Overriding Considerations:

✓ **Quality of Life**

- The Project is intended to contribute to the quality of life that is experienced and will be experienced by the residents of Merced County.
- The Project is designed to meet the needs of everyday travel for all types of purposes as well as for large regional movements over the long-term. Transportation is closely connected with many other issues, such as air quality, the environment, and land use, health, safety, and economic vitality and the Project contains goals and actions to address these issues.

- The requirement for updates to the RTP every four (4) years, which provides for the identification of transportation modes to address population and employment growth, is required by State Law and sound local planning practice and is an overriding concern.

✓ **Access and Mobility**

- The Project includes many strategies to address both access and mobility and acknowledges that certain major corridors will need major investments in all modes of transportation to maintain and improve both access and mobility for the growth in travel that is occurring.
  - Access: Significant increases are planned for the street and highway, transit, and bicycle, trails, and pedestrian systems in the County. The projects must undergo extensive planning and analysis processes with community involvement.
  - Mobility: The Project includes a slate of projects aimed at reducing the most critical areas of congestion from a regionwide viewpoint. In addition to expanded transit service, which will reduce congestion in particular corridors, mobility projects additional lanes along streets and highways, interchange improvements, maintenance and rehabilitation of the existing system of streets and highways, and other capacity enhancements throughout the region.

- The Project also includes funding for rail consolidation, car and van pools, and local road improvements, including lane additions, intersection improvements, and rehabilitation and maintenance of the existing street and highways system.

✓ **Air Quality**

- The Project includes funding for significant increases in alternative modes of transportation -- public transit, bicycle, pedestrian projects and community design projects -- that will make alternative modes of transportation more attractive.

- While the individual improvement projects will not result in emissions beyond those allowed through the conformity process, , the fact that the Valley continues to be nonattainment for ozone, PM_{10} and $PM_{2.5}$ emissions is an overriding concern.

✓ **Climate Change**

- The Project would result in a 21 percent per capita reduction in greenhouse gas emissions by 2020, and an 18 percent reduction by 2035 – compared with 2005 levels. This would meet the State's mandated reduction targets, which are 10 percent by 2020 and 14 percent by 2035.

✓ **Travel Choices**

- The Project invests significant funding into offering choices of travel mode to future residents. Major increases in, bus, bicycle, and pedestrian modes are envisioned, along with promotion of sharing rides.

- Regional and localized benefits associated with implementation of the 2022 RTP/SCS (reduced vehicular emissions, reduced vehicle miles traveled and improved mobility), that will result from the implementation of planned improvement projects, outweigh the potentially unavoidable impacts associated with individual or localized improvement projects and other projects identified in the Project alternatives. These other alternatives will result in a greater VMT estimates and infeasible transportation projects that will not result in further benefits beyond implementation of the 2022 RTP/SCS.

✓ **Economic Vitality**

- The Project includes major corridor improvements that connect areas around the periphery of the urban core, providing better access to the region's major job center – the City of Merced.

- Investment in road maintenance and rehabilitation is provided, particularly a problem in rural areas where farm-to-market truck travel is important.

✓ **Equity**

- The Project incorporates the priorities of local communities and many of these local projects are paid for from local funds. Major projects of regional concern are located throughout the region as well.

- The Project will provide alternatives -- public transit, bicycle, and pedestrian facilities -- for those who cannot or do not drive. Finally, a large increase in paratransit service (door-to-door

wheelchair-equipped van service) is included for the expected increase in the elderly population over the RTP and SCS period.

- The need to provide choice in the availability of transportation modes for County residents as a means to avoid significant delay and congestion, which may indirectly harm businesses and residents that depend upon a viable transportation system, is an overriding concern.

✓ **Transportation and Land Use**

- Investment in the transportation system will offer opportunities to grow logically and address the interaction between land use and transportation more effectively.

- The requirement for amendments to the RTP every four years, which provides for the identification of transportation modes to address population and employment growth, is required by State Law and sound local planning practice and is an overriding concern.

- The specific need to provide necessary, feasible and sustainable transportation system improvements within the region is an overriding concern.

- Because there is no alternative other than the "No Build," and Project Alternatives 1, 2, or 3 to converting some prime farmland for expansion of the circulation system, the need for such conversion is an overriding concern.

✓ **Funding and Revenue**

- The Project shows revenues available from all sources -- federal, state, and local. The region will continue to receive federal and state funding to program projects through to the Year 2046.

- Overall, the Project provides funding transit operations and improvements, highway, street and road improvements, highway, street and road maintenance and rehabilitation, and for other kinds of improvements (bicycle, pedestrian, community design, etc.).

✓ **Health and Safety**

- Pedestrian and bicycle projects are specifically identified for funding in the 2022 RTP/SCS. Local road and State highway safety-related improvements are also included.

- Regional benefits associated with implementation of the 2022 RTP/SCS (reduced vehicular emissions, reduced congestion, reduced travel time, reduced vehicle miles traveled and

improved mobility), will result from the implementation of planned improvement projects, which outweigh the potentially unavoidable localized impacts to land use development that may result from the projects.

✓ **Environmental Sustainability**

- The Project includes a number of projects and programs that mitigate environmental issues.
- Because there is no alternative other than "No Build," "No Project," and VMT Reduction Alternatives to the loss of some biological, cultural and agricultural resources for expansion of the circulation system, the loss of such resources is an overriding concern.
- The 2022 RTP/SCS balances the need to preserve valuable agricultural and biological resources with the region's need to provide a viable transportation system to accommodate anticipated population and employment growth and the related increased need for employment opportunities and municipal revenue. This planning balance is an overriding concern.
- Implementation of the 2022 RTP/SCS will result in increased unavoidable noise levels as a result of expansion of the planned transportation system, but the specific need to provide necessary, feasible and sustainable transportation system improvements within the region that supports planned growth and development, is an overriding concern.
- Because there is no alternative other than the "No Build" and other Project Alternatives to converting some prime farmland and forestry lands for expansion of the circulation system and to accommodate future development, the need for such conversion is an overriding concern.
- While the individual improvement projects will not result in emissions beyond those allowed through the conformity process, the fact that the Valley continues to be nonattainment for volatile organic compounds, nitrogen oxides, and PM emissions, is an overriding concern.
- Because there is no alternative other than the "No Build" and other Project Alternatives to the loss of some biological resources for expansion of the circulation system and to accommodate future development, the loss of such resources is an overriding concern.
- MCAG has used the best available information to determine whether the 2022 RTP/SCS is consistent with the State's achievement of the AB 32 GHG emission reductions and addresses SB 375 mandates. Implementation of the mitigation measures will assist in the reduction of

per capita VMT levels throughout Merced County, which will assist in meeting the stated goals of AB 32 and requirements set forth in SB 375.

- Because there is no alternative other than the "No Build" and other Project Alternatives to converting some cultural and tribal lands for expansion of the circulation system and to accommodate future development, the need for such conversion is an overriding concern.

- Regional benefits associated with implementation of the 2022 RTP/SCS (reduced vehicular emissions, reduced vehicle miles traveled and improved mobility) will outweigh impacts associated with energy consumption through 2046.

- Because there is no alternative other than the "No Build" and other Project Alternatives to the loss of and impact on geologic, soil, and mineral resources for expansion of the circulation system and to accommodate future development, the loss of such resources is an overriding concern.

- The 2022 RTP/SCS includes projects that may involve the transportation, use, and/or disposal of hazardous materials, particularly the proposed freight rail improvements and other goods movement capacity enhancements, which may result in transport of hazardous goods as well as the use of equipment that contains or uses routine hazardous materials (e.g., diesel fueled equipment), or the transportation of excavated soil and/or groundwater containing contaminants from areas that are identified as being contaminated. The 2022 RTP/SCS will provide for the enhancement of street and highway projects to accommodate the movement of goods and improve the safety of hazardous waste.

- The specific impacts on hydrology and water quality will be evaluated as part of the implementation agencies' project-level environmental review process regarding their proposed individual transportation improvement project(s) and future land use development(s).

- Regional benefits associated with implementation of the 2022 RTP/SCS (reduced vehicular emissions, reduced vehicle miles traveled and improved mobility), will result from the implementation of planned improvement projects, which outweigh the potentially unavoidable localized impacts to land use development that may result from the individual improvement projects.

- Implementation of the 2022 RTP/SCS will result in increased unavoidable noise levels as a result of expansion of the planned transportation system, but the specific need to provide

necessary, feasible and sustainable transportation system improvements within the region that supports planned growth and development, is an overriding concern.

- The 2022 RTP/SCS balances the need to preserve valuable agricultural and biological resources with the region's need to provide a viable transportation system to accommodate anticipated population and employment growth and the related increased need for employment opportunities and municipal revenue. This planning balance is an overriding concern.

- Implementation of the 2022 RTP/SCS would result in positive impacts on public services; however, long-term maintenance of various transportation modes including streets and highways is an overriding concern.

- Regional and localized benefits associated with implementation of the 2022 RTP/SCS (reduced vehicular emissions, reduced congestion, reduced travel time, reduced vehicle miles traveled and improved mobility), that will result from the implementation of planned improvement projects, outweigh the potentially unavoidable impacts associated with individual or localized improvement projects and other projects identified in the Project alternatives. These other alternatives will result in greater VMT and infeasible transportation projects that will not result in further benefits beyond implementation of the 2022 RTP/SCS.

Based on substantial evidence in the public record, MCAG found that, for the reasons set forth above, the economic, social and other consideration of the individual improvement projects outweigh the unavoidable aesthetic, agricultural and forestry resources, air quality, biological resources, climate change, cultural and tribal resources, energy, geology, soils and mineral resources, hazardous materials, hydrology and water quality, land use and planning, noise, population, housing and employment, public utilities, environmental justice, transportation and wildfire impacts identified in the PEIR for the following reasons:

- ✓ The individual improvement projects identified in the 2022 RTP/SCS and in Amendment No. 1 are required to meet travel demand of residents and businesses through to the year 2046
- ✓ The planned transportation improvements will enhance continued economic growth in the region
- ✓ The planned improvements will reduce VMT compared to the other project alternatives
- ✓ Appropriate and achievable mitigation measures have been proposed, which are within MCAG's and its member agencies' jurisdiction to mitigate or avoid the significant environmental effects identified in the PEIR.

13.APPROVALS REQUIRED

This PEIR Addendum only contains changes necessary to make the previous 2022 RTP/SCS PEIR adequate, and the changes made by this PEIR Addendum do not raise important new issues about the significant effects to the environment. This PEIR Addendum need not be circulated for public review but will be posted on the MCAG website. Ultimately, the PEIR Addendum will be included in or attached to the Final EIR.

MCAG must decide whether to certify the PEIR Addendum as the EIR for the 2022 RTP/SCS Amendment No.1, prior to approving the proposed Project.

14. SOURCES OF INFORMATION USED IN PREPARING THE PEIR ADDENDUM

The Final PEIR for the 2022 RTP/SCS is composed of the following documents:

- ✓ MCAG 2022 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), Draft Program Environmental Impact Report (PEIR), June 20, 2022
- ✓ MCAG RTP/SCS, Final PEIR, August 18, 2022
- ✓ 2022 RTP/SCS PEIR Mitigation Monitoring and Reporting Program, and Statement of Overriding Considerations, August 18, 2022
- ✓ Final MCAG 2022 RTP/SCS, August 18, 2022
- ✓ Final Merced County Conformity Analysis, August 18, 2022
- ✓ Final MCAG 2023 Federal Transportation Improvement Program (FTIP)
- ✓ 2022 RTP/SCS Amendment No.1 – February 2023
- ✓ 2022 RTP/SCS Amendment No. 1 Merced County Conformity Analysis – February 2023
- ✓ State of California, Office of Planning and Research, California Environmental Quality Act (CEQA) Guidelines, 2018.

15. LIST OF PREPARERS

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