State Route 99/State Route 120
Interchange Improvement Project

City of Manteca, San Joaquin County, California
District 10-SJ-99/120 (PM 3.1/6.2 PM R5.1/T7.2)
EA 10-1E740 Project ID: 1016000038 SCH # 2019049145

Initial Study Mitigated Negative Declaration



Prepared by the
State of California Department of Transportation
and San Joaquin Council of Governments

August 2019

Caltrans

General Information About This Document

What's in this document:

The California Department of Transportation (Caltrans) has prepared this Initial Study with Mitigated Negative Declaration (IS/MND), which examines the potential environmental impacts of alternatives being considered for the proposed project in San Joaquin County in California. Caltrans is the lead agency for the project under the California Environmental Quality Act (CEQA). The document explains why the project is being proposed, the alternatives being considered for the project, the existing environment that could be affected by the project, potential impacts of each of the alternatives, and proposed avoidance, minimization, and/or mitigation measures.

The Draft Initial Study/Mitigated Negative Declaration was circulated to the public from April 26, 2019 to May 25, 2019. Comment letters were received on the draft document. Responses to the circulated document are shown in Chapter 7 Response to Comments of this document, which has been added since the draft. Vertical lines in the margins of this document indicate content changes that have been made since circulation of the draft document. Minor editorial changes and clarifications are not called out.

For individuals with sensory disabilities, this document can be made available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please write to or call Caltrans, Attn: Jaycee Azevedo, Senior Environmental Planner, California Department of Transportation, 1976 E. Dr. Martin Luther King Jr Boulevard, Stockton, California ; (209) 941-1919 (Voice), or use the California Relay Service 1-800-735-2929 (TTY), 1-800-735-2929 (Voice), or 711.

10-SJ-99/120 (PM 3.1/6.2 PM R5.1/T7.2)
EA 10-1E740/Project ID 1016000038 SCH #2019049145

State Route 99/State Route 120 Interchange
Improvement Project in the City of Manteca

INITIAL STUDY
Mitigated Negative Declaration

Submitted Pursuant to: (State) Division 13, California Public Resources Code

THE STATE OF CALIFORNIA
Department of Transportation
and
San Joaquin Council of Governments

8/22/19
Date

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Mitigated Negative Declaration

Pursuant to: Division 13, Public Resources Code

Project Description

The California Department of Transportation (Caltrans) in conjunction with the San Joaquin Council of Governments (SJCOG) proposes to construct improvements to the State Route 99/State Route 120 interchange in the City of Manteca in San Joaquin County (PM 3.1/6.2; PM R5.1/T7.2). The project will improve traffic congestion and improve operations of the interchange.

Determination

Caltrans has prepared an Initial Study for this project and, following public review, has determined from this study that the project would not have a significant effect on the environment for the following reasons.

The project would have no effect on the coastal zone, wild and scenic rivers, parks/recreational facilities, timberlands, growth, hydrology/floodplain, natural communities, and plant species, land use, state regional, and local plans and programs, and community character and cohesion.

In addition, the project would have less than significant effects to farmlands, relocations/real property acquisition, environmental justice, greenhouse gases, utilities/emergency services, traffic/transportation, visual/aesthetics, cultural resources, geology/soils/seismicity/topography, paleontology, water quality and storm water runoff, hazardous waste/materials, air quality, biological resources, and cumulative impacts.

With the following mitigation measure incorporated, the project would have less than significant effects to noise sensitive receptors:

NOI-2 Construction of noise barrier NB-2 (12-feet tall), as shown in **Figures 2-9** and **2-12**, in Areas C, D, and E, shall occur at commencement of Phase 1A Construction (Construction Year 2023). This barrier shall be constructed at the commencement of Phase 1A construction as to be functional during Phases 1B and 1C of the Project to attenuate operational noise at sensitive receptors once the Project is fully operational (Design Year 2043).

Philip Vallejo
Office Chief
Environmental Management North
California Department of Transportation

8/22/19
Date

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Table of Contents

Table of Contents v
List of Figures vii
List of Tables viii
Chapter 1 Proposed Project 1
1.1 Introduction 1
1.2 Purpose and Need 1
1.2.1 Purpose 1
1.2.2 Need 1
1.3 Project Description 2
1.4 Project Alternatives 9
1.4.1 Build Alternative 10
1.4.2 No-Build (No-Action) Alternative 15
1.4.3 Identification of a Preferred Alternative 19
1.5 Permits and Approvals Needed 19
Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures 21
2.1 Human Environment 23
2.1.1 Land Use 23
2.1.1.1 Existing and Future Land Use 23
2.1.1.2 Consistency with State, Regional, and Local Plans and Programs 27
2.1.2 Farmland 28
2.1.3 Community Impacts 31
2.1.3.1 Relocations and Real Property Acquisition 31
2.1.3.2 Environmental Justice 34
2.1.4 Utilities and Emergency Services 35
2.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities 38
2.1.6 Visual/Aesthetics 74
2.1.7 Cultural Resources 78
2.2 Physical Environment 83
2.2.1 Hazardous Waste and Materials 83
2.2.2 Air Quality 86
2.2.3 Noise (and Vibration) 100
2.3 Biological Environment 141
2.3.1 Wetlands and Other Waters 141
2.3.2 Animal Species 144
2.3.3 Invasive Species 156
Chapter 3 CEQA Evaluation 159
3.1 Determining Significance under CEQA 159
3.2 CEQA Environmental Checklist 160
3.3 Climate Change 208
Chapter 4 Comments and Coordination 231
Chapter 5 List of Preparers 237
Chapter 6 Distribution List 241

Chapter 7 Response to Comments.....243
Appendix A Title VI Policy Statement.....269
Appendix B Summary of Relocation Benefits.....271
Appendix C Avoidance, Minimization and/or Mitigation Summary.....277
Appendix D Species Lists.....289
Appendix E List of Technical Studies Bound Separately.....321

List of Figures

Figure 1-1: Project Vicinity Map 3
Figure 1-2: Project Location Map 5
Figure 1-3: Build Alternative Design 17
Figure 2-1: Existing Land Uses within the Project Vicinity 25
Figure 2-2: Morning and Evening Peak Hour Freeway Level of Service – Existing Year 2017 Conditions 43
Figure 2-3: Morning and Evening Peak Hour Freeway Level of Service – Construction Year 2023 No-Project Conditions 49
Figure 2-4: Morning and Evening Peak Hour Freeway Level of Service – Construction Year 2023 With Phase 1A Project 53
Figure 2-5: Morning and Evening Peak Hour Freeway Level of Service – Interim Year 2033 Phase 1B Project Conditions 57
Figure 2-6: Morning and Evening Peak Hour Freeway Level of Service – Design Year 2043 No Project Conditions 61
Figure 2-7: Morning and Evening Peak Hour Freeway Level of Service – Design Year 2043 With Phase 1A Project Conditions 65
Figure 2-8: Morning and Evening Peak Hour Freeway Level of Service – Design Year 2043 With Ultimate Project Conditions 69
Figure 2-9: Noise Levels of Common Activities 102
Figure 2-10: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2023) 107
Figure 2-11: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2023) 109
Figure 2-12: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2023) 111
Figure 2-13: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2043) 113
Figure 2-14: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2043) 115
Figure 2-15: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2043) 117
Figure 3-1: 2020 Business as Usual (BAU) Emissions Projection 2014 Edition 214
Figure 3-2: Possible Use of Traffic Operation Strategies in Reducing On-Road $C0_2$ Emissions 216
Figure 3-3: Cascade of Uncertainty in Climate Change Simulations 221
Figure 3-4: Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals 224

List of Tables

Table 1-1: Permits, Reviews and Approvals Needed for Project Construction....19
Table 2-1: Farmland Conversion for Alternatives....29
Table 2-2: Parcels Acquired by the Proposed Project....32
Table 2-3: Required Utility Relocation and Modifications....37
Table 2-4: Freeway and Intersection Level of Service Criteria....42
Table 2-5: Intersection Analysis – Existing Morning and Evening Peak Hour Conditions....46
Table 2-6: Intersection Analysis – Construction Year 2023 No-Build and with Project Phase 1A Morning and Evening Peak Hour Conditions....55
Table 2-7: Intersection Analysis – Interim Year 2033 with Phase 1B Project Morning and Evening Peak Hour Conditions....59
Table 2-8: Intersection Analysis Design Year No-Project, with Project Phase 1A, with Ultimate Project Morning/Evening Peak Hour Conditions....71
Table 2-9: San Joaquin Valley Air Pollution Control District Air Quality Plans....89
Table 2-10: State and Federal Attainment Status....91
Table 2-11: Air Quality Concentrations for the Past Five Years Measured at Manteca....92
Table 2-12: Air Quality Concentrations for the Past Five Years Measured at Stockton....93
Table 2-13: Construction Emissions Estimates....95
Table 2-14: Summary of Comparative Emissions Analysis....96
Table 2-15: Summary of Comparative MSAT Emissions Analysis....97
Table 2-16: Noise Abatement Criteria....101
Table 2-17: Summary of Short-Term Measurements....119
Table 2-18: Summary of Long-Term Monitoring Location at LT-1....120
Table 2-19: Construction Equipment Noise....121
Table 2-20: Operational Noise Levels at Modeled Receptor Locations (Construction Year 2023)....123
Table 2-21: Operational Noise Levels at Modeled Receptor Locations (Design Year 2043)....127
Table 2-22: Summary of Abatement Key Information....135
Table 2-23: Impacts of Suitable Habitat for Special-Status Animal Species 151
Table 2-24: Native Species Mix....154
Table 3-1: Agriculturally Zoned Parcels to be Acquired....165
Table 3-2: Modeled Annual CO_2 Emissions and Vehicle Miles Traveled, by Alternative....217
Table 3-3: Average Required Fuel Economy (miles per gallon)....219

Chapter 1 Proposed Project

1.1 Introduction

Caltrans is the lead agency under the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). Caltrans, in conjunction with the San Joaquin Council of Governments (SJCOG), proposes to construct improvements to the existing State Route 99/State Route 120 interchange near the City of Manteca in San Joaquin County. The State Route 99/State Route 120 Interchange Improvement project will herein be referred to as the "project" or the "proposed project" throughout this document.

The proposed project is an improvement on an existing interchange facility. The cost of the project is estimated at $115.3 million. The project is listed in the 2019 Federal Transportation Improvement Program (FTIP) for San Joaquin Council of Governments and is also included in the financially constrained adopted San Joaquin Council of Governments 2018 Regional Transportation Plan/Sustainable Communities Strategy.

1.2 Purpose and Need

1.2.1 Purpose

The purpose of the project is to reduce traffic congestion and improve operations of State Route 99 with the State Route 120 and Austin Road interchanges.

1.2.2 Need

Deficiencies between the State Route 99 and State Route 120 and Austin Road interchanges require improvement to increase the traffic capacity and improve the operation of the roadways and interchanges:

- The eastbound State Route 120 to southbound State Route 99 and the northbound State Route 99 to westbound State Route 120 single-lane connector ramps need to be expanded to two lanes to alleviate backed-up traffic on the mainline freeway lanes during the morning and evening peak hours. These vehicle queues result in traffic congestion and a higher-than-average accident rate due to impatient drivers cutting into the queued travel lane.
- The existing Austin Road overcrossing needs to be removed and replaced with a longer structure because the existing horizontal clearance provides for only three travel lanes in each direction of travel. The restricted

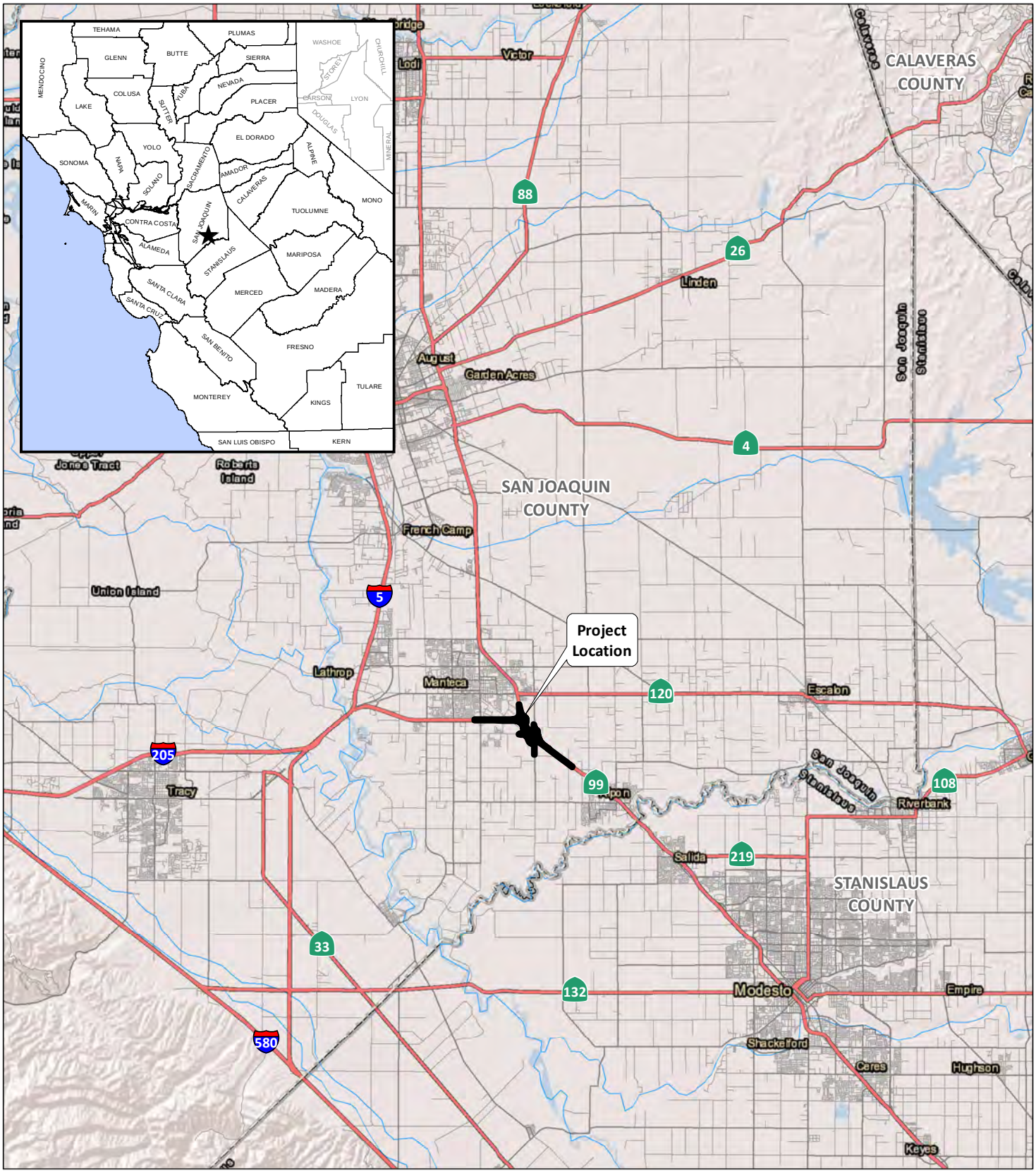
horizontal clearance requires the existing State Route 99 number one lane to be dropped prior to the overcrossing; this creates congestion on State Route 99. The existing overcrossing also will not accommodate the eight-lane section recommended in the State Route 99 Concept Facility in the State Route 99 Transportation Concept Report.

- The southbound exit and northbound entrance ramps for the Austin Road interchange overlap the freeway connector ramps causing merging and congestion problems on State Route 99. These ramps need to be braided because the City of Manteca currently does not support their permanent removal.

1.3 Project Description

This section describes the project and the alternatives developed to meet the purpose and need of the project, as outlined above in Section 1.2, while avoiding or minimizing environmental impacts.

The project lies in the City of Manteca and portions of unincorporated San Joaquin County. **Figure 1-1: Project Vicinity Map** and **Figure 1-2: Project Location Map** show the location of the project on a regional and local basis, respectively.



LEGEND

Project Location

FIGURE 1-1

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Project Vicinity Map

0 2.5 5
Miles

SOURCE: ESRI Imagery (2017)

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LEGEND

Project Boundary

Manteca City Limits

*P.M. (Post Mile)

0 1500 3000

FEET

SOURCE: DigitalGlobe (04/2017); Mapping - San Joaquin County (01/2019)

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FIGURE 1-2

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Project Location Map

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The project area spans about 326.9 acres, and the permanent impact area of the project totals 107.13 acres. Within this area, State Route 99 is a six-lane facility and State Route 120 is a four-lane facility. State Route 99 and State Route 120 serve as the main routes of travel connecting the City of Manteca with other nearby San Joaquin Valley cities as well as cities within the San Francisco Bay area (PM 3.1/6.2; PM R5.1/T7.2).

The project sits in the southern portion of San Joaquin County, about 12 miles south of Stockton and 2.5 miles south of Lathrop, in the eastern/southeastern portion of Manteca. Portions of the project are in the Manteca Sphere of Influence and unincorporated San Joaquin County.

Although distribution, service, and retail employment exists within the area, Manteca is mostly a residential community for the commercial and industrial employment centers west of the Altamont Pass and the San Francisco Bay Area. The City of Manteca had a population of 67,096 residents in 2010 and an estimated population of 81,345 residents as of January 1, 2018 (a roughly 21.24 percent population increase in eight years).

On a local scale, the project is near the eastern/southeastern border of the City of Manteca on State Route 99 between post miles 3.1 and 6.2 and on State Route 120 between post miles R5.1 and T7.2 in San Joaquin County. Most of the project area is in the City of Manteca and Sphere of Influence of the City of Manteca; however, small portions of the project are in unincorporated San Joaquin County. The project area includes the existing State Route 99/State Route 120 connector interchange, runs south along State Route 99 to the State Route 99/Austin Road interchange, west along State Route 120 to the State Route 120/South Main Street interchange, and north along State Route 99 to the State Route 99/East Yosemite/State Route 120 interchange.

Through the Manteca area, State Route 120 is a four-lane freeway with 12-foot-wide lanes, 10-foot-wide outside shoulders, 5-foot-wide inside shoulders, and a 70-foot-wide median. The interchange where State Route 99 meets State Route 120 includes a route break as State Route 120 joins State Route 99 as it jogs north about one mile and continues along to the east of Manteca on East Yosemite Avenue. Therefore, the State Route 99/State Route 120 West interchange is separated from the State Route 99/State Route East interchange by about a mile.

The existing one-lane connectors from State Route 99 northbound to westbound State Route 120 and the eastbound State Route 120 to southbound State Route 99 currently carry more than 2,000 vehicles per hour in the peak periods. Traffic on eastbound State Route 120 currently backs up more than half a mile in the evening peak hour period. Due to this queuing, impatient drivers use the number one lane until the last moment before they merge into the number two lane to exit the freeway. The speed difference

between the number one and number two lanes and the last minute merging to exit to southbound State Route 99 result in eastbound State Route 120 between Main Street and the State Route 99/State Route 120 connector having an accident rate that is more than six times greater than the statewide average. A two-lane exit from eastbound State Route 120 to southbound State Route 99 would reduce the queue length and eliminate the need for all southbound exiting traffic to queue into the number two lane.

Backed-up traffic also occurs on northbound State Route 99 in the morning peak hours because there is only a single lane exit. The accident rate on northbound State Route 99 between the Austin Road overcrossing and the State Route 99/State Route 120 connector is slightly more than double the statewide average.

A two-lane exit from eastbound State Route 120 to southbound State Route 99 would reduce the queue length and eliminate the need for all southbound exiting traffic to back up into the number two lane. A two-lane exit for the State Route 99 northbound connector to westbound State Route 120 would also reduce queue lengths.

Southbound State Route 99 has a non-standard inside lane drop north of the Austin overcrossing that contributes to operational issues because the lane drops just as the high volume of State Route 120 traffic merges onto State Route 99. The project would eliminate the inside lane drop and provide a standard freeway-to-freeway merge that is normally expected.

The State Route 99/Austin Road interchange also contributes to the queuing because of the lane merging and weaving from these vehicles. Though the space between the State Route 99/State Route 120 and the Austin Road interchanges is almost one mile, the effective merge-weave length between both points is only 0.3 mile for northbound and 0.44 mile for southbound movements. These very short merge-weave lengths contribute to the backed-up lines of traffic. For the project, this merge-weave would be eliminated by braiding the ramps so traffic stays separated through that area.

State Route 99 is functionally classified as a principal arterial through its route and is included in the California Freeway/Expressway System. It is in the Interregional Road System classification, making it eligible for Interregional Improvement Program funding as part of the state’s 25 percent share of the State Transportation Improvement Program funds. It is a High Emphasis Focus Route in the Interregional Road System.

State Route 99 is part of the State Network for State Transportation Assistance Act Terminal route system, part of the National Highway System and part of the Strategic Highway Network.

State Route 120 is functionally classified as a principal arterial between Interstate 5 and State Route 99 and is included in the California Freeway/Expressway System. It is in the Interregional Road System classification, making it eligible for Interregional Improvement Program funding as part of the state's 25 percent share of the State Transportation Improvement Program funds. It is a High Emphasis route, but not a Focus route in the Interregional Road System.

State Route 120 is part of the State Network for State Transportation Assistance Act Terminal route system and part of the National Highway System. It is not part of the Strategic Highway Network.

A Transportation Concept Report for State Route 99 in Caltrans District 10 was approved in November 2003. Within San Joaquin County, the existing six-lane freeway was expected to be inadequate for the 20-year planning horizon. The concept facility is an eight-lane freeway with strong consideration of high-occupancy vehicle lanes. The Ultimate Transportation Corridor was also an eight-lane facility. In September 2008, a Corridor System Management Plan for State Route 99 in San Joaquin County was prepared to place greater emphasis on performance assessments and operational strategies that yielded higher benefit-to-cost results. This plan supported the same eight-lane Concept Facility, but recommended the Ultimate Transportation Corridor be reevaluated the next time the Transportation Concept Report is updated.

A Transportation Concept Report for State Route 120 was approved in November 2011. West of State Route 99, the Transportation Concept Report recommended widening State Route 120 from four-lanes to six-lanes by widening into the median. The Ultimate Transportation Corridor recommended State Route 120 be an eight-lane facility, also widened into the median. The Transportation Concept Report was consistent with the current freeway agreement that shows State Route 120 east of State Route 99 extending along Yosemite Avenue as a conventional highway and not being extended east from the interchange as a freeway as was envisioned in the 1950s.

1.4 Project Alternatives

This section describes the project and the different design alternatives that were developed by the Project Development Team to achieve the purpose and need of the project while avoiding and/or minimizing environmental impacts. Two alternatives, the Build Alternative and the No-Build Alternative, are being considered for the project. This section describes the alternatives under consideration.

1.4.1 Build Alternative

The Build Alternative would do the following:

- Add a lane to increase capacity on two connector ramps (eastbound State Route 120 to southbound State Route 99 and northbound State Route 99 to westbound State Route 120)
- Add auxiliary lanes on State Route 99 and State Route 120 to improve merging traffic movements
- Upgrade the existing interchange ramps at Austin Road
- Replace the Austin Road structure over State Route 99 with a four-lane structure over both State Route 99 and Union Pacific Railroad tracks
- Remove the existing at-grade crossing of the Union Pacific Railroad tracks at Austin Road and construct a new connector road from Austin Road to Woodward to Moffat Boulevard and widen the existing Woodward Avenue gated railroad crossing
- Relocate the State Route 99 frontage road along the east side of State Route 99 from Austin Road for about 0.8 mile and install new signing/signals/lighting improvements
- Relocate some existing utility poles, sewer, and water lines

Foundations required for new structures would be driven piles, either steel or concrete. Excavation for structure footings would be up to 5 feet deep. Excavation for new drainage culverts would be up to 6 feet deep. Other roadway excavation would be up to 2 feet deep. No dewatering is expected as part of the project. The project would import fill (extra dirt), and no export would occur.

The project also includes the following design elements:

- Widen the eastbound State Route 120 to southbound State Route 99 connector ramp from one lane to two lanes
- Widen the northbound State Route 99 to westbound State Route 120 connector ramp from one lane to two lanes
- Construct a new structure over State Route 99 to serve eastbound State Route 120 to northbound State Route 99 traffic, and modify the existing structure over State Route 99 to serve westbound State Route 120 traffic
- Add an auxiliary lane in the median in each direction of State Route 120 from Main Street to State Route 99 (this includes widening of the Moffat overhead and Spreckels underpass structures)
- Add an auxiliary lane in each direction on State Route 99 from State Route 120 to about 1 mile south

- Remove the Austin Road overcrossing and replace it with a longer and wider structure spanning State Route 99 and the Union Pacific Railroad tracks (removal consists of removing the structure and the fill located between State Route 99 and Moffat Boulevard)
- Convert the Austin Road on-ramp to northbound State Route 99 and to westbound State Route 120 to a loop ramp that will provide separate traffic movements to State Route 99 and State Route 120
- Replace the southbound exit ramp from State Route 99 to Austin Road with a grade-separated (braided) ramp to eliminate the weaving with State Route 120 merging traffic
- Add a new connector road from Austin Road to Woodward Avenue to Moffat Boulevard, and widen the existing Union Pacific Railroad Woodward Avenue gated crossing
- Relocate the northbound State Route 99 exit ramp to Austin Road to accommodate the loop on-ramp, and relocate the adjacent State Route 99 frontage road for about 0.8 mile

The project would be constructed in Phases (Phase 1A, Phase 1B, and Phase 1C), with Phase 1A being completed by 2023. Funding for Phase 1A is currently available; however, funding for Phases 1B and 1C are not certain at this time. As funding is established and secured, Phases 1B and 1C of the project would be developed.

The Phase 1A portion of the project would do the following:

- Widen the eastbound State Route 120 to southbound State Route 99 connector ramp from one lane to two lanes
- Remove the Austin Road overcrossing, and replace it with a longer structure spanning State Route 99 and the Union Pacific Railroad tracks
- Add a new connecting road from Austin Road to East Woodward Avenue and Moffat Boulevard, and modify the existing Union Pacific Railroad gated crossing at East Woodward Avenue to conform to the new connector road
- Modify the existing northbound Austin Road exit ramp to conform to the higher overcrossing profile grade
- Close the Austin Road northbound entrance and southbound exit ramps on State Route 99. The length of this closure (currently estimated at 9 years) will depend on the availability of funding to commence construction on the Phase 1C portion of the project (discussed below)

The Phase 1B portion of the project would be constructed concurrently or subsequently to the Phase 1A portion of the project and would do the following:

- Widen the northbound State Route 99 to westbound State Route 120 connector ramp from one lane to two lanes
- Convert the existing State Route 99/State Route 120 separation structure to two lanes, and construct a new separation structure to serve the eastbound State Route 120 to northbound State Route 99 connector ramp
- Add an auxiliary lane in the existing median of eastbound State Route 120 from Main Street to State Route 99

The Phase 1C portion of the project would do the following:

- Restore the southbound exit ramp from State Route 99 to Austin Road by constructing a grade-separated braided ramp to eliminate the weaving with State Route 120 merging traffic
- Construct the entrance ramp from Austin Road to northbound State Route 99 and to westbound State Route 120 as a loop ramp that will provide separate traffic movements to State Route 99 and State Route 120
- Relocate the northbound State Route 99 exit ramp to Austin Road to accommodate the loop on-ramp
- Relocate the State Route 99 frontage road for about 0.8 mile
- Add an auxiliary lane in each direction on State Route 99 from State Route 120 to about 1.7 miles south of the Austin Road overhead by shifting the median away from the Union Pacific Railroad right-of-way and relocating the frontage road
- Add an auxiliary lane in the existing median of eastbound State Route 120 from Main Street to State Route 99 to provide a dedicated lane to connect to the new State Route 99/State Route 120 separation structure

Construction of the Build Alternative would start in October 2021 and end in September 2031. Phase 1A would start in October 2021 and end in November 2022; Phase 1B and Phase 1C would start in March 2030 and end in September 2031. The construction schedule for Phases 1B and 1C is an estimate and depends on funding; therefore, the potential exists for a 9-year gap between operation of Phase 1B and construction of Phase 1C.

The project contains many standardized project measures that are used on most, if not all, Caltrans projects and were not developed in response to any specific environmental impact resulting from the project. These standardized measures are described below. Avoidance, Minimization, and/or Mitigation Measures are identified and discussed in more detail in the Environmental Consequences sections of each resource topic in Chapter 2.

CULT-2 If cultural materials are discovered during construction, all earth-moving activity within 60 feet of the find will be diverted until a qualified archaeologist can assess the nature and significance of the find. If the cultural materials are Native American in origin, Native American groups will be contacted.

CULT-3 If human remains are encountered during project construction activities, the project will comply with the requirements of California Health and Safety Code Section 7050.5. There will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of San Joaquin County has determined the manner and cause of any death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his/her authorized representative. At the same time, an archaeologist will be contacted to assess the situation and consult with agencies as appropriate. Project personnel/construction workers will not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendant (MLD) to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. At this time, the person who discovered the remains will contact Ben Elliot, Acting Senior Environmental Planner, Northern San Joaquin Valley Environmental Management Branch, (209) 942-6157, so he may work with the Most Likely Descendant on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code 5097.98 are to be followed as applicable.

GEO-1 A Geotechnical Report will be prepared by the project which will outline required geologic/geotechnical field investigations and laboratory testing that will be performed. The Geotechnical Report will be prepared to obtain site-specific data appropriate to design Phases 1A, 1B, and 1C of the proposed project.

WQ-1 Preparation and implementation of construction site temporary best management practices by the project will comply with the provisions of the Caltrans Statewide National Pollutant Discharge Elimination System Permit and any subsequent permit as they relate to construction activities for the project. These best management practices will include submission of a Notice of Intention to the Central Valley Regional Water Quality

Control Board at least 30 days before the start of construction and submission of a Notice of Termination to the Regional Water Quality Control Board upon completion of construction and stabilization of the project site. The temporary best management practices will be installed by the project prior to any construction operations and will be in place for the duration of the contract. The removal of these best management practices by the project will be the final operation, along with the project site cleanup.

WQ-2 The project will follow Design Pollution Prevention and Treatment Control best management practices for the project in accordance with the procedures outlines in the Stormwater Quality Handbooks, Project Planning and Design Guide. Compliance with Design Pollution Prevention and Treatment Control best management practices will included coordination with the Regional Water Quality Control Board with respect to feasibility, maintenance, and monitoring of Treatment Control best management practices as set forth in Caltrans' Statewide Stormwater Management Plan. A Water Pollution Control Program will need to be prepared by a Qualified Stormwater Pollution Prevention Plan Practitioner.

WQ-3 The project will be required to comply with the provisions specified in Section 13 "Water Pollution Control," and Section 14-11 "Hazardous Waste and Contamination," of the California State Standard Specifications, regarding spill prevention and control measures. All workers will be informed by the project of the importance of preventing spills and appropriate measures to take should a spill occur.

WQ-4 To control sedimentation during and after project implementation, the project will implement best management practices outlined in any authorizations or permits, issued under the authorities of the Clean Water Act that it receives for the project. If best management practices are ineffective, the project will remedy the situation immediately, in consultation with the regulatory and resource agencies.

TRA-1 The project will be required to prepare and implement a Traffic Management Plan to address short-term disruptions in existing circulation patterns during construction; the Traffic Management Plan will identify the locations of temporary detours and signage to facilitate local traffic patterns and through-traffic requirements. The Traffic Management Plan will also provide access plans for affected businesses and residential units that will be impacted by short-term and long-term road closures to

ensure access to uses are still available during construction activities.

Figure 1-3: Build Alternative Design shows the design of the Build Alternative.

1.4.2 No-Build (No-Action) Alternative

The No-Build Alternative would leave the existing interchange as it is. Through the Manteca area, under existing conditions (2018), State Route 120 is a four-lane freeway with 12-foot-wide lanes, 10-foot-wide outside shoulders, 5-foot-wide inside shoulders, and a 70-foot-wide median. East of the State Route 99/State Route 120 East interchange, East Yosemite Avenue continues as a four-lane arterial road with a center turn lane, bicycle lanes, and sidewalks.

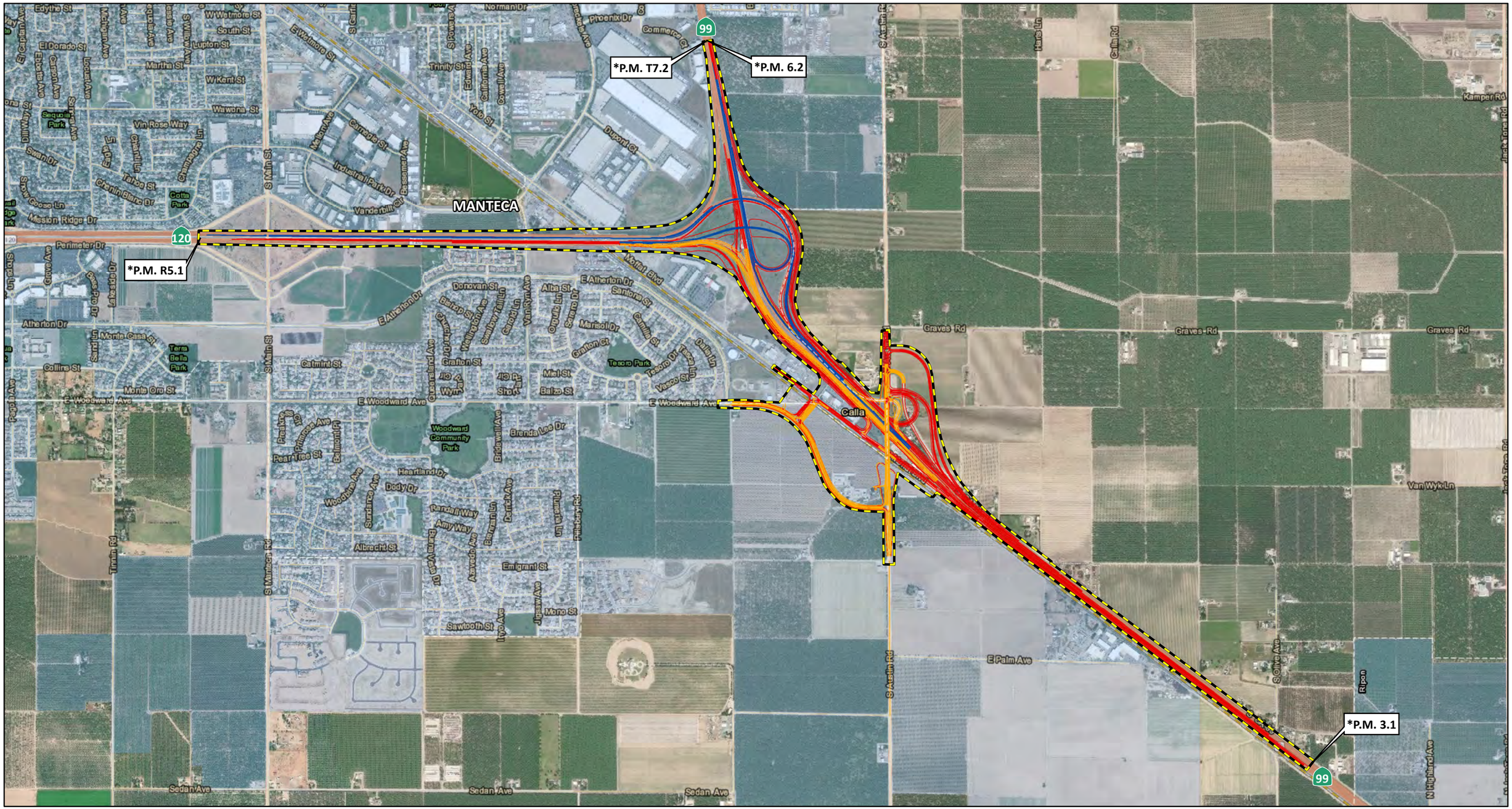
The interchange where State Route 120 meets State Route 99 includes a route break as State Route 120 joins State Route 99 as it jogs north about one mile and continues along to the east of Manteca on East Yosemite Avenue. Therefore, the State Route 99/State Route 120 West interchange is separated from the State Route 99/State Route 120 East interchange by about a mile.

The existing State Route 99/State Route 120 West interchange facility also includes the State Route 99/Austin Road interchange. Austin Road runs north-south to the east of Manteca. The State Route 99/State Route 120 interchange is a trumpet interchange, while the State Route 99/Austin Road interchange is a partial/modified diamond interchange. These two interchanges are separated by about 1,000 feet. Current land uses surrounding the existing interchange include commercial, industrial, residential, and agricultural uses.

Under existing conditions, the northbound State Route 99 to westbound State Route 120 connector operates at level of service (LOS)[1] C/F. Under No-Build Alternative conditions, interchange operations would worsen to level of service D/F by 2023, and level of service F/F by 2043.

[1] The operations of roadways are described with the term “Level of Service” (LOS). LOS is a description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six LOS levels are defined, ranging from LOS A (the best operating conditions) to LOS F (the worst operating conditions). LOS E represents “at-capacity” operations when volumes exceed capacity, stop-and-go conditions result and operations are designated as LOS F.

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LEGEND

- Project Boundary
- Manteca City Limits

*P.M. (Post Mile)

Project Design

- Phase 1a
- Phase 1b
- Phase 1c

0 800 1600
FEET

SOURCE: DigitalGlobe (04/2017); Project Design - Mark Thomas (02/2019); Mapping - San Joaquin County (01/2019)

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FIGURE 1-3

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, PM 3.10/6.20
EA 10-1E740

Build Alternative Design

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1.4.3 Identification of a Preferred Alternative

Caltrans has identified the Build Alternative as the preferred alternative because it has the greatest project benefits with regard to any associated impacts. The Build Alternative will reduce traffic congestion and improve operations of State Route 99 with the State Route 120 and Austin Road interchanges.

Several effects of the No-Build Alternative can be reasonably expected to occur in the foreseeable future. Increasing traffic demand associated with continued and planned commercial and industrial growth in the City of Manteca would continue to degrade levels of service at project area intersections, which would lead to worsening air quality due to idling at on- and off-ramps and intersections. Also, the No-Build Alternative could potentially lead to greater costs and cumulative environmental impacts due to maintenance and piecemeal improvements.

The purpose of the project is to correct operational deficiencies and provide congestion relief. The No-Build Alternative does not meet the purpose and need of the project because it would result in lower level of service than under existing conditions and would result in operational deficiencies.

1.5 Permits and Approvals Needed

Table 1-1: Permits, Reviews and Approvals Needed for Project Construction shows the permits, reviews and approvals that would be required for project construction.

Table 1-1: Permits, Reviews and Approvals Needed for Project Construction

Agency	Permit/Approval	Status
Central Valley Regional Water Quality Control Board	Water Discharge Requirements (WDRs)	Prior to construction
State Office of Historic Preservation	National Register of Historic Places Eligible Listing Concurrence	Concurrence received January 10, 2019

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Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the project would have on the human, physical, and biological environments in the project area. It describes the existing environment that could be affected by the project and proposed avoidance, minimization, and/or mitigation measures. Any direct impacts are included in the general impacts analyses and discussions that follow.

As part of the scoping and environmental analysis done for the project, the following environmental issues were considered, but no adverse impacts were identified. So, there is no further discussion of these issues in this document.

- **Coastal Zone:** The project site is not located in the Coastal Zone. As a result, the project would not impact the Coastal Zone.
- **Wild and Scenic Rivers:** The project site is not located near a Wild and Scenic River. As a result, the project would not impact Wild and Scenic Rivers.
- **Parks and Recreational Facilities:** A few parks, including Tesoro Park and Manteca BMX Park, sit near the project site, but direct and indirect impacts to such facilities would not occur because most project work will occur within the existing right-of-way. Parcels that would be acquired are not occupied by parks and recreational facilities, so these facilities would not be impacted. In addition, there are no potential Section 4(f) properties in the project vicinity.
- **Timberlands:** The project site is not located in an area where timberland production occurs, and it is not on land that is zoned for timberland or forestland.
- **Growth:** The project includes improvements to an existing connector/ interchange between State Route 99 and State Route 120. The improvements that will occur under the project are being completed to accommodate existing traffic and safety concerns as well as planned future growth in the City of Manteca and surrounding regional areas. Implementation of the project itself would not influence direct or indirect growth as it is an improvement project to accommodate future planned growth and improve existing operations. (*Final Community Impact Assessment Checklist, February 2019*).

- **Community Character and Cohesion:** The project improvements will occur on an existing connector/interchange between State Route 99 and State Route 120. The proposed project will fully and partially acquire parcels that are designated as “Business Industrial Park”, “Urban Reserve”, or “Heavy Industrial”. Implementation of the project would not substantially alter community character and cohesion due to the fact that 1) “Urban Reserve”, “Business Industrial Park”, “General Commercial” land uses would still be the dominant land uses adjacent to the State Route 99/120 connector after project implementation; and 2) the project would not substantially alter the location of the existing State Route 99/120 connector/interchange. The project would not affect the community character and cohesion of the area.
- **Hydrology and Floodplain:** According to the Federal Emergency Management Agency maps, the project lies in the Zone X Area of Minimal Flood Hazard and therefore is not located within the 100-year floodplain. Since the project is not within or near enough to affect a floodplain, no floodplain encroachment impacts or increases to base flood elevations would occur.
- **Water Quality and Storm Water Runoff:** The project site does not include any water features with connectivity to surface water resources in the project vicinity. The project will include three types of Best Management Practices (BMPs): Construction Site BMPs, Design Pollution BMPs and Maintenance BMPs. The project will have a disturbed area in excess of one acre. The existing Design Pollution Prevention infiltration structures and retention basins are being modified to address changes to site geometry and an increase in the impermeable surfaces. Infiltration retention basins are designed with the capacity to contain runoff generated by two 10-year frequency, 24-hour duration storms. All stormwater occurring within Caltrans right-of-way watershed will be retained within the project limits in which no treatment BMPs will be required. The project is not required to implement treatment BMPs as there are no waterbodies within the project limits. No impacts to water quality and from storm water runoff would occur.
- **Geology, Soils, Seismicity, Topography:** No known active faults pass through or near the project alignment, so the potential for surface fault rupture that could directly affect the project improvements is considered negligible. The project would be developed to earthquake standards and codes to reduce potential damage during seismic events. *(Preliminary Geotechnical Report, December 13, 2017)*.
- **Paleontology:** Although excavation may be required, development of the proposed Project is unlikely to impact scientific significant paleontological resources and no further paleontological studies are needed. *(Paleontological Identification Report/Paleontological Evaluation Report, F February 2018)*.

- **Natural Communities:** No natural communities occur within the project footprint. Therefore, no impacts are expected to occur to natural communities (*Natural Environment Study, November 2018)*.
- **Plant Species:** No special-status plant species are expected to occur within the project footprint. Therefore, no impacts to special-status plant species are expected to occur (*Natural Environment Study, November 2018)*.
- **Threatened and Endangered Species:** The following special status wildlife species has the potential to occur within the project footprint: Pallid Bat (*Antrozous pallidus*) (California Species of Special Concern); Cooper's hawk (*Accipiter cooperii*) (California State Watch List for species protected under the California Fish and Game Code); Burrowing owl (*Athene cunicularia*) (California Species of Special Concern); Aleutian cackling goose (*Branta hutchinsii leucopareia*) (federally delisted species); Swainson's hawk (*Buteo swainsoni*) (California State Threatened Species); White-tailed kite (*Elanus leucurus*) (Fully Protected under California Fish and Game Code [CFGC]); California horned lark (*Eremophila alpestris actia*) (California Watch List); Merlin (*Falco columbarius*) (California Watch List); and, Loggerhead shrike (*Lanius ludovicianus*)(California Species of Special Concern). None of these species are protected under the federal regulations and no impacts are expected to occur (*Natural Environment Study, November 2018)*.

2.1 Human Environment

2.1.1 Land Use

2.1.1.1 Existing and Future Land Use

Affected Environment

The *Final Community Impact Assessment Checklist* (as listed in the List of Technical Studies at the end of this document), dated February 2019, contributed to the information and analysis in this section.

The City of Manteca adopted a General Plan in October 2003, creating a land use blueprint for long-term growth through 2023. The City of Manteca is now updating its General Plan and will publish the General Plan Update for public review and comment in the summer 2019. The project site, within the boundary of the City of Manteca, consists of land designated as High Density Residential, Medium Density Residential, Park, Business Industrial Park, Low Density Residential, General Commercial, Heavy Industrial, Agriculture/Urban Reserve, and Commercial/Mixed Use, based on the 2003 Manteca General Plan.

San Joaquin County adopted a General Plan in December 2016, creating a land use blueprint for long-term growth in unincorporated portions of the county through 2035. Land in the project area, which is under the jurisdiction of San Joaquin County, is designated as Commercial/General, Residential/Low Density, Agriculture/Urban Reserve, and Industrial/General **Figure 2-1: Existing Land Uses in the Project Vicinity** shows the existing City of Manteca and San Joaquin County land uses in the project vicinity.

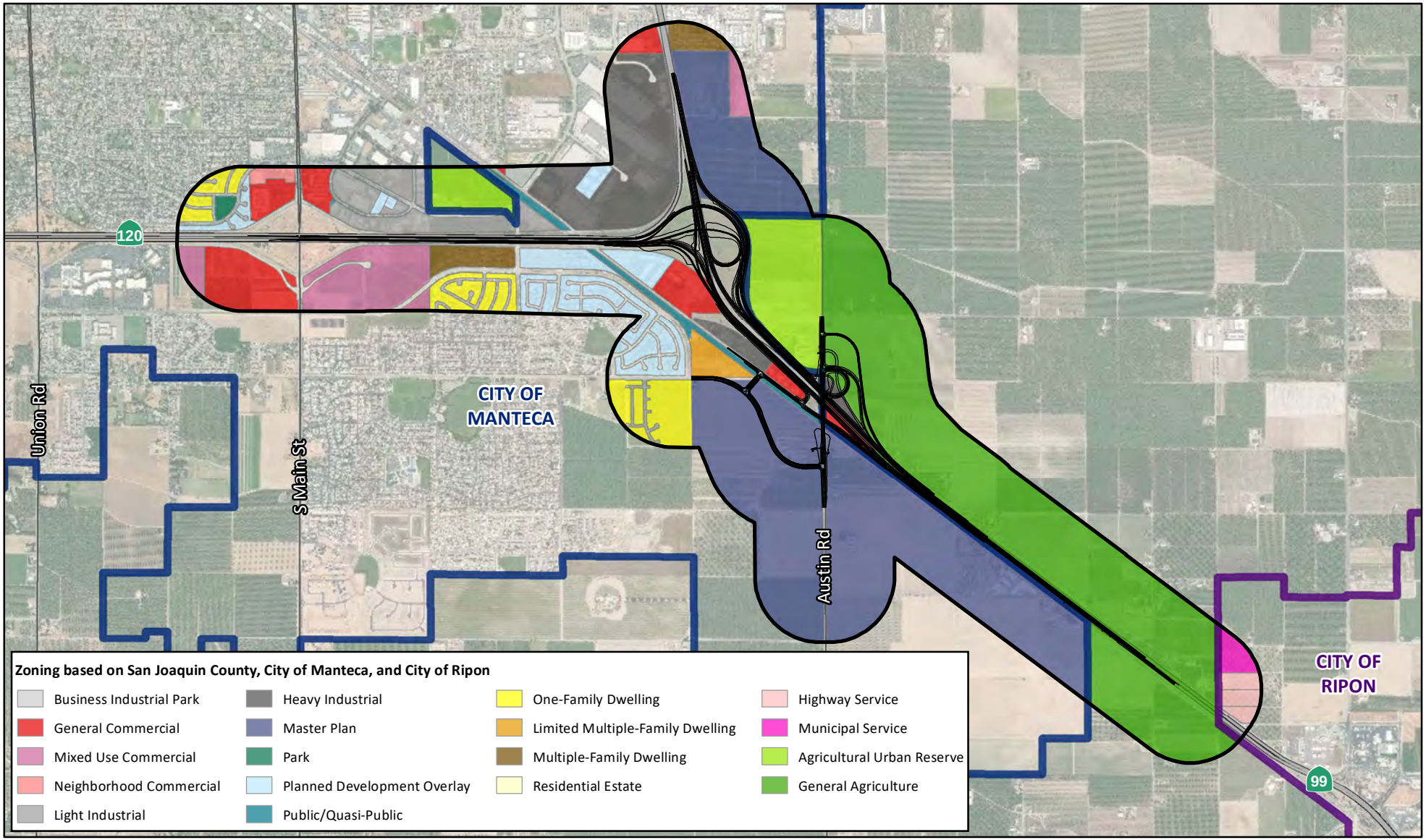
The project site is characterized by relatively flat topography, with little to no change in elevation (elevation between 36 to 78 feet above mean sea level). Land uses in the project vicinity under the jurisdiction of San Joaquin County consist mostly of Urban Reserve Agriculture and General Agriculture. Parcels within the project vicinity are occupied by agricultural uses, commercial and industrial uses, and vacant parcels. Residential uses (single-family and multi-family residential units) are south of the project site in the Woodside neighborhood.

Environmental Consequences

The project would be implemented on an existing facility, and most improvements would occur within the existing right-of-way. The project would partially and fully acquire parcels that are currently designated as “Business Industrial Park,” “Urban Reserve,” and “Heavy Industrial” (please refer to Section 2.1.3.2 below for more information on parcel acquisition for the project). Once acquired, these parcels would be redesignated as transportation-related right-of-way and the change would be processed through local (City of Manteca and County of San Joaquin) land use redesignation requirements. Even with these acquisitions, the land use designations around the project area would continue to be dominated by “Business Industrial Park,” “Urban Reserve,” and “Heavy Industrial.”

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required for project effects involving existing and future land use.



Caltrans

LEGEND

- Project Design
- 0.25-Mile Buffer
- City of Manteca
- City of Ripon

N

0 1400 2800

FEET

FIGURE 2-1

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Existing Land Uses in the Project Vicinity

SOURCE: DigitalGlobe (04/2017); Zoning - San Joaquin County (01/2019); City of Manteca (02/2019); City of Ripon General Plan 2040 (04/2010)

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2.1.1.2 Consistency with State, Regional, and Local Plans and Programs

Affected Environment

The *Final Community Impact Assessment Checklist* (as listed in the List of Technical Studies at the end of this document), dated February 2019, contributed to the information and analysis in this section.

The project sits within the City of Manteca and unincorporated portions of San Joaquin County. The City of Manteca General Plan and the County of San Joaquin General Plan were reviewed to determine project consistency. Both have included the proposed project in their growth plans and land use designations *(Draft Community Impact Assessment Checklist, December 2018)*. The project falls within the jurisdiction of the San Joaquin Multi-Species Habitat Conservation and Open Space Plan.

Environmental Consequences

The City of Manteca, San Joaquin County, and the San Joaquin Council of Governments included the project in their land use plans and planning documents. This signified that an improved State Route 99/State Route 120 connector was needed to alleviate existing and future traffic congestion due to an increase in anticipated/planned development trends; it also signified an improved connector was needed to improve vehicle circulation and safety conditions.

The project is a planned improvement to the State Route 99/State Route 120 connector that has been programmed since 2017. The project is listed in the 2019 Federal Transportation Improvement Program (FTIP) for San Joaquin Council of Governments and is also included in the financially constrained adopted San Joaquin Council of Governments 2018 Regional Transportation Plan/Sustainable Communities Strategy. The project was evaluated under the San Joaquin Multi-Species Habitat Conservation and Open Space Plan; however, it was determined that the plan would not expedite or reduce costs of the project. Therefore, the San Joaquin Multi-Species Habitat Conservation and Open Space Plan would not be used. The project will be designed and developed with consistency to local and regional plans and will also be consistent with improvement requirements for State facilities maintained by Caltrans.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required for project effects involving consistency with state, regional, and local plans and programs.

2.1.2 Farmland

Regulatory Setting

The National Environmental Policy Act and the Farmland Protection Policy Act (7 U.S. Code 4201-4209; and its regulations, 7 Code of Federal Regulations Part 658) require federal agencies, such as the Federal Highway Administration, to coordinate with the Natural Resources Conservation Service if their activities may irreversibly convert farmland (directly or indirectly) to nonagricultural use. For purposes of the Farmland Protection Policy Act, farmland includes prime farmland, unique farmland, and land of statewide or local importance.

The California Environmental Quality Act requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses.

Affected Environment

The *Final Community Impact Assessment Checklist* (as listed in the List of Technical Studies at the end of this document), dated February 2019, contributed to the information and analysis in this section. Appendix D: Farmland Conversion Impact Rating of the *Final Community Impact Assessment Checklist* also contributed farmland loss scoring information for the project.

The Farmland Protection Policy Act (FPPA) sets criteria to identify and minimize impacts of the conversion of farmland to nonagricultural uses. Important Farmland is subject to the provisions of the FPPA, which defines Important Farmland as lands identified with soils that are prime farmland, unique farmland, farmland of statewide importance or farmland of local importance.

As of 2016, San Joaquin County had a total Important Farmland inventory of 615,075 acres. Of the 615,075 acres, 381,634 acres were designated as prime farmland; 82,618 acres were designated as farmland of statewide importance; 81,920 acres were designated as unique farmland; and, 68,903 acres were designated as farmland of local importance. As of 2017, the City of Manteca had a total Important Farmland inventory of 4,944.365 acres, which consisted of 1,095.536 acres of prime farmland; 3,278.122 acres of farmland of statewide importance; and, 570.707 acres of farmland of local importance. Important Farmland in the project site totaled 115.29 acres, of which 1.97 acres is designated as prime farmland; 100.12 acres is designated as farmland of statewide importance; and, 13.2 acres is designated as farmland of local importance.

As of 2015, according to the California Department of Conservation, San Joaquin County had a total Williamson Act contracted land inventory of 499,654 acres. As of 2017, the City of Manteca had 21.5137 acres of land under Williamson Act Contract; however, this acreage is currently going through the non-renewal process. There are two parcels within (or partially within) the project site that are currently under Williamson Act contracts (totaling 107.26 acres).

Environmental Consequences

Implementation of the project would result in approximately 48.95 acres of right-of-way conversions, including both agricultural and urban lands. The proposed right-of-way conversions would result in the loss of 0.93 acre of prime farmland, 35.97 acres of farmland of statewide importance, 3.83 acres of farmland of local importance (3.37 acres which are designated confined animal agriculture; considered as farmland of local importance by the County). As such, the project would require the permanent conversion of 40.73 acres of Important Farmland.

Table 2-1: Farmland Conversion for Alternatives summarizes the proposed important farmland conversion for the No Build and Build Alternatives.

Table 2-1: Farmland Conversion for Alternatives

Alternatives	Land Converted (acres)	Important Farmland (acres)	Percent of Farmland in County	Percent of Farmland in City	Farmland Conversion Rating
No Build	0	N/A	N/A	N/A	N/A
Build Alternative	49.01	40.73	0.0066	0.82	136

Source: LSA, April 2019.
Notes: N/A = not applicable

The loss of important farmland due to implementation of the Build Alternative is negligible when compared to the total Important Farmland inventory of the County and City. The 40.73 acre Important Farmland loss represents 0.0066 and 0.82 percent of the total County and City inventory, respectively. Due to the large amount of land currently supporting agricultural production in the City and County, it is not expected that the small amount of Important Farmland acreage converted to non-agricultural uses would affect total agricultural production in the area. To solidify this conclusion, an NRCS-CPA-106 Farmland Conversion Impact Rating for Corridor Type Projects was completed and sent to the Natural Resources Conservation Service for them to complete scoring on the loss of the Important Farmland. The Natural Resources Conservation Service concluded the total points for the loss of the

Important Farmland was 136. Per Section 523.10(B)(i) Land Covered by the Act of Part 523—Farmland Protection Policy Act, “lands that receive a combined score of less than 160 points from the Land Evaluation and Site Assessment criteria” are not required to do anything more under the Farmland Protection Policy Act.

There are two parcels (Assessor’s Parcel Numbers 228-060-018 and 228-060-021) within (or partially within) the project site that are currently under Williamson Act contracts. Parcel 228-060-021 is currently going through the Williamson Act non-renewal process and once this process is complete this parcel would no longer be bound by a Williamson Act contract (the non-renewal process for this parcel commenced in 2012 and the parcel will be out of the contract in 2021). Project implementation would require the acquisition of 8.46 acres of parcel 228-060-018 and 0.37 acre of parcel 228-060-21; potentially affecting the Williamson Act contracts of these parcels.

Because the project would provide congestion relief and operational improvements for local commuters and improved access for local businesses, it can be considered a public improvement. As public entities, Caltrans and the San Joaquin Council of Governments would be able to acquire portions of the parcels under Williamson Act contract without cancelling the contracts. Instead, the contracts for the portions acquired would be nullified, while remaining land in the parcels would continue under Williamson Act contract and effects would be nominal.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimization measures would further reduce any project effects involving farmland:

AG-1 Final design for the project will be coordinated with neighboring property owners and agricultural operators to incorporate design features to maintain access and operation of adjacent agricultural properties.

AG-2 Prior to the commencement of Project construction, the project contractor will reconstruct irrigation ditches and install irrigation pipelines on all agriculture parcels impacted during project construction to ensure proper drainage and irrigation.

AG-3 The project will notify the California Department of Conservation prior to making a decision to acquire property under Williamson Act contracts for a public improvement (required per Government Code §§51290-51295, 51296.6).

2.1.3 Community Impacts

2.1.3.1 Relocations and Real Property Acquisition

Regulatory Setting

The Caltrans Relocation Assistance Program is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, and Title 49 Code of Federal Regulations Part 24. The purpose of the program is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. See **Appendix B** for a summary of the Caltrans Relocation Assistance Program. All relocation services and benefits are administered without regard to race, color, national origin, persons with disabilities, religion, age, or sex. See **Appendix A** for a copy of the Caltrans Title VI Policy Statement.

Affected Environment

The *Relocation Impact Statement prepared for the project* (as listed in the List of Technical Studies at the end of this document), dated September 2018, contributed to the information and analysis in this section.

The study area related to this resource topic consisted of San Joaquin County, the City of Manteca, thirty-three (33) parcels affected by the project, and right-of-way areas to be acquired by Caltrans within the project footprint.

The project site and surrounding area is characterized by relatively flat land that had been used mostly for agriculture in the past but in the last decade has become more urbanized. The project area is a mix of urbanized and semi-rural uses which includes commercial, industrial, residential neighborhoods, and also includes unincorporated San Joaquin County agriculture and large lot residential uses. Caltrans would require right-of-way acquisition totaling 48.95 acres from thirty-three ownership parcels.

Environmental Consequences

A review of the project site was conducted to determine the potential adverse effects related to residential and nonresidential property acquisition and relocation.

The project would result in two full acquisitions of business properties in the project area (one with a residential structure), one other full acquisition of a residential property, and two full acquisitions of government and agency-owned property. In addition to these five full acquisitions, the Build Alternative would also result in 27 partial acquisitions of residential, agricultural, industrial, and commercial properties next to the project area. Most partial acquisitions would require less than 10 percent of the property, but two partial acquisitions would result in full acquisition of the residences. Therefore, the

project would result in six potential displacements (five residential and one commercial). **Table 2-2: Parcels Acquired by Proposed Project** shows potential acquisitions and displacements.

Table 2-2: Parcels Acquired by the Proposed Project

APN	Full Acquisition	Partial Acquisition	Businesses on Parcel	Residence on Parcel	Agriculture on Parcel	Notes
228-020-40		X			X	
228-020-32		X			X	
228-020-37		X			X	
228-020-36	X				X	Agency Owned
228-020-39		X			X	
228-050-02		X			X	
228-050-18		X			X	
228-050-19	X					Agency Owned
228-060-08		X			X	
228-050-17		X				Church
228-050-15		X	X			
228-050-08		X	X			
224-050-35		X				
228-060-17	X		X – Acquisition of Business			Industrial
228-060-16	X		X – Acquisition of Business	X – Acquisition of Residence		Industrial
228-060-15	X			X – Acquisition of Residence		
228-060-18		X			X	
228-060-19		X		X – Acquisition of Residence		
228-060-20		X		X		
228-060-21		X				

APN	Full Acquisition	Partial Acquisition	Businesses on Parcel	Residence on Parcel	Agriculture on Parcel	Notes
228-060-27		X			X	
228-060-28		X			X	
228-060-29		X			X	
226-140-06		X			X	
228-060-24		X		X – Acquisition of Residence		
224-050-16		X		X – Acquisition of Residence		Probable Acquisition
228-060-26		X			X	
224-050-15		X			X	
228-060-25		X			X	
224-050-17		X			X	
224-050-19		X			X	

Source: Mark Thomas, 2017.
Notes: APN = Assessor's Parcel Number

The *Relocation Impact Statement* (September 2018) prepared for the project (listed in the List of Technical Studies at the end of this document) indicates that there is a current supply of residential and commercial vacancies to accommodate required residential and business relocations. As of September 2018, there were 72 active 3 to 5 bedroom homes available on the market to accommodate the residential displacees. Additionally, there were 44 active commercial properties for sale and 17 additional available for lease. The City of Manteca and Caltrans are committed to providing relocation assistance to each residential and business occupant and will reevaluate the supply of residential and commercial vacancies prior to commencement of the parcel acquisition process. In addition, it is the intent of Caltrans that all activities will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required for project effects involving relocations and real property acquisition.

2.1.3.2 Environmental Justice

Regulatory Setting

All projects involving a federal action (funding, permit, or land) must comply with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President William J. Clinton on February 11, 1994. This order directs federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. For 2019, this was $25,750 for a family of four.

All considerations under Title VI of the Civil Rights Act of 1964, and related statutes, have also been included in this project. Caltrans' commitment to upholding the mandates of Title VI is demonstrated by its Title VI Policy Statement signed by the Caltrans Director in Appendix A of this document.

Affected Environment

The *Community Impact Assessment Checklist* (as listed in the List of Technical Studies at the end of this document), dated February 2019, contributed to the information and analysis in this section.

The project sits within the boundaries of Census Tracts 50.03, 50.04, 51.06, 51.10, 51.13, 51.14, 51.31, and 51.33. As of 2015, all the above census tracts had a minority population that constituted a lower proportion of the total population of San Joaquin County, and all but one (51.14) had a minority population that constituted a lower proportion of the total population of California. When combined, the census tracts had a minority population that constituted a lower proportion of the total population of both San Joaquin County and California.

The U.S. Census Bureau uses the "poverty thresholds" method to measure the number of people in poverty. In Census Tract 51.31, 21.6 percent of the residents have incomes below poverty level. This is higher than those of San Joaquin County (18.6 percent) and of California (16.3 percent).

Three of the eight census tracts in the project area have average household sizes, which are slightly higher than the average household size of San Joaquin County (3.12), and seven of the eight are higher than California (2.9). All eight census tracts in the project area had median household incomes that were higher than the median household income in San Joaquin County ($53,274), and five of the eight census tracts had median household incomes that were higher than the median household income in California ($61,818).

Six of the eight census tracts in the project area have a higher per capita income than the per capita income of San Joaquin County ($22,645), and two of the eight have a higher per capita income than the per capita income of California ($30,318).

Environmental Consequences

Based on available 2010 Census data and 2015 American Community Survey data, it is not likely that the residential area surrounding the project would include areas with a disproportionately larger low-income population than those of San Joaquin County and California, except for Census Tract 15.31. The project would impact only one parcel within that census tract and therefore would be unlikely to disproportionately impact the population. The residential development in that census tract is outside the project footprint, and this population would experience mostly indirect effects during project Phases 1A and 1B such as traffic detours. Such indirect impacts would impact all residents in the area and therefore would not be disproportional. However, noise and air quality effects could potentially disproportionately impact this population during Phases 1A and 1B. Avoidance and minimization measures would be implemented to reduce such indirect impacts, and minority or low-income populations would not be adversely impacted by the project. Overall, the project would be beneficial to nearby residents and commuters, as traffic congestion would be improved, access to State Route 99 and State Route 120 would be improved from local street access points, and flow/wait time of nearby roadway segments and intersections would be improved.

Avoidance, Minimization, and/or Mitigation Measures

Avoidance and minimization measures regarding indirect noise and air quality effects are included under the applicable resource topic sections. Based on the above discussion and analysis, the Build Alternative will not cause disproportionately high and adverse effects on any minority or low-income populations in accordance with the provisions of EO 12898. No further environmental justice analysis is required.

2.1.4 Utilities and Emergency Services

Affected Environment

Utility information for this section was obtained from the project engineer in 2018 and the City of Manteca General Plan Update Existing Conditions Report October 2017. Emergency services information was obtained from City of Manteca General Plan Update Existing Conditions Report October 2017.

Water, wastewater, electric, natural gas utilities, and telecommunications services are located in the project area. The City of Manteca provides potable water service and wastewater disposal service to the project area. Electricity

and natural gas is provided by the Pacific Gas and Electric Company (PG&E). Verizon, Frontier, and Comcast provide telecommunications service in the project vicinity. Portions of the project site that are located in unincorporated San Joaquin County receive water and wastewater service from the South San Joaquin Irrigation District. Kinder Morgan and Sprint provide gas lines and telecommunication lines, respectively, within the Union Pacific Railroad right-of-way.

Emergency service is provided to the project area via the City of Manteca Police Department, California Highway Patrol, and City of Manteca Fire Department. The City of Manteca Sphere of Influence (areas of unincorporated San Joaquin County) is served by Lathrop-Manteca Fire District and Ripon Consolidated Fire Department. Finally, the San Joaquin County Office of Emergency Services is the single coordinating center for major emergency activities in the project area.

Environmental Consequences

Project construction activities may require relocation of utilities that would be affected by the project. Relocations would not present any unusual situations and are considered routine for roadway construction projects.

The Manteca General Plan outlines the City's commitments to maintaining adequate public services and utilities as new development occurs. Also, the City requires undergrounding of utility lines in new development and in areas that are redeveloped, where feasible (Policy PF-I-17). The San Joaquin County General Plan also outlines the County's commitment to providing and maintaining adequate utilities for land within unincorporated San Joaquin County.

Utility facilities would need to be modified or relocated due to implementation of the project. **Table 2-3: Required Utility Relocation and Modifications** shows the utility owners and their facilities that would be impacted by the project and the anticipated utility modifications that would occur.

Table 2-3: Required Utility Relocation and Modifications

Utility Owner	Utility Facility Affected	Relocation or Modification
South San Joaquin Irrigation District	Irrigation line east of and parallel to SR 99, north of the SR 99/SR 120 connector	Relocate easterly into new easement
South San Joaquin Irrigation District	Irrigation line crossing SR 99 ½-mile north of Austin Road	Potential encasement
South San Joaquin Irrigation District	Irrigation line crossing SR 99 ¼-mile south of Austin Road	Potential encasement
City of Manteca	Water line parallel to and crossing SR 99 north of Austin Road	Relocate easterly into new easement
City of Manteca	Sewer line parallel to and crossing SR 99 north of Austin Road	Relocate easterly into new easement
PG&E (Electricity)	Aerial crossing 0.3 mile south of Austin Road	May require an exception to allow the existing pole to remain within the State right-of-way
PG&E (Electricity)	17 kilovolts aerial crossing 50-feet north of Austin Road	Relocate—may require exception to allow relocated pole(s) to be placed within the State right-of-way
PG&E (Electricity)	Underground service on the east side of SR 99, north of Austin Road serving Caltrans lighting and communication cabinets	Relocate Caltrans service connection
PG&E (Electricity)	Parallel to Moffat Boulevard	Raise to provide vertical clearance to new crossing
PG&E (Electricity)	Joint pole parallel to Austin Road (shared with Frontier and Comcast)	Relocate parallel to widen Austin Road
Frontier (Telephone) and Comcast (Cable)	Joint pole parallel to Austin Road (shared with PG&E)	Relocate parallel to widen Austin Road
Kinder Morgan	High pressure gas line in Union Pacific Railroad right-of-way	Further investigation needed; pothole and avoid
Sprint	Underground Fiber Optic Telephone in Union Pacific Railroad right-of-way	Further investigation needed; verify and avoid
Frontier (Telephone)	Underground in Moffat and E Woodward	Further investigation needed; verify and avoid
City of Manteca (Water and Sewer)	In Moffat and E Woodward	Further investigation needed; verify and avoid

Source: Provided by Mark Thomas 2018.
Notes: SR = State Route
PG&E = Pacific Gas & Electric

Temporary lane, road, and intersection closures are expected during construction. Such closures would result in delays but are not expected to disrupt emergency services since the construction contractor would circulate construction schedules and traffic control information to City of Manteca (and as needed to San Joaquin County) emergency service providers. This would allow emergency service providers to plan for the use of alternate routes during project construction-related road closures. The project would improve traffic congestion at the State Route 99/State Route 120 connection within the project boundary once complete. As a result, the improved interchange and roadway system would provide improved access for emergency vehicles in the immediate vicinity and overall study area.

Once operational, implementation of the project would improve the ability of emergency services to serve the community because the project would reduce congestion in the State Route 99/State Route 120 connector area and thus reduce emergency service response times. Structures occupied by emergency services would not be relocated, and no new facilities would need to be developed due to project implementation.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following minimization measures would reduce adverse project effects involving utilities and emergency services:

UT-1 The project will be designed to minimize conflicts with utilities in the project area. The project will include relocation of those utilities that would be inaccessible for maintenance or access purposes as a result of project implementation.

UT-2 The project will be required to notify utility users of any short-term, limited interruptions of service.

UT-3 If unexpected underground utilities are encountered, the project will coordinate with the utility provider to develop plans to address the utility conflict, protect the utility if needed, and limit service interruptions.

UT-4 The project will circulate construction schedules and traffic control information to local emergency service providers at least two weeks before any road closures.

2.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities

Regulatory Setting

Caltrans, as assigned by the Federal Highway Administration, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations 652). It further directs that the special needs of

the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the U.S. Department of Transportation regulations (49 Code of Federal Regulations 27) implementing Section 504 of the Rehabilitation Act (29 U.S. Code 794). The Federal Highway Administration has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the Americans with Disabilities Act requirements to federal-aid projects, including Transportation Enhancement Activities.

Affected Environment

Information for this section was obtained from the Final Traffic Operations Analysis Report (as listed in the List of Technical Studies at the end of this document) prepared for the project in January 2019.

The project sits in an urbanized portion of the City of Manteca and in unincorporated portions of San Joaquin County. The project includes improvements to the State Route 99/State Route 120 connector as well as local roads adjacent to the mainline facility. The following describes the existing conditions of the roadway system within the project area:

- **State Route 120:** This facility is an east-west four-lane freeway within the study area that connects Interstate 5 and State Route 99 through Lathrop and Manteca. State Route 120 provides interchanges at Yosemite Avenue, Airport Way, Union Road, and Main Street. The facility is grade-separated above McKinley Avenue, and a new interchange will be constructed by 2023. In addition, plans are in progress to widen State Route 120 from four to six lanes by 2034. If funding becomes available sooner, widening of State Route 120 would occur by 2030. State Route 120 has a posted speed limit of 65 miles per hour.
- **Main Street Interchange (Post Mile 5.312):** This facility is in a spread-diamond interchange configuration, where Main Street is elevated above State Route 120. The ramp-end intersections are spaced about 1,400 feet apart and operate with traffic signals. Main Street provides one lane in each direction south of State Route 120. North of State Route 120, Main Street provides two travel lanes in each direction.
- **State Route 99:** This facility is a north-south six-lane freeway within the study area. It connects Lodi and Sacramento to the north and Modesto

and Merced to the south. It provides interchanges at Yosemite Avenue, Austin Road and Jack Tone Road in the study area. The route is grade-separated below State Route 120 at the State Route 120/State Route 99 interchange with single-lane direct ramps. State Route 99 has a posted speed limit of 65 miles per hour.

- **Yosemite Avenue Interchange (Post Mile 6.654):** This facility is in a tight-diamond interchange configuration, where Yosemite Avenue is below State Route 120. The ramp-end intersections are spaced about 500 feet apart and operate with coordinated traffic signals. Yosemite Avenue provides four travel lanes (dual left-turn and two through lanes) underneath State Route 120.
- **Austin Road Interchange (About Post Mile 4.822):** This facility is in a modified spread-diamond configuration on the north side of State Route 99. On the south side of State Route 120, a hook off-ramp onto Moffatt Boulevard and a diagonal on-ramp from Austin Road/Moffatt Boulevard are provided. Austin Road is constructed above State Route 120 with a two-lane bridge connecting Moffatt Boulevard to the south and Yosemite Avenue to the north.

Traffic volume data was collected on the freeway mainline within the project area through the Caltrans Performance Measure System, which provided data for every Tuesday, Wednesday and Thursday for 2015. A 3 percent growth rate was applied to the 2015 volumes to determine the existing (year 2017) morning and evening peak hour freeway mainline volumes. Also, weekday morning (7:00 a.m. to 9:00 a.m.) and evening (4:00 p.m. to 6:00 p.m.) peak period turning movement counts were collected at the 11 study intersections between August and October 2016. The following intersections were studied:

1. State Route 120 Eastbound Ramps/Main Street
2. State Route 120 Westbound Ramps/Main Street
3. State Route 99 Northbound Ramps/Yosemite Avenue
4. State Route 99 Southbound Ramps/Yosemite Avenue
5. State Route 99 Northbound Ramps/Austin Road
6. State Route 99 Southbound Ramps/Moffatt Boulevard
7. Austin Road/Moffatt Boulevard
8. Woodward Avenue/Moffatt Boulevard
9. Austin Road/Frontage road
10. Woodward Avenue/Main Street
11. Austin Road/Yosemite Avenue

The existing morning and evening peak hour volumes for the study intersections represent peak month-peak hour volumes.

Level of Service Standards

The following level of service standards are relevant to the analysis of the project for facilities within the City of Manteca and the County of San Joaquin, under the San Joaquin Council of Governments Regional Congestion Management Program, and in the Caltrans right-of-way:

- **City of Manteca:** The City's General Plan identifies the minimum acceptable operations criteria for signalized intersections and all-way stop-controlled intersections as level of service D.
- **County of San Joaquin:** The County's General Plan identifies the minimum acceptable operations criteria for signalized intersections and all-way stop-controlled intersections as level of service D.
- **San Joaquin Council of Governments Regional Congestion Management Program:** The program, adopted in 2018, identifies the operating standard as level of service D. When an intersection or roadway segment is monitored as operating at level of service E or lower, the county or the city in which the deficient segment or intersection is located must prepare a deficiency plan specific to that location.
- **Caltrans:** Based on Caltrans Traffic Operations guidelines, intersections within the Caltrans right-of-way must operate at level of service D or better for all movements.

Table 2-4: Freeway and Intersection Level of Service Criteria shows the level of service standards for freeway mainline and weaving sections and ramp merge/diverge areas and signalized and unsignalized intersections used in this traffic analysis.

Table 2-4: Freeway and Intersection Level of Service Criteria

LOS	Freeway Criteria		Intersection Criteria[3]	
	Density (Passenger Cars/Mile/Lane)[1]		Average Control Delay (seconds/vehicle)	
	Mainline and Weaving Section	Ramp Merge/ Diverge	Signalized Intersections	Unsignalized Intersections
A	≤ 11	≤ 10	≤ 10	≤ 10
B	> 11 to 18	> 10 to 20	> 10 to 20	> 10 to 15
C	> 18 to 26	> 20 to 28	> 20 to 35	> 15 to 25
D	> 26 to 35	> 28 to 35	> 35 to 55	> 25 to 35
E	> 35 to 45	> 35	> 55 to 80	> 25 to 50
F	> 45 or any v_d/c ratio > 1.00[1]	Demand exceeds capacity[2]	> 80	> 50

Source: Fehr and Peers, *Final Traffic Operations Analysis Report (DFTOAR) for the State Route 120/State Route 99 Improvement* Project, pg. 9, Tables 1 and 2, January 2019.
Notes: [1]v_d/c ratio = demand flow rate divided by the capacity of a given segment.
[2] Occurs when freeway demand exceeds upstream (diverge) or downstream (merge) freeway segment capacity, or if off-ramp demand exceeds off-ramp capacity.
[3] The average delay reported for signalized intersections is for all vehicles passing through the intersection, whereas the average delay reported for unsignalized intersections is for the minor street movement with the greatest delay.

Existing Conditions

Level of service under existing year (2017) conditions, as shown in **Figure 2-2: Morning and Evening Peak Hour Freeway Level of Service – Existing Year 2017 Conditions**, would be acceptable at 29 of 30 study segments during the morning peak hour and 25 of 29 study segments during the evening peak hour.

Morning Peak Hour Level of Service

Evening Peak Hour Level of Service

LEGEND

- Freeway Lane Direction
- Acceptable Level of Service (A-D)
- Unacceptable Level of Service (E)
- Unacceptable Level of Service (F)

0 1000 2000
FEET

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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FIGURE 2-2

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Existing Year 2017 Conditions

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The northbound State Route 99 to westbound State Route 120 freeway-to-freeway ramp operates at level of service F during both the morning and evening peak hours. During evening peak hours, severe congestion and slow travel speeds on State Route 120 result in diversion of traffic onto the eastbound State Route 120 off-ramp to Main Street, resulting in level of service E. The eastbound State Route 120 and the southbound State Route 99 merge sections operate at level of service F due to 82 percent of the State Route 120 traffic exiting onto southbound State Route 99. The northbound off-ramp from State Route 99 to westbound State Route 120 operates at level of service F.

It should be noted that with a density of 20.4 passenger cars per mile per lane, the eastbound State Route 120 off-ramp diverge onto southbound State Route 99 would be level of service C. However, because the capacity of the single-lane off-ramp (2,100 vehicles) is exceeded by the 2,365 vehicles exiting eastbound State Route 120 onto southbound State Route 99, the single-lane off-ramp to southbound State Route 99 operates at level of service F conditions. This is shown in **Figure 2-2** by the two dots showing both level of service conditions.

The existing year (2017) morning and evening peak hour level of service conditions were also determined for the 11 studied intersections in the project area. **Table 2-5: Intersection Analysis – Existing** Morning and Evening **Peak Hour Conditions** shows the existing level of service conditions for each of the study intersections during morning and evening peak hours as well as the delay/movement results in seconds per vehicle.

The table indicates three study intersections operate at unacceptable level of service conditions (LOS E) during the evening peak hours under existing conditions.

Table 2-5: Intersection Analysis – Existing Morning and Evening Peak Hour Conditions

Intersection	Control	Morning Peak Hour Delay/ Movement (seconds per vehicle)	Morning Peak Hour LOS	Evening Peak Hour Delay/ Movement (seconds per vehicle)	Evening Peak Hour LOS
1. Westbound SR 120 Ramps/Main Street	Signal	13.0	B	12.6	B
2. Eastbound SR 120 Ramps/Main Street	Signal	24.0	C	23.5	C
3. Southbound SR 99/Yosemite Avenue	Signal	18.3	B	17.2	B
4. Northbound SR 99 Ramps/ Yosemite Avenue	Signal	23.9	C	32.5	C
5. Northbound SR 99 Ramps/Austin Road	All Way Stop Controlled	8.5	A	9.6	A
6. Southbound SR 99 Off-Ramp/ Moffatt Boulevard	All Way Stop Controlled	1.7	A	40.5	**E**
7. Moffatt Boulevard/Austin Road	All Way Stop Controlled	11.8	B	35.1	**E**
8. Moffatt Boulevard/ Woodward Avenue	All Way Stop Controlled	3.2	A	30.3	**E**
9. Frontage Road/Austin Road	Side-Street Stop Control	6.6 (Westbound Left-Turn)	A	8.8 (Westbound Left-Turn)	A
10. Woodward/ Main Street	All Way Stop Controlled	9.0	A	11.7	B
11. Yosemite Avenue/Austin Road	Signal	9.6	A	10.3	B

Source: Fehr and Peers, *Final Traffic Operations Analysis Report for the State Route 120/State Route 99 Improvement Project*, pg. 21, Table 3, January 2019.
Notes: SR = State Route, LOS = level of service, **Bolded Letters** and gray shaded cells denote unacceptable level of service conditions.

Environmental Consequences

Implementation of the project would improve level of service operations along studied freeway segments and intersections. A Final Traffic Operations Analysis Report (as listed in the List of Technical Studies at the end of this

document) was prepared, documenting the improvements that the project would have on the connector facility. The project would not increase traffic or vehicle miles traveled in itself; it would help alleviate future growth impacts identified in the City of Manteca General Plan, San Joaquin County General Plan, and San Joaquin Council of Governments regional growth estimates. The project would not adversely affect existing pedestrian and bicycle facilities.

Phase 1A of the project is anticipated to be constructed between 2021 and 2023. Phases 1B and 1C would be constructed later, depending on funding, and may be completed concurrently. Therefore, the traffic study analyzed Phases 1B and 1C together under the ultimate project analysis, which includes full buildout conditions of Phases 1A, 1B, and 1C of the project. The Final Traffic Operations Analysis Report prepared for this project includes an Interim Year 2033 Phase 1B scenario as a means to determine when Phase 1A conditions would result in degraded levels of service for the studied freeway segments and intersections and when commencement of the ultimate project (Phases 1A, 1B, and 1C) would be required to improve the degraded conditions.

This section presents the modeling results for freeway mainline and intersection conditions under the following scenarios:

- Construction year 2023 morning and evening peak hour conditions – no build
- Construction year 2023 morning and evening peak hour conditions – with project Phase 1A
- Interim Year 2033 morning and evening peak hour conditions - with project Phase 1B
- Design year 2043 morning and evening peak hour conditions – no build
- Design year 2043 morning and evening peak hour conditions – with project Phase 1A
- Design year 2043 morning and evening peak hour conditions – with ultimate project

Freeway segments and intersections that operate at level of service E and F conditions during morning and evening peak hours are considered unacceptable and are considered acceptable if they operate at level of service A, B, C, or D conditions.

Construction Year 2023 Operations

The project is expected to start with construction of Phase 1A in 2021. The level of service conditions were analyzed for the freeway segments and study intersection under Construction Year 2023 No Project and Construction Year

2023 With Phase 1A Project conditions to determine if implementation of the project would degrade level of service conditions.

Figure 2-3: Morning and Evening Peak Hour Freeway Level of Service – Construction Year 2023 No-Project Conditions shows the level of service for freeway segments within the project vicinity under Construction Year 2023 No-Project Conditions for the morning and evening peak hours. As shown in **Figure 2-3,** 24 of the 30 study segments operate at acceptable level of service during the morning peak hour.

The following freeway segments are projected to degrade to level of service F conditions during the morning peak hour: northbound State Route 99 between Jack Tone Road and Austin Road and the northbound State Route 99 off-ramp to Austin Road. In addition, the westbound State Route 120 off-ramp to Main Street is projected to degrade to level of service E conditions. The northbound State Route 99 to westbound State Route 120 freeway-to-freeway ramp would continue to operate at level of service F conditions. Similar to Existing Year 2017 conditions, the off-ramp eastbound State Route 120 onto southbound State Route 99 diverge operates at acceptable level of service B conditions based on density, but the capacity of the single-lane off-ramp would be exceeded, and therefore, operates at level of service F conditions. In addition, with the heavy on-ramp traffic entering southbound State Route 99 from the single-lane eastbound State Route 99 on-ramp, the southbound State Route 99 merge section operates at level of service E conditions.

During the evening peak hour, 20 of the 30 study segments operate at acceptable level of service conditions. As discussed under the Existing Year 2017 and the Construction Year 2023 morning peak hour conditions, the eastbound State Route 120 off-ramp onto southbound State Route 99 would operate at level of service F conditions due to above capacity conditions. All southbound State Route 99 freeway segments located south of the eastbound State Route 120 off-ramp onto southbound State Route 99 would operate at unacceptable level of service conditions. In addition, northbound State Route 99 between Jack Tone Road and Austin Road and northbound State Route 99 off-ramp to Austin Road would operate at level of service E conditions and the northbound State Route 99 off-ramp to westbound State Route 120 would continue to operate at level of service F conditions. Level of service improvements would occur between the State Route 120 Union Road on-ramp and the Main Street off-ramp to acceptable level of service C. The eastbound State Route 120 off-ramp to Main Street would also improve to acceptable level of service D conditions.

Morning Peak Hour Level of Service

Evening Peak Hour Level of Service

LEGEND

- Freeway Lane Direction
- Acceptable Level of Service (A-D)
- Unacceptable Level of Service (E)
- Unacceptable Level of Service (F)

0 1000 2000 FEET

FIGURE 2-3

State Route 99/120 Interchange Connector in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Construction Year 2023 No Project Conditions

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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Figure 2-4: Morning and Evening Peak Hour Freeway Level of Service – Construction Year 2023 With Phase 1A Project shows 27 of the 29 study segments during the morning peak hour and 24 of the 29 study segments during the evening peak hour would operate at acceptable level of service conditions. Implementation of Phase 1A of the project would result in the improvement of all freeway segments to acceptable level of service conditions during the morning peak hour, except for northbound State Route 99 between Jack Tone Road and Austin Road and the northbound State Route 99 off-ramp to Austin Road. All freeway segments would also improve during the evening peak hour, except for northbound State Route 99 between Jack Tone Road and Austin Road, the northbound State Route 99 off-ramp to Austin Road, and southbound State Route 99 from south of the Austin Road on-ramp to south of the Jack Tone Road interchange.

Table 2-6: Intersection Analysis—Construction Year 2023 No-Build, with Project Phase 1A, and with Improved Phase 1A Project Morning and Evening Peak Hour Conditions shows the level of service conditions for the 11 study intersections during Construction Year 2023 without Project, with Phase 1A Project, and Improved Phase 1A Project conditions. **Table 2-6** shows that, under the Construction Year 2023 No-Project scenario, five intersections would operate at unacceptable level of service conditions during the morning peak hours and five intersections would operate at unacceptable level of service conditions during the evening peak hours. Under the Construction Year 2023 with Project Phase 1A Conditions, two intersections would operate at unacceptable level of service conditions during the morning peak hours and five intersections would operate at unacceptable level of service conditions during the evening peak hours. Under the Construction Year 2023 with Improved Phase 1A Conditions, all of the intersections will operate at acceptable levels of service conditions.

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Morning Peak Hour Level of Service

Evening Peak Hour Level of Service

LEGEND

- Freeway Lane Direction
- Acceptable Level of Service (A-D)
- Unacceptable Level of Service (E)
- Unacceptable Level of Service (F)

0 1000 2000 FEET

FIGURE 2-4

State Route 99/120 Interchange Connector in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Construction Year 2023 With Phase 1A Project Conditions

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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Table 2-6: Intersection Analysis – Construction Year 2023 No-Build and with Project Phase 1A Morning and Evening Peak Hour Conditions

Intersection	Construction Year No-Project Conditions		Construction Year with Project Phase 1A Conditions		Construction Year with Improved Phase 1A Project Conditions	
	Morning Peak Hour	Evening Peak Hour	Morning Peak Hour	Evening Peak Hour	Morning Peak Hour	Evening Peak Hour
	LOS	LOS	LOS	LOS	LOS	LOS
1. Westbound SR 120 Ramps/Main Street **(signal)**	C	B	D	D	D	D
2. Eastbound SR 120 Ramps/Main Street **(signal)**	D	D	**F**	**F**	D	D
3. Southbound SR 99 Ramps/Yosemite Avenue **(signal)**	C	B	C	C	C	C
4. Northbound SR 99 Ramps/Yosemite Avenue **(signal)**	**E**	D	D	**E**	D	D
5. Northbound SR 99 Ramps/Austin Road **(All Way Stop Controlled)**	**F**	**F**	B	D	B	C
6. Southbound SR 99 Off-Ramp/Moffat Boulevard **(All Way Stop Controlled)**	**F**	**F**	B	B	A	B
7. Moffat Boulevard/Austin Road **(All Way Stop Controlled)**	**F**	**F**	C	**E**	C	D
8. Moffat Boulevard/Woodward Avenue **(All Way Stop Controlled)**	**F**	**F**	C	**F**	B	C
9. Frontage Road/Austin Road **(Side-Street Stop Controlled)**	C	A	B	C	A	C
10. Woodward/Main Street **(All Way Stop Controlled)**	C	**F**	**F**	**F**	C	C
11. Yosemite Avenue/Austin Road **(Signal)**	B	B	C	D	C	D

Source: Fehr and Peers, *Final Traffic Operations Analysis Report (DFTOAR) for the State Route 120/State Route 99 Improvement* Project, pgs. 35 and 49, Tables 6 and 8 January 2019.

Notes: **Bolded Letters** and gray shaded cells denote unacceptable level of service conditions. SR = State Route

Interim Year 2033 Operations

This section provides the traffic operations analysis results for the project with Phase 1B scenario under interim year 2033 morning and evening peak hour conditions. Analysis under this condition has been prepared for selected freeway segments and intersections within the project study area. The Final Traffic Operations Analysis Report prepared for this project included this scenario as a means to determine when Phase 1A conditions would result in degraded levels of service for the studied freeway segments and intersections and when commencement of Phase 1C would be required to improve the degraded level of service conditions. This Interim Year 2033 Phase 1B scenario also takes into account the continued closure of the Austin Road ramp until commencement of Phase 1C construction (this could constitute an estimated 9 year closure, dependent on funding availability to commence Phase 1C construction).

Figure 2-5: Morning and Evening Peak Hour Freeway Level of Service – Interim Year 2033 Phase 1B Project Conditions indicates 30 of the 37 freeway study segments would operate at acceptable level of service in the morning peak hours. During the evening peak hour, 17 of the 37 freeway study segments would operate at acceptable level of service.

Table 2-7: Intersection Analysis – Interim Year 2033 with Phase 1B Project Morning and Evening Peak Hour Conditions shows the level of service conditions for the 14 intersection during Interim Year 2033 with Phase 1B project conditions. **Table 2-7** shows that, under the Interim Year 2033 with Phase 1B Project, two intersections would operate at unacceptable levels of service during the morning peak hours and all intersections would operate at acceptable levels of service conditions during the evening peak hours.

Morning Peak Hour Level of Service

Evening Peak Hour Level of Service

LEGEND

- Freeway Lane Direction
- Acceptable Level of Service (A-D)
- Unacceptable Level of Service (E)
- Unacceptable Level of Service (F)

0 1000 2000
FEET

FIGURE 2-5

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Interim Year 2033 With Phase1B Project Conditions

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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Table 2-7: Intersection Analysis – Interim Year 2033 with Phase 1B Project Morning and Evening Peak Hour Conditions

Intersection	Control	AM Peak Hour		PM Peak Hour	
		Delay Movement (sec/veh)	LOS	Delay Movement (sec/veh)	LOS
1. WB SR 120 Ramps/Main Street	Signal	15.3	B	14.6	B
2. EB SR 120 Ramps/Main Street	Signal	29.2	C	37.1	D
3. SB SR 99 Ramps/Yosemite Avenue	Signal	41.5	**F**	30.6	C
4. NB SR 99 Ramps/Yosemite Avenue	Signal	62.0	**E**	49.6	D
5. NB SR 99 Ramps/Austin Road	Signal	12.9	B	22.9	C
6. Woodward Avenue/Connector	Signal	23.7	C	44.5	D
7. Austin Road/Moffat Connector	Signal	18.3	B	18.5	B
8. Moffat Boulevard/Woodward Connector	Signal	18.8	B	24.4	C
9. Frontage Road/Austin Road	Side-Street Stop Controlled	11.3 (WB Left-Turn)	B	21.6 (WB Left-Turn)	C
10. Woodward Avenue/Main Street	Signal	39.1	D	33.9	C
11. Yosemite Avenue/Austin Road	Signal	24.3	C	51.9	D
12. NB SR 99 Ramps/Jack Tone Road	Signal	11.3	B	13.3	B
13. SB SR 99 Ramps/Jack Tone Road	Signal	12.6	B	13.6	B
14. NB SR 99 Ramps/Colony Road	Signal	17.4	B	18.1	B

Source: State Route 120/State Route 99 Interchange Project – Final Traffic Operations Analysis Report, January 2019, page 146, Table 25. Notes: **Bolded Letters** and gray shaded cells denote unacceptable level of service conditions. SR = State Route, EB = eastbound, NB = northbound, SB = southbound, WB = westbound, sec/veh = seconds per vehicle

Design Year 2043 Operations

This section provides the traffic operations analysis results for the no-project, with phase 1A and with ultimate project (Phases 1A, 1B, and 1C buildout) scenarios under design year 2043 morning and evening peak hour conditions.

Figure 2-6: Morning and Evening Peak Hour Freeway Level of Service – Design Year 2043 No-Project Conditions indicates 20 of the 30 study segments would operate at acceptable level of service.

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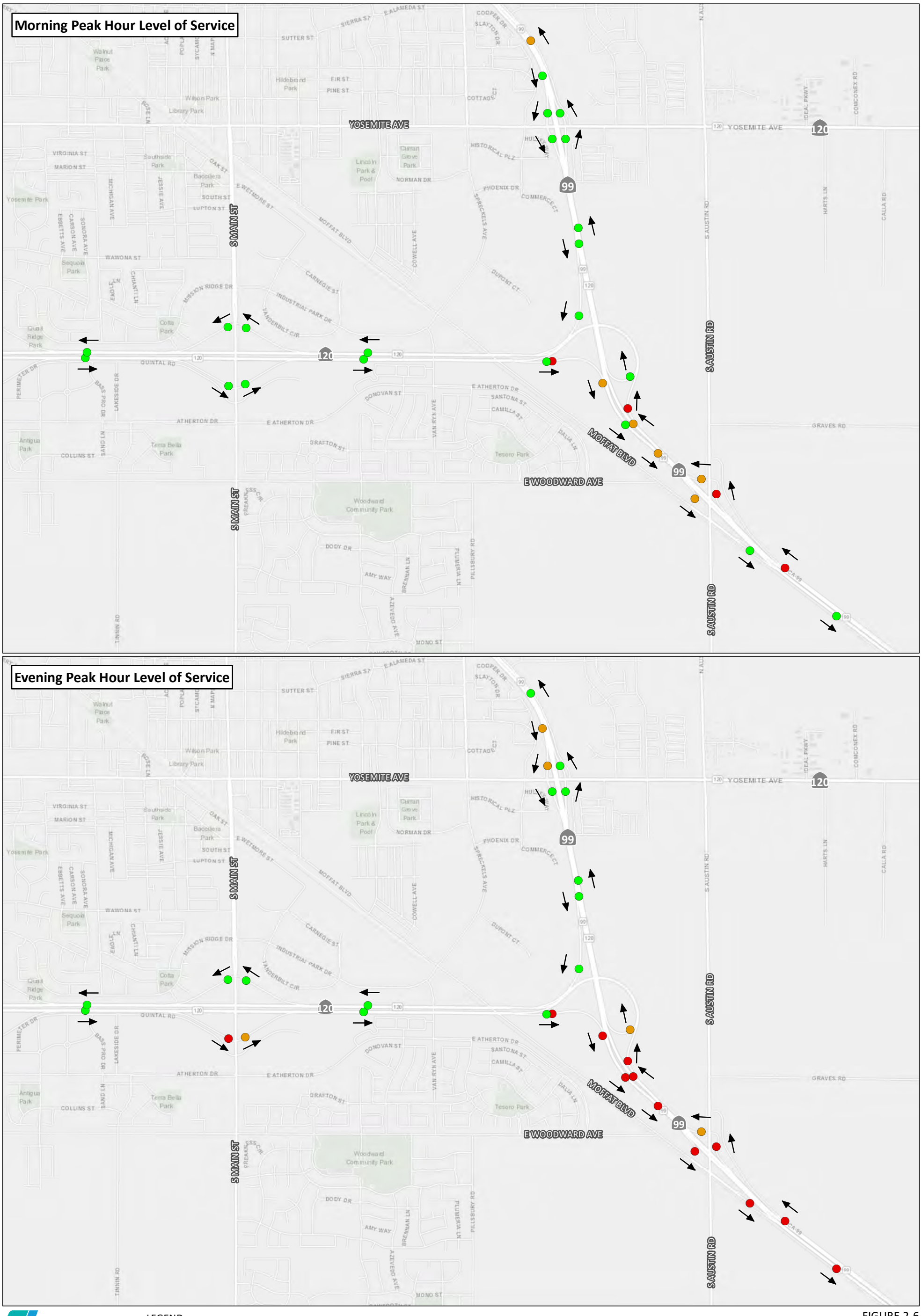


FIGURE 2-6

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Design Year 2043 No Project Conditions

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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Northbound State Route 99 between Jack Tone Road and Austin Road and the northbound State Route 99 off-ramp to Austin Road would operate at level of service F conditions. The northbound State Route 99 on-ramp from Austin Road is projected to degrade to level of service E conditions, and the northbound State Route 99 to westbound State Route 120 freeway-to-freeway ramp would continue to operate at level of service F, as experienced under construction year 2023 no-project conditions and existing year (2017) conditions. As seen under construction year 2023 no-project conditions, the off-ramp from eastbound State Route 120 onto southbound State Route 99 diverge would have acceptable level of service based on density, but the capacity of the single-lane off-ramp would be exceeded and therefore would operate at level of service F conditions.

In addition, with the heavy on-ramp traffic entering southbound State Route 99 from the single-lane eastbound State Route 99 on-ramp, the southbound State Route 99 merge section operates at level of service E conditions. Both the southbound State Route 99 mainline segment before the Austin Road off-ramp and the southbound State Route 99 off-ramp to Austin Road are projected to degrade to level of service E conditions.

During evening conditions, 13 of the 30 study segments would operate at acceptable level of service conditions. The eastbound State Route 120 off-ramp to Main Street would degrade to unacceptable level of service F conditions, and the eastbound State Route 120 on-ramp from Main Street would degrade to unacceptable level of service E conditions. Southbound State Route 99 between the Lathrop Road on-ramp to and including the Yosemite Avenue off-ramp would degrade to level of service E conditions. The eastbound State Route 120 off-ramp onto southbound State Route 99 diverge would operate at level of service F because of capacity. All other southbound freeway segments between the eastbound State Route 120 onto southbound State Route 99 diverge and the Jack Tone Road intersection, including the Austin Road southbound off-ramp and on-ramp, would operate at unacceptable level of service F conditions.

Northbound State Route 99 between Jack Tone Road and the westbound State Route 120 off-ramp, northbound State Route 99 off-ramp to Austin Road, and the northbound State Route 99 off-ramp to westbound State Route 120 are projected to degrade to level of service F conditions. The northbound State Route 99 on-ramp from Austin Road and the northbound State Route 99 on-ramp from eastbound State Route 120 would both operate at level of service E conditions.

Figure 2-7: Morning and Evening Peak Hour Freeway Level of Service – Design Year 2043 With Phase 1A Project Conditions indicates 23 of the 28 study segments are projected to operate at acceptable level of service conditions during the morning peak hour. Northbound State Route 99 between Jack Tone Road and Austin Road would continue to operate at level of service F conditions. The northbound State Route 99 off-ramp to Austin Road is projected to degrade to level of service F conditions. In addition, the northbound State Route 99 to westbound State Route 120 freeway-to-freeway ramp is projected to continue to operate at level of service F conditions. Implementation of Phase 1A of the project would improve the eastbound State Route 120 to southbound State Route 99 freeway-to-freeway ramp conditions from level of service E, under the no-project conditions, to level of service D. Closure of the southbound State Route 99 off-ramp to Austin Road, during Phase 1A, would also improve southbound State Route 99 from level of service E, under the no-project conditions, to level of service C. In addition, the construction of the two-lane eastbound State Route 120 to southbound State Route 99 freeway-to-freeway ramp would improve operations.

During the evening peak hour, 18 of the 28 study segments are project to operate at acceptable level of service conditions. With the closure of the southbound State Route 99 off-ramp to Austin Road, additional traffic would use the eastbound State Route 120 off-ramp to Main Street, resulting in the off-ramp continuing to operate at level of service F conditions. As seen during the morning peak hour design year 2043 with Phase 1A project conditions, construction of the two-lane eastbound State Route 120 to southbound State Route 99 freeway-to-freeway ramp would improve operations to acceptable level of service conditions.

The closure of the southbound State Route 99 off-ramp to Moffat Boulevard/Austin Road would result in southbound State Route 99 between the State Route 120 on-ramp and the Austin Road on-ramp to improve from level of service F (no project) to level of service C (with Phase 1A) conditions.

At the southbound State Route 99 Austin Road on-ramp, the freeway mainline would improve marginally from level of service F to level of service E conditions. Under design year 2043 with Phase 1A of the project, southbound State Route 99 would continue to operate at level of service F conditions between south of the Austin Road on-ramp to south of the Jack Tone Road interchange. Northbound State Route 99 would continue to operate at level of service F conditions from north of the Jack Tone Road interchange to and including the Austin Road off-ramp.

Morning Peak Hour Level of Service

Evening Peak Hour Level of Service

LEGEND

- Freeway Lane Direction
- Acceptable Level of Service (A-D)
- Unacceptable Level of Service (E)
- Unacceptable Level of Service (F)

0 1000 2000
FEET

FIGURE 2-7

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Design Year 2043 With Phase1A Project Conditions

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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Figure 2-8: Morning and Evening Peak Hour Freeway Level of Service – Design Year 2043 With Ultimate Project Conditions shows 27 of the 30 study segments are projected to operate at acceptable level of service conditions during the morning peak hour. The northbound State Route 99 off-ramp to Austin Road is projected to improve marginally from level of service F (no project) to level of service E (with ultimate project) conditions. Northbound State Route 99 between Jack Tone Road and the Austin Road off-ramp would continue to operate at level of service F conditions. Based on the results of the morning peak hour freeway mainline, off-ramp diverge, on-ramp merge and weaving sections analysis, the ultimate project (Phases 1A, 1B, and 1C buildout) meets the purpose and need of the project.

During the evening peak hour, 23 of the 30 study segments are projected to operate at acceptable level of service conditions. Northbound State Route 99 between Jack Tone Road and the Austin Road off-ramp would continue to operate at level of service F conditions. All other northbound State Route 99 study segments would operate at acceptable level of service conditions. No improvement from the design year 2043 no-project conditions would occur to the eastbound State Route 120 off-ramp to Main Street and the eastbound State Route 120 on-ramp from Main Street; both would continue to operate at level of service F and E conditions, respectively.

With construction of the southbound State Route 99 braided ramps and additional lanes on southbound State Route 99 between State Route 120 and the Austin Road overcrossing, southbound State Route 99 and the southbound State Route 99 on-ramp from Austin Road would marginally improve from unacceptable level of service F (no project) to level of service E (with ultimate project). Southbound State Route 99 is projected to continue to operate at level of service F conditions from south of the Austin Road on-ramp to south of the Jack Tone Road interchange. All other freeway study segments would operate at acceptable level of service conditions. Under the design year 2043 conditions, the ultimate project (Phases 1A, 1B, and 1C buildout) would construct enough capacity to serve projected demand volumes for the northbound State Route 99 off-ramp to westbound State Route 120.

Table 2-8: Intersection Analysis—Design Year No-Project, With Project Phase 1A, with Ultimate Project Morning/Evening Peak Hour Conditions shows the level of service conditions for the 12 study intersections during morning and evening peak hours for the design year no-project, design year with project Phase 1A, and design year with ultimate project buildout conditions (Phases 1A, 1B, and 1C buildout). Under the design year no-project scenario, seven intersections would operate at unacceptable level of service conditions during the morning peak hours, and seven intersections would operate at unacceptable level of service conditions during the evening peak hours.

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Morning Peak Hour Level of Service

Evening Peak Hour Level of Service

LEGEND

- Freeway Lane Direction
- Acceptable Level of Service (A-D)
- Unacceptable Level of Service (E)
- Unacceptable Level of Service (F)

0 1000 2000
FEET

FIGURE 2-8

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

AM and PM Peak Hour Freeway Level of Service - Design Year 2043 With Ultimate Project Conditions

SOURCE: ESRI World Light Gray Canvas (01/2019); Traffic Data - Based on Fehr & Peers (01/2019)

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Table 2-8: Intersection Analysis Design Year No-Project, with Project Phase 1A, with Ultimate Project Morning/Evening Peak Hour Conditions

Intersection	Design Year No-Project		Design Year with Project Phase 1A Conditions		Design Year with Ultimate Project Buildout	
	Morning Peak Hours LOS	Evening Peak Hours LOS	Morning Peak Hours LOS	Evening Peak Hours LOS	Morning Peak Hours LOS	Evening Peak Hours LOS
1. Westbound SR 120 Ramps/Main Street	**F**	**F**	**F (D)[1]**	**F (D)[1]**	**F (D)[1]**	**F(D)[1]**
2. Eastbound SR 120 Ramps/Main Street	**F**	**F**	**F (D)[1]**	**F (D)[1]**	**F (D)[1]**	**F(D)[1]**
3. Southbound SR 99 Ramps/Yosemite Avenue	C	C	D	**F**	C	C
4. Northbound SR 99 Ramps/Yosemite Avenue	D	D	**F**	**F**	D	D
5. Northbound SR 99 Ramps/Austin Road	**F**	**F**	**F[2]**	**F[2]**	C	C
6. Southbound SR 99 Off-Ramp/Moffat Boulevard	**F**	**F**	**F[2]**	**F[2]**	A	A
7. Moffat Boulevard/Austin Road	**F**	**F**	**F**	**F**	C	D
8. Moffat Boulevard/ Woodward Avenue	**F**	**F**	D	C	C	B
9. Frontage Road/Austin Road	**F**	**F**	**F**	**F**	B	C
10. Woodward/Main Street	B	C	**F**	**F**	B	C
11. Yosemite Avenue/Austin Road	C	D	**F**	**F**	C	**E**
15. Woodward Avenue/Moffat Boulevard	N/A	N/A	N/A	N/A	B	B

Source: Fehr and Peers, *Final Traffic Operations Analysis Report (DFTOAR) for the State Route 120/State Route 99 Improvement* Project, pgs. 35, 49, and 93 Tables 10 12, and 14 January 2019.

Notes: [1] Implementation of measures TRA-8 and TRA-9 would result in operational improvements at these two intersections during morning and evening peak hours, from level of service F to level of service D. If these measures are not implemented by the City, then these two intersections will continue to operate at unacceptable level of service F conditions.

[2] It should be noted that although these two intersections are showing a level of service F during this scenario, it is more than likely these intersections will be closed. If these intersections are not closed, than both of these intersections would operate at unacceptable level of service F conditions.

Bolded Letters and gray shaded cells denote unacceptable level of service conditions.

LOS = level of service

N/A = Not Applicable because intersection 15 does not exist under these scenarios.

SR = State Route

Under the design year with project Phase 1A scenario, nine intersections would operate at unacceptable level of service conditions during the morning peak hours and 10 intersections would operate at unacceptable level of service conditions during the evening peak hours. Under the design year with ultimate project buildout, two intersections would operate at unacceptable level of service conditions during the morning peak hours and three intersections would operate at unacceptable level of service conditions during the evening peak hours.

The following standard measure will be implemented during general construction activities:

TRA-1 The project will be required to prepare and implement a Traffic Management Plan to address short-term disruptions in existing circulation patterns during construction. The Traffic Management Plan will identify the locations of temporary detours and signage to facilitate local traffic patterns and through-traffic requirements. The Traffic Management Plan will also provide access plans for affected businesses and residential units that will be impacted by short-term and long-term road closures to ensure access to uses are still available during construction activities.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimizations measures were designed to avoid and minimize any potential impacts as a result of project construction or operation activities:

TRA-2 The project's special provisions of the highway contract will require that emergency service providers (i.e., law enforcement, fire protection, and ambulance services) be given adequate advance notice of any road closures during the construction phases of the project.

TRA-3 Construction activities will be coordinated by the project to avoid blocking or limiting access to residential units and businesses to the extent possible as applicable. Residents and business owners will be notified by the project in advance about potential access or parking effects prior to start of construction activities.

Construction Year 2023 with Phase 1A Project

TRA-4 To improve morning and evening peak hour operations at the eastbound State Route 120 off-ramp/Main Street intersection, the ramp will be widened by the City of Manteca to provide the following:

- A 400-foot eastbound State Route 120 off-ramp right-turn lane
- A 300-foot northbound Main Street right-turn

With these improvements, the eastbound State Route 120 off-ramp/Main Street intersection would improve from level of service E to level of service D conditions during the morning peak hour and improve from level of service F to level of service D conditions during the evening peak hour.

TRA-5 To improve morning peak hour operations at the Moffat Boulevard/Woodward Avenue intersection, the intersection will be improved by the project with the installation of a signal. With this improvement, the Moffat Boulevard/Woodward Avenue intersection would improve from level of service F to level of service C conditions during the morning peak hour.

TRA-6 To improve evening peak hour operations at the northbound State Route 99 ramps/Yosemite Avenue intersection, the intersection signal timings will be optimized and coordinated by the City of Manteca to provide additional green time for the eastbound Yosemite Avenue right-turn volume onto northbound State Route 99. With this improvement, the northbound State Route 99 ramps/Yosemite Avenue intersection would improve from level of service E to level of service D conditions during the evening peak hour under the construction year 2023.

TRA-7 To improve evening peak hour operations, the Moffat Boulevard connector/Austin Road, Moffat Boulevard/Woodward Avenue connector, and Woodward Avenue/Main Street will be improved by the City of Manteca with the installation of a signal. With this improvement, the Moffat Boulevard connector/Austin Road intersection would improve from level of service E to level of service C conditions during the evening peak hour; the Moffat Boulevard/Woodward Avenue connector intersection would improve from level of service F to level of service D conditions during the evening peak hour; and, the Woodward Avenue/Main Street intersection would improve from level of service F to level of service D conditions during the evening peak hour.

Design Year 2043 with Phase 1A Project

TRA-8 To improve the morning/evening peak hour operations at the eastbound State Route 120 off-ramp/Main Street intersection, the interchange will need to be reconstructed by the City of Manteca based on San Joaquin Council of Governments Regional Transportation Plan/Sustainable Communities Strategy Interchange Project List. This improvement would need

to be constructed by the City of Manteca prior to design year 2043 conditions. With this improvement, the eastbound State Route 120 off-ramp/Main Street intersection would improve from level of service F to level of service D conditions during the morning/evening peak hours.

Design Year 2043 with Ultimate Project (Phase 1A, Phase 1B, and Phase 1C buildout)

TRA-9 To improve the morning/evening peak hour operations at the State Route 120/Main Street intersections, the interchange would need to be reconstructed by the City of Manteca based on San Joaquin Council of Governments Regional Transportation Plan/Sustainable Communities Strategy Interchange Project List, see Section 1.3 Project Description. This improvement would be constructed by the City of Manteca before design year 2043 conditions. With the improvements, the State Route 120/Main Street intersections would improve from unacceptable level of service F to acceptable level of service D conditions during the morning/evening peak hours.

2.1.6 Visual/Aesthetics

Regulatory Setting

The National Environmental Policy Act (NEPA) of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and aesthetically (emphasis added) and culturally pleasing surroundings (42 U.S. Code 4331[b][2]). To further emphasize this point, the Federal Highway Administration, in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

The California Environmental Quality Act (CEQA) establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of aesthetic, natural, scenic and historic environmental qualities" (California Public Resources Code Section 21001[b]).

Affected Environment

The *Visual Impact Assessment* (as listed in the List of Technical Studies at the end of this document), dated April 2018, contributed to the information and analysis in this section.

The following neighbors were considered for the evaluation of the project:

- Residential units in neighborhoods to the south of State Route 120
- Rural residential units surrounding the project site in unincorporated San Joaquin County

The following highway users were considered for the evaluation of the project:

- Travelers along State Route 120 within and approaching the project
- Travelers along State Route 99 within and approaching the project

The project is located on State Route 99 between postmiles 3.1 to 6.2 and on State Route 120 between postmiles 5.1 to 7.2 in the County of San Joaquin, California near the City of Manteca. With the exception of elevated highway overpasses that provide sweeping, yet brief, panoramic views of the surrounding landscape, the proximate City of Manteca and San Joaquin County land is flat. The aesthetic qualities of the distant Sierra Nevada Mountains, Coast Range, Mount Boardman and Eagle Mountain provide a sense of enclosure among the vastness of the immediate flatlands that surround the project boundary. The landscape is characterized by agricultural production, primarily consisting of orchards and field crops, to the northeast, southeast and southwest. Urban land uses in the City of Manteca characterize the project vicinity to the northwest. State Route 99/120 is the physical dividing line between the City of Manteca's urbanity and the City's southeastern suburban and agricultural frontiers.

The project corridor is defined as the area of land that is visible from, adjacent to, and outside the highway right-of-way, and is determined by topography, vegetation, and viewing distance. General commercial and industrial land uses outline the urbanized portion of the project corridor west of State Route 99, while agriculture land uses surround the eastern edge of the State Route 99 project corridor and the southwest portion of the project corridor. Some residential units that border commercial and industrial land uses have distant views of the project site.

Environmental Consequences

The Build Alternative would result in minor changes to visual resources as measured by changes in visual character and visual quality. The Build Alternative would be slightly larger in scale than the roadway's existing conditions; however, overall visual character and visual quality will remain the same or improve slightly compared to existing conditions.

Most of the Build Alternative would be constructed within existing highway structures, including roadway widening and the addition of auxiliary lanes for on- and off-ramps. It is expected that the changes to the existing structures

will go largely unnoticed by sensitive receptors in the area, including highway users and local residents.

Areas that would result in noticeable visual resource changes would be the State Route 99/Austin Road off-ramp, which would be larger than the existing ramp, and the Moffat Boulevard off-ramp from southbound State Route 99 to meet the extension of East Woodward Avenue. The changes to views as a result of the new elevated off-ramp and roadway would be minimal and located away from most area residences and businesses. There would not be a significant change to the vividness, intactness, and unity of the project area as a result of the State Route 99/Austin Road off-ramp, the extension of East Woodward Avenue, or the Moffat Boulevard elevated off-ramp.

Visual impacts are determined by assessing changes to the visual resources and predicting viewer response to those changes. The biggest view change would be the lengthening and increased elevation of Austin Road over the Union Pacific Railroad tracks. All roads except for Austin Road would remain at essentially the same elevation as in the existing conditions. Austin Road would be about 30 feet taller than the existing at-grade railroad crossing. The proposed Austin Road overpass would not return to the existing grade until 800 feet south of the Union Pacific Railroad tracks. Implementation of the project would result in the acquisition of two homes and relocation of residents along Austin Road south of the Union Pacific Railroad tracks.

On the north side of the freeway, Austin road is raised about 3 feet and returns to original grade at the intersection of the existing frontage road. This change would impact the views of neighbors living in the southwestern quadrant of the project's vicinity, as the increased height of the overcrossing could place the structure within the sightlines of some neighbors. This change would benefit neighbors by removing the existing at-grade crossing of Union Pacific Railroad tracks.

While the proposed lengthening and increased elevation of Austin Road poses a visual change, this slight visual change is a trade-off to designing a safer above-grade crossing for the Union Pacific Railroad tracks at Moffat Boulevard. To construct the new connector road between Austin Road and Woodrow Boulevard, a portion of an existing orchard would be removed. Most of the orchard would not be affected by the project and is anticipated to remain as orchard. Since land uses in the immediate vicinity of Austin Road would remain largely the same, scenic resources in view of the road would not be affected.

The project would require minor tree removal. Because the project site has few trees, this minor tree removal would not change the visual character of the area.

The project would require avoidance and minimization for potential noise impacts that would consist of a noise barrier along the south side of State Route 120 near an existing apartment complex. Existing views from these apartments toward the north, where noise barriers would be constructed, are limited to State Route 120 in the foreground, agriculture and industrial in the middle ground, and urban development in the background. Installation of a noise barrier would obstruct these views for first-story residences in the complex. The noise barriers would be designed consistent with the City of Manteca and Federal Highway Administration design standards and would be only as tall as required to mitigate potential noise impacts. Because the visual quality for these residents is already low, installation of a noise barrier would not further impact the visual quality for the residents of the apartment complex.

In the context of low anticipated viewer response to the project, the minor level of visual changes resulting from the project would represent a low level of overall visual impact.

The *Visual Impact Assessment* concluded that the project would not substantially alter the aesthetics and character of the surrounding community as improvements are occurring on an existing facility. The project would be compatible with existing and planned land uses and would be similar in line, color, and texture as the existing structure. City and County participation in the project will ensure that acceptable architectural features and landscape design are incorporated into the design, consistent with related portions of the 2003 City of Manteca General Plan and San Joaquin County Wide General Plan 2035. Minimization measure AES-1 would ensure landscape improvements and planting are included in the project to reduce aesthetic impacts.

The City of Manteca does not identify or designate scenic routes within its jurisdiction. San Joaquin County designates Interstate 5 from the Sacramento County line south to Stockton as a designated scenic route; however, the City of Manteca is south of Stockton, and Interstate 5 is not visible from the project site. The project would not substantially damage scenic resources, trees, rock outcroppings, or historic buildings within a state scenic highway, as no scenic highways exist within the project area.

Exterior lighting and illuminated signage exist near the project area, and vehicular headlights from vehicles traveling on State Route 99, State Route 120 and nearby roads also serve as near-constant sources of light and glare. The project would not include new lighting elements in an area in which there is currently no lighting. Minimization measure AES-2 would help avoid or minimize any introduced light and glare during Phases 1A, 1B and 1C construction activities.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following minimization measures would reduce adverse effects involving visual/aesthetic resources:

AES-1 The project will provide replacement highway planting, landscape improvements, and maintenance using recycled wastewater within the highway right-of-way at the Austin Road/State Route 99 interchange. These landscape improvements would be for a gateway feature at the Austin Road/State Route 99 interchange in accordance with the 2023 Manteca General Plan's Community Design Element. This would lessen aesthetic impacts of the project by providing a distinct, attractive gateway for the Austin Road/State Route 99 interchange, particularly in its position at the southeastern entrances to the City. Any highway planting will follow the Caltrans Highway Design Manual's Highway Planting Standards and Guidelines (Caltrans 2016).

AES-2 The project will limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.

2.1.7 Cultural Resources

Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including "historic properties," "historic sites," "historical resources," and "tribal cultural resources." Laws and regulations dealing with cultural resources include the following:

The National Historic Preservation Act of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the National Register of Historic Places. Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation the opportunity to comment on those undertakings, following regulations issued by the Advisory Council on Historic Preservation (36 Code of Federal Regulations 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer (SHPO), and Caltrans went into effect for Caltrans projects, both state and local, with Federal Highway

Administration involvement. The PA implements the Advisory Council on Historic Preservation's regulations, 36 Coder of Federal Regulations 800, streamlining the Section 106 process and delegating certain responsibilities to Caltrans. The Federal Highway Administration's responsibilities under the PA have been assigned to the Caltrans as part of the Surface Transportation Project Delivery Program (23 U.S. Code 327).

The California Environmental Quality Act (CEQA) requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California Public Resources Code Section 5024.1 established the California Register of Historical Resources and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the California Register of Historical Resources and, therefore, a historical resource. Historical resources are defined in Public Resources Code Section 5020.1(j). In 2014, Assembly Bill 52 (AB 52) added the term "tribal cultural resources" to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in Public Resources Code Section 21074(a), a tribal cultural resource is a California Register of Historical Resources or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in Public Resources Code Section 21083.2.

Public Resources Code Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the National Register of Historic Places listing criteria. It further requires Caltrans to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the State Historic Preservation Officer before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the National Register of Historic Places or are registered or eligible for registration as California Historical Landmarks. Procedures for compliance with Public Resources Code Section 5024 are outlined in a Memorandum of Understanding (MOU)[1] between Caltrans and California State Historic Preservation Officer, effective January 1, 2015. For most federal-aid projects on the State Highway System, compliance with the Section 106 PA will satisfy the requirements of Public Resources Code Section 5024.

[1] The MOU is on the Caltrans Standard Environmental Reference at http://www.dot.ca.gov/ser/vol2/5024mou_15.pdf

Affected Environment

The following information on cultural resources was obtained from the following reports that were prepared for the project: *State Route State Route 99/State Route 120 Interchange Improvements Project Historic Property Survey Report*; *State Route 99/State Route 120 Interchange Improvements Project Historical Resources Evaluation Report*, and the *State Route 99/State Route 120 Interchange Improvements Archaeological Survey Report* (as listed in the List of Technical Studies at the end of this document).

Two areas of potential effect were delineated for purposes of this project: an Archaeological area of potential effect and a Built Environment area of potential effect. The Archaeological area of potential effect was established as all areas that will be directly affected by the project's proposed ground-disturbing activities, while the Built Environment area of potential effect was established as including all built environment resources constructed over 45 years ago that were not exempt per the Section 106 PA and that have the potential to be directly affected or indirectly affected by the project.

One previously recorded built environment cultural resource in the Built Environment area of potential effect was identified as the Southern Pacific San Joaquin Valley Mainline (P-39-000002/CA-SJO-250H). Segments of this railroad, including a segment within the area of potential effect, have been evaluated as not eligible for listing in the National Register of Historic Places or the California Register of Historical Resources in the past; the State Historic Preservation Office concurred with these findings on January 10, 2019. This resource as a whole, which stretches from Lathrop to Ripon, would not be adversely affected by the project. Removing and widening the at-grade crossings would not result in a substantial change to this resource.

During area of potential effect delineation, 19 parcels containing built environment cultural resources over 45 years old were identified adjacent to or within the project footprint. Coordination with the Project Design Team concluded that 11 of the 19 built environment cultural resources would not be adversely affected by the project because they were set back far enough from the footprint, and/or they were screened by vegetation or other development; therefore, these parcels were excluded from the area of potential effect. Consistent with the Section 106 PA, two of the remaining eight parcels in the area of potential effect did not require evaluation.

The Built Environment area of potential effect contains the project footprint and the six parcels that contain built environment cultural resources over 45 years old that were evaluated for listing in the National Register of Historic Places and the California Register of Historical Resources. Of the six built environment resources evaluated, none appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources under any qualifying criteria.

Regarding archaeological resources, during the field survey of the area of potential effect, field staff found one piece of white improved earthenware, fragments of large mammal cancellous bone, and a refuse scatter of modern glass and ceramic dishes found in Assessor's Parcel Number (APN) 228-060-08. Eleven water conveyance features associated with agricultural use within APN 224-050-15 were found and documented. The field staff identified water standpipes associated with agricultural use within APN 224-050-15 and a single piece of white improved earthenware in isolated context within a recently harvested and disked wheat field in APN 228-060-08.

The area of potential effect contains soils classified as moderate to high in sensitivity for encountering buried precontact archaeological deposits; however, this potential has been affected by decades of ranching and farming activities.

No potential Section 4(f) properties were identified within the project vicinity.

Environmental Consequences

Nineteen parcels containing built environment cultural resources over 45 years old were identified adjacent to or within the project footprint. Based on the design of the proposed project, it was determined that 11 of the 19 built environment cultural resources would not be adversely affected by the project because they were set back far enough from the footprint, and/or they were screened by vegetation or other development. Two of the remaining eight parcels in the area of potential effect did not require evaluation because they met the Section 106 exemption criteria as Property Type 3: Buildings so altered as to appear less than 30 years old, or Property Type 1: Minor, ubiquitous, or fragmentary infrastructure elements (mobile homes).

The remaining six parcels contained built environment cultural resources over 45 years old that were evaluated for listing in the National Register of Historic Places and California Register of Historical Resources to determine if implementation of the project would affect these resources. The analysis results concluded that of the six built environment resources evaluated, none appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources under any qualifying criteria. SHPO has concurred with these findings and documentation of SHPO concurrence is provided in Appendix E. Therefore, implementation of the project would not impact built environment cultural resources during construction Phases 1A, 1B, and 1C and project operation.

The following standard measures would avoid impacts to cultural resources within the area of potential effect:

CULT-1 Prior to any ground disturbance, a qualified archaeologist will conduct a preconstruction meeting to orient the construction crew to the potential for encountering prehistoric archaeological

deposits during construction. This instructional meeting will also include a discussion of the types of artifacts that could be encountered and the steps to take upon discovery to avoid inadvertent impacts to such finds.

CULT-2 If cultural materials are discovered during construction, all earth-moving activity within 60 feet of the find will be diverted until a qualified archaeologist can assess the nature and significance of the find. If the cultural materials are Native American in origin, Native American groups would be contacted.

CULT-3 If human remains are encountered during project construction activities, the project will comply with the requirements of California Health and Safety Code Section 7050.50. There will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of San Joaquin County has determined the manner and cause of any death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his/her authorized representative. At the same time, an archaeologist will be contacted to assess the situation and consult with agencies as appropriate. Project personnel/construction workers will not collect or move any human remains and associated materials. If the human remains are of Native American origin, the Coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendent to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. At this time, the person who discovered the remains will contact Ben Elliot, Acting Senior Environmental Planner, Northern San Joaquin Valley Cultural Resources Branch, (209) 942-6191, so he may work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code 5097.98 are to be followed as applicable.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance, minimization, and/or mitigation measure is required for project effects involving cultural resources.

CULT-1 Prior to any ground disturbance, a qualified archaeologist will conduct a preconstruction meeting to orient the construction crew to the potential for encountering prehistoric archaeological deposits during construction. This instructional meeting will also include a discussion of the types of artifacts that could be

encountered and the steps to take upon discovery to avoid inadvertent impacts to such finds.

2.2 Physical Environment

2.2.1 Hazardous Waste and Materials

Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, and the Resource Conservation and Recovery Act (RCRA) of 1976. The purpose of the Comprehensive Environmental Response, Compensation and Liability Act, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The Resource Conservation and Recovery Act provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include the following:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act
- Atomic Energy Act
- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts above, Executive Order 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the California Health and Safety Code and is also authorized by the federal government to implement the Resource Conservation and Recovery Act in the state. California law also addresses specific handling,

storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Affected Environment

An *Initial Environmental Site Assessment,* dated December 10, 2018, and an *Aerially Deposited Lead Assessment*, dated February 2018 (both listed in the List of Technical Studies at the end of this document) were prepared for the project and contribute to the following analysis.

Historical uses of the project site and existing structures indicate the potential presence of site contamination by aerially deposited lead (ADL), asbestos-containing material, and lead-based paint. Most of the project site was occupied by agricultural uses in the past, so on-site soils are likely impacted with hazardous levels of pesticides, herbicides, and arsenic. The project site has also been historically occupied (since the early 20th century) by railroad tracks. Soils surrounding railroad tracks are often impacted with elevated levels of metals, petroleum hydrocarbons, and polyaromatic hydrocarbons.

The Phase I report prepared for the project identified four recognized environmental conditions (REC) that could potentially result in the release of hazardous materials during project construction.

The REC-1 identified as part of the Phase 1 report indicated that State Route 99, Moffat Boulevard, and Austin Road have supported vehicular activity since the early 20th century, so it is likely that the surface soils around these roads could potentially be contaminated with aerially deposited lead. An aerially deposited lead site investigation occurred in January 2017 and concluded that soil in this area is Soil Type “X-Non-hazardous Waste.” This type of soil will not be subject to management under the conditions of the Caltrans Variance; however, construction contractor notification will be required and preparation of a Lead Compliance Plan for worker safety will be required.

The REC-2 identified that the Austin Road overpass structure and surrounding areas may have surface markings and signs that contain asbestos-containing materials and lead-based paint. These materials will

need to be surveyed for asbestos-containing materials and lead-based paint as necessary prior to demolition or renovation to ensure the safety of construction workers.

The REC-3 identified that properties along the project right-of-way have been in agricultural use since the 1930s, so it is likely the soil in these areas have been impacted with hazardous levels of pesticides, herbicides, and arsenic.

REC-4 identified the presence of railroad tracks in the project area since the early 20th century. Soils surrounding rail tracks often have elevated levels of metals, petroleum hydrocarbons and polyaromatic hydrocarbons; all of which could be hazardous to construction workers who are exposed to these chemicals.

A follow-up investigation for REC-3 and REC-4 occurred in July 2018 to determine potential effects to soils from agricultural and railroad use in the project area. The investigation concluded that most of the soils within the project site can be used in an unrestricted manner except in two places. Soils at the intersection of the Woodward Avenue/Railroad right-of-way and the Austin Road/Railroad right-of-way exceed the residential limit for unrestricted land use; however, the soils in this area meet the commercial/industrial thresholds associated with lead and petroleum hydrocarbons.

Environmental Consequences

The project area may have soil affected by deposition of aerially deposited lead, pesticides, herbicides and arsenic (from past agricultural uses); they may have surface markings and signs that contain asbestos-containing materials and lead-based paint. The Initial Site Assessment indicated that if surface soils are disturbed, testing should be done to determine the levels of these hazardous materials and a work plan would be prepared in the event testing determines levels exceed standards. The project site has been occupied by railroad tracks; soils near such facilities have the potential to have elevated levels of metals petroleum hydrocarbons and polyaromatic hydrocarbons. If work encroaches on railroad right-of-way, a work plan will be developed to characterize the soils in the disturbance areas and the soils will be managed based on findings in accordance with state and federal regulations. Other than the findings noted above, environmental areas of concern regarding hazardous waste and materials were not identified.

As excavation during construction could reveal unknown hazardous materials or contamination (asbestos-containing materials, lead-based paint, pesticides, herbicides, and arsenic) of soils, implementation of avoidance and minimization measures **HAZ-1** through **HAZ-4** would be necessary.

Federal and state agency regulatory lists were reviewed to identify the presence of hazardous waste sites near the project. Most of the hazardous waste sites identified were either closed, down- or cross-gradient, or too far

up-gradient to pose an impact to the project site or construction workers on the project site.

Avoidance, Minimization, and/or Mitigation Measures

The following avoidance and minimization measures are required for project effects involving hazardous waste and materials.

HAZ-1 Structures/Buildings constructed prior to 1989 may have been constructed using asbestos-containing materials. The project will conduct asbestos surveys using a certified consultant prior to any modification to or demolition to accommodate the planned construction.

HAZ-2 Structures/Buildings constructed prior to 1978 are presumed to contain lead-based paints. The project will conduct lead-based paint surveys using a certified consultant prior to modifications/ demolition of structures that may be altered or demolished to accommodate the planned construction.

HAZ-3 Wood guardrail posts may have been treated with a chemical preservative to protect the wood from decay. Per Department of Toxic Substances Control Board regulations, Treated Wood Waste may be handled as a solid waste and testing and sampling of Treated Wood Waste is not required. The project will follow this guidance along with Caltrans specifications in the disposal of Treated Wood Waste.

HAZ-4 To avoid impacts from pavement striping during construction, it is recommended that testing and removal requirements for yellow striping and pavement marking materials be performed by the project in accordance with Caltrans Standard Special Provision 14-11.12 - Remove Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue.

2.2.2 Air Quality

Regulatory Setting

The Federal Clean Air Act, as amended, is the main federal law that governs air quality; the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. Environmental Protection Agency (U.S. EPA) and the California Air Resources Board, set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10

micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$)—and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (PB), and state standards exist for visibility-reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA. In addition to this environmental analysis, a parallel "conformity" requirement under the Federal Clean Air Act also applies.

Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan for attaining the NAAQS. "Transportation conformity" applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and "maintenance" (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 Code of Federal Regulations 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10} and $PM_{2.5}$), and in some areas (though not in California), sulfur dioxide (SO_2). California has nonattainment or maintenance areas for all of these transportation-related "criteria pollutants" except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the Federal Clean Air Act to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans and FTIPs that include all transportation projects planned for a region over a period of at least 20 years (for the Regional Transportation Plan) and 4 years (for the Federal Transportation Improvement Program). Regional Transportation Plan and Federal Transportation Improvement Program conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the Federal

Clean Air Act and the State Implementation Plan are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), Federal Highway Administration, and Federal Transit Administration (FTA) make the determinations that the Regional Transportation Plan and Federal Transportation Improvement Program are in conformity with the State Implementation Plan for achieving the goals of the Federal Clean Air Act. Otherwise, the projects in the Regional Transportation Plan and/or Federal Transportation Improvement Program must be modified until conformity is attained. If the design concept and scope and the "open-to-traffic" schedule of a proposed transportation project are the same as described in the Regional Transportation Plan and Federal Transportation Improvement Program, then the project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming Regional Transportation Plan and FTIP; the project has a design concept and scope that has not changed significantly from those in the Regional Transportation Plan and FTIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in particulate matter areas, the project complies with any control measures in the State Implementation Plan. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in carbon monoxide and particulate matter nonattainment or maintenance areas to examine localized air quality impacts.

California Environmental Quality Act

CEQA is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA documents address California Clean Air Act requirements for transportation projects. While state standards are often more strict than federal standards, the state has no conformity process.

Local

The EPA has delegated responsibility to air districts to establish local rules to protect air quality. Caltrans' Standard Specification 14-9.02 (Caltrans, 2018) requires compliance with all applicable air quality laws and regulations including local and air district ordinances and rules.

The San Joaquin Valley Air Pollution Control District jurisdiction covers an eight-county area of California's Central Valley consisting of San Joaquin County, Stanislaus County, Merced County, Madera County, Fresno County, Kings County, Tulare County, and the San Joaquin Valley Air Basin portion of Kern County. The San Joaquin Valley Air Pollution Control District prepares regional strategies to attain and maintain air quality conditions though a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The

district has prepared the following plans to address regional nonattainment of criteria pollutant standards. **Table 2-9: San Joaquin Valley Air Pollution Control District Air Quality Plans** show the plans of the district.

Table 2-9: San Joaquin Valley Air Pollution Control District Air Quality Plans

Plan Title	Applicable Standard
2005 CO Redesignation Request and Maintenance Plan	8-Hour CO NAAQS (1971)
2007 PM_{10} Maintenance Plan	24-Hour PM_{10} NAAQS (2006)
2012 $PM_{2.5}$ Plan	24-Hour $PM_{2.5}$ NAAQS (2006)
2013 Plan for the Revoked 1-Hour Ozone Standard	1-Hour O_3 NAAQS (Revoked 2005)
2015 Plan for the 1997 $PM_{2.5}$ Standard	24-Hour and Annual $PM_{2.5}$ NAAQS (1997)
2016 Ozone Plan for the 2008 8-Hour Ozone Standard	8-Hour O_3 NAAQS (2008)
2016 Moderate Area Plan for the 2012 $PM_{2.5}$ Standard	24-Hour and Annual $PM_{2.5}$ NAAQS (2012)

Source: *Air Quality Report State Route 99/State Route 120 Interchange Connector Project*, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018.

In addition to the regional air quality plans supporting the State Implementation Plan, the San Joaquin Valley Air Pollution Control District has published a book of Rules and Regulations that control activities involving various sources of air pollution. The district's rule book is topically divided into nine regulations; the most relevant for the proposed project is Regulation VIII – Fugitive PM_{10} Prohibition. Regulation VIII outlines fugitive dust emission control techniques and strategies to reduce ambient concentrations of PM_{10} by requiring actions to prevent, reduce, or mitigate fugitive dust emission sources such as construction, demolition, excavation, other earthmoving activities, bulk materials, carryout and trackout, open areas, paved and unpaved roads, unpaved vehicle/equipment traffic areas, and agricultural sources. Construction of the project will be subject to compliance with all applicable provisions of Regulation VIII.

Construction of the project will also be subject to Rule 9510 Indirect Source Review (ISR), under Regulation IX – Mobile and Indirect Sources. The Indirect Source Review rule applies to residential, commercial, and industrial land use projects, as well as transportation and transit projects whose construction exhaust emissions will result in a total of two tons per year of Nitrogen oxides (NO_X) or PM_{10}. The Indirect Source Review rule seeks to reduce the growth in NO_X and PM_{10} emissions associated with construction and operation of new development, transportation and transit projects in the San Joaquin Valley.

Rule 9510 requires implementation of control measures to mitigate construction-related NO_X and PM_{10} emissions from roadway projects in excess of 2.0 tons of annual exhaust emissions. Transportation or transit projects exceeding 2.0 tons of construction-related exhaust NO_X or PM_{10} emissions are required to reduce NO_X emissions by 20 percent and PM_{10} exhaust emissions by 45 percent compared to the statewide fleet average.

Affected Environment

The Air Quality Report (as listed in the List of Technical Studies at the end of this document), dated August 2018, contributed to the information and analysis in this section.

The project lies in and near the City of Manteca in San Joaquin County, an area within the San Joaquin Valley Air Basin, which includes San Joaquin County, Stanislaus County, Merced County, Madera County, Fresno County, Kings County, Tulare County, and the San Joaquin Valley Air Basin portion of Kern County. Air quality regulation in the San Joaquin Valley Air Basin is administered by the San Joaquin Valley Air Pollution Control District.

The current population of San Joaquin County is 746,868. The population is projected to reach 1,050,000 in 2042. The county's economy is largely driven by manufacturing, healthcare, transportation, warehousing, agriculture, the Port of Stockton, and educational and government services.

The topography and meteorology of the San Joaquin Valley provide ideal conditions for trapping air pollution for long periods of time and producing harmful levels of air pollutants, including O_3 and particulate matter. Low precipitation levels, cloudless days, high temperatures, and light winds during the summer in the San Joaquin Valley are conducive to high O_3 levels resulting from the photochemical reaction of NO_X and volatile organic compounds (VOC). Inversion layers in the atmosphere during the winter can trap emissions of directly emitted $PM_{2.5}$ and $PM_{2.5}$ precursors (such as NO_X and SO_2) within the San Joaquin Valley for several days, accumulating to unhealthy levels.

Table 2-10: State and Federal Attainment Status lists the state and federal attainment status for all regulated pollutants. Under the federal standards, the project area is designated nonattainment-extreme for the 8-hour O_3 standard and nonattainment-moderate for the $PM_{2.5}$ standard. The project area is designated attainment for the PM_{10} standard and attainment/unclassified for CO, NO_2, and SO_2. Under the state standards, the project area is designated nonattainment for the 1-hour O_3 standard, the 8-hour O_3 standard, the PM_{10} standards and the $PM_{2.5}$ standards. Under the state standards, the project area is designated attainment for the standards for CO, NO_2, SO_2, Pb, sulfates, and vinyl chloride, and the project area is designated unclassified for the Visibility-Reducing Particles (VRP) and Hydrogen Sulfide (H_2S) standards.

Table 2-10: State and Federal Attainment Status

Pollutant	State Attainment Status	Federal Attainment Status
Ozone (O_3)	1 Hour: Nonattainment-Severe 8-Hour: Nonattainment	1-Hour: Revoked in 2005 8-Hour: Nonattainment-Extreme
Respirable Particulate Matter (PM_{10})	Nonattainment	Attainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment	Nonattainment-Moderate
Carbon Monoxide (CO)	Attainment/Unclassified	Attainment/Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment/Unclassified
Sulfur Dioxide (SO_2)	Attainment	Attainment/Unclassified
Lead (Pb)	Attainment	No Designation/Classification
Visibility-Reducing Particles	Unclassified	N/A
Sulfates	Attainment	N/A
Hydrogen Sulfide	Unclassified	N/A
Vinyl Chloride	Attainment	N/A

Source: Air Quality Report State Route 99/State Route 120 Interchange Connector Project, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018.
N/A = Not Applicable

Air quality conditions in the project area are most accurately characterized by ambient pollutant concentrations measured at monitoring stations in Manteca (PM_{10} and $PM_{2.5}$) and Stockton (O_3, CO, NO_2). The Manteca air quality monitor sits about 3 miles northwest of the project area and is the closest monitoring station, but it is equipped to monitor concentrations only of PM_{10} and $PM_{2.5}$. Concentrations of O_3, CO, and NO_2 are supplemented using data from the Stockton monitor, which is about 12 miles north of the project area.

Table 2-11: Air Quality Concentrations for the Past Five Years Measured at Manteca lists air quality trends in data collected at Manteca for the past five years and **Table 2-12: Air Quality Concentrations for the Past Five Years Measured at Stockton** lists air quality trends in data collected at Stockton for the past five years. Data from 2017 was not available at the time of report preparation. The air quality monitoring data presented in these tables is consistent with the nonattainment designations for O_3 and particulate matter.

Table 2-11: Air Quality Concentrations for the Past Five Years Measured at Manteca

Pollutant	Standard	2012	2013	2014	2015	2016
PM_{10}						
Max 24-hr concentration (µg/m^3)		138.6	140.1	109.0	107.3	71.7
No. days exceeded: State Federal	50 µg/m^3 150 µg/m^3	N/A 0	N/A 0	N/A 0	N/A 0	N/A 0
Annual Average concentration µg/m^3		25.8	32.9	29.6	28.9	24.8
Exceed State Standard?	20 µg/m^3	Yes	Yes	Yes	Yes	Yes
$PM_{2.5}$						
Max 24-hr concentration (µg/m^3)		48.3	53.5	51.7	62.1	50.8
No. days exceeded: Federal	35 µg/m^3	4	15	10	16	5
Annual average concentration (µg/m^3)		8.2	11.6	9.8	12.6	9.8
Standard Exceeded? State Federal	12 µg/m^3 12.0 µg/m^3	No No	No No	No No	Yes Yes	No No

Source: Air Quality Report State Route 99/State Route 120 Interchange Connector Project, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018.
Notes: µg/m^3 = micrograms
N/A = Not Applicable

Table 2-12: Air Quality Concentrations for the Past Five Years Measured at Stockton

Pollutant	Standard	2012	2013	2014	2015	2016
Ozone						
Max 1-hr concentration (ppm)		0.097	0.080	0.090	0.094	0.102
No. days exceeded: State	0.09 ppm	1	0	0	1	2
Max 8-hr concentration (ppm)		0.083	0.067	0.077	0.078	0.078
No. days Exceeded: State Federal	0.070 ppm 0.070 ppm	5 5	0 0	4 4	2 2	2 2
Carbon Monoxide						
Max 1-hr concentration (ppm)_		3.0	2.7	2.9	2.4	1.8
No. days exceeded: State Federal	20 ppm 35 ppm	0 0	0 0	0 0	0 0	0 0
Max 8-hr concentration (ppm)		1.8	1.8	2.1	1.5	1.3
No. days exceeded: State Federal	 9.0 ppm 9.0 ppm	 0 0	 0 0	 0 0	 0 0	 0 0
Nitrogen Dioxide						
Max 1-hr concentration (ppm)		0.078	0.062	0.067	0.058	0.064
No. days exceeded: State Federal	 0.18 ppm 0.10 ppm	 0 0	 0 0	 0 0	 0 0	 0 0
Annual average concentration (ppm)		0.014	0.015	0.013	0.011	0.012
Standard Exceeded? State Federal	 0.030 ppm 0.053 ppm	 No No	 No No	 No No	 No No	 No No

Source: Air Quality Report State Route 99/State Route 120 Interchange Connector Project, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018.
Notes: ppm = parts per million

Sensitive receptors that could be exposed to air quality emissions during project construction and operation are located nearby. The land uses where these sensitive receptors are located have been grouped into subareas (Areas A through I) and their distances from the project site range from as close as 40 feet to as far as 670 feet.

Environmental Consequences

SJCOG adopted the Final 2019 Federal Transportation Improvement Program (FTIP) Amendment 4 (2019 FTIP Amendment 4) and 2018 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS) Amendment 1 (2018 RTP/SCS Amendment 1) and 2015 Ozone Conformity Analysis for the 2018 RTP/2019 FTIP as amended on June 28, 2018. The proposed project is listed in the SJCOG's 2018 financially constrained RTP/SCS Amendment 1 which was found to conform by SJCOG on September 20, 2018 and FHWA and FTA made a regional conformity determination finding on December 17, 2018. The project is included in the financially constrained 2019 FTIP Amendment 4, under RTP MPO IDs SJ14-1004, SJ18-1002, and SJ18-1003. The 2019 FTIP Amendment 4 is anticipated to be determined to conform by FHWA and FTA by May 29, 2019. The design concept and scope of the proposed project is consistent with the project description in the 2018 RTP/SCS Amendment 1, 2019 FTIP Amendment 4, and the "open to traffic" assumptions of the SJCOG's regional emissions analysis.

Air pollution emissions associated with the project would occur over the short term from construction activities. **Table 2-13: Construction Emissions Estimates** shows the daily and total construction emissions estimates during different construction activities while the project is being developed.

Table 2-13: Construction Emissions Estimates

Phase	PM_{10}	$PM_{2.5}$	CO	NO_x
Daily Emissions (pounds per day, tons per day CO_2)				
Land Clearing/Grubbing	101.5	21.8	17.7	27.7
Excavation/Grading	103.7	23.4	39.5	65.3
Subgrade/Drainage/Utilities	101.5	22.1	31.6	27.0
Structures	1.5	1.4	40.4	32.1
Paving	1.6	1.2	23.8	27.1
Maximum Daily (pounds, tons CO_2)	**103.7**	**23.4**	**40.4**	**65.3**
Total Exhaust Emissions (tons, metric tons CO_2)				
Land Clearing/Grubbing	< 0.1	<0.1	0.2	0.3
Excavation/Grading	0.2	0.1	2.2	3.6
Subgrade/Drainage/Utilities	< 0.1	<0.1	0.7	0.6
Structures	0.4	0.4	10.1	8.5
Paving	0.1	0.1	2.1	2.4
Project Total (tons, metric tons CO_2)	**0.8**	**0.7**	**15.30**	**15.40**

Source: Air Quality Report State Route 99/State Route 120 Interchange Connector Project, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018.
Notes: CO_2 = carbon dioxide

Table 2-13 indicates that implementation of the project would exceed the requirements of San Joaquin Valley Air Pollution Control District's Rule 9510, Indirect Source Review, as construction emissions of NO_x resulting from excavation/grading and paving are in excess of 2.0 tons per year. Under the San Joaquin Valley Air Pollution Control District's Rule 9510, transportation or transit projects where construction exhaust emissions equal or exceed 2.0 tons of NO_x or PM_{10} emissions are required to reduce NO_x emissions by 20 percent and PM_{10} emissions by 45 percent, compared to the statewide fleet average. Minimization measures described below will be included as part of the project design to reduce or minimize air pollutant emissions associated with construction during Phases 1A, 1B and 1C.

Operational emissions were calculated for the project using CT-EMFAC2014, which contains a comprehensive emissions inventory of motor vehicles that provides estimated emissions rates for air pollutants. **Table 2-14: Summary of Comparative Emissions Analysis** shows emissions under existing conditions and 2023 and 2043 for the no-build project and proposed project. Emissions decrease in 2023 and 2043 with the project compared to the existing conditions mostly due to fleet turnover and improvements in exhaust controls. When the project is compared with the no-build project, the project would result in slight reductions in daily criteria pollutant emissions because of improved traffic flow, except for CO and particulate matter in 2043. The minor increase in daily CO emissions is associated with the overall increase in vehicle miles traveled (VMT) throughout the project area resulting from

reconfiguration of the State Route 99/State Route 120 connector. The marginal increase in daily particulate matter emissions in 2043 is attributed to increases in brake and tire wear associated with the expanded capacity and annual average daily traffic count.

Table 2-14: Summary of Comparative Emissions Analysis

Scenario/ Analysis Year	CO (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)	NO_x (surrogate for NO_2) (lbs/day)
Existing Conditions – 2017	1,149.1	63.7	30.0	706.6
No-Build Alternative – 2023	808.9	74.8	31.3	308.7
Project – 2023	759.6	70.5	29.5	289.1
No-Build Alternative – 2043	434.9	81.6	33.0	100.5
Project	440.8	82.8	33.5	98.4

Source: Air Quality Report State Route 99/State Route 120 Interchange Connector Project, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018, pg. 38.
Notes: lbs/day = pounds per day

The results provided in **Table 2-14** indicate that the project would not affect long-term emissions because emissions generated by the project would not exceed emissions standards.

The project was analyzed for CO hot-spots according to the Caltrans CO protocol, which complies with Section 176(c) of the 1990 Federal Clean Air Act Amendments, federal conformity rules, state and local adoptions of the federal conformity rules, and CEQA requirements (California Code of Regulations Title 21 Section 1509.3(25)). According to the CO protocol results, the project is satisfactory, and no further quantitative analysis is needed. The project would not be expected to create a CO hot-spot, so the project has demonstrated project-level conformity for CO.

The project was analyzed for particulate matter hot-spots based on the *Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas* released by the EPA in November 2015. The project has undergone interagency consultation regarding a project of air quality concern (POAQC) determination and the interagency consultation participants concurred that the project is not a project of air quality concern on October 12, 2018. The project is not a project of air quality concern because it does not meet the definition stated in the EPA's Transportation Conformity Guidance; therefore, particulate matter hot-spot analysis is not warranted.

In October 2016, the Federal Highway Administration released updated guidance for determining when and how to address mobile source air toxics (MSAT) analysis under NEPA. As the 2043 with project conditions would have an annual average daily traffic count above 140,000, the project has the potential for meaningful differences in mobile source air toxics emissions when compared to the No-Build Alternative. Therefore, the level of emissions for the highest priority mobile source air toxics was evaluated. **Table 2-15: Summary of Comparative MSAT Emissions Analysis** provides the results of the modeling for mobile source air toxics emissions during existing conditions, no-build and project in 2023 conditions, and no-build and project in 2043 conditions.

Table 2-15: Summary of Comparative MSAT Emissions Analysis

Scenario/Analysis Year	1,3-butadiene (pounds per day)	Acetaldehyde (pounds per day)	Acrolein (pounds per day)	Benzene (pounds per day)	Diesel PM (pounds per day)	Formaldehyde (pounds per day)	Naphthalene (pounds per day)	Polycyclic Organic Matter (pounds per day)
Existing Conditions (2017)	0.33	1.42	0.07	1.61	7.36	3.33	0.05	0.08
No-Build (2023)	0.22	0.79	0.05	1.06	1.54	1.92	0.03	0.05
Project (2023)	0.21	0.74	0.04	0.99	1.45	1.79	0.03	0.04
No-Build (2043)	0.14	0.57	0.03	0.68	0.87	1.35	0.02	0.03
Project (2043)	0.14	0.56	0.03	0.68	0.87	1.32	0.02	0.03

Source: Air Quality Report State Route 99/State Route 120 Interchange Connector Project, prepared by Terry A. Hayes Associates Inc., Caltrans, August 2018, pg. 42.

The project would marginally reduce daily emissions for all mobile source air toxic compounds relative to existing conditions and the No-Build Alternative (in 2023 and 2043); therefore, the project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in mobile source air toxics impacts based on vehicle miles traveled, vehicle mix, and speed. Construction activities will last for more than 5 years. Construction-related emissions have been included in any hot spot analysis performed for conformity purposes, and have been included in the regional conformity analysis (40 CFR 93.123(c)(5)).

The project is included in the San Joaquin Council of Governments Year 2018 Regional Transportation Plan, and the associated Air Quality Conformity Analysis verifies that the Regional Transportation Plan and the 2019 Transportation Improvement Plan conform with the latest EPA transportation conformity regulations and the conformity State Implementation Plan. There is no potential for the project to interfere with air quality plans that are designed to reduce cumulative air quality impacts in the project area.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the following minimization measures would reduce adverse effects involving air quality:

AQ-1 The following measures will be implemented by the project during construction activities:

- The construction contractor must comply with Caltrans' Standard Specifications in Section 14-9 (2018).
    - Section 14-9-02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- Water or a dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions.
- Soil binder will be spread on any unpaved roads used for construction purposes, and on all project construction parking areas.
- Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions.
- Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by Code of Regulations Title 17, Section 93114.
- A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely re-vegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- Equipment and materials storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly.
- Environmentally sensitive areas will be established near sensitive air receptors. Within these areas, construction

activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible.

- Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used.
- All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust during transportation.
- Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce particulate matter emissions.
- To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown particulate matter in the area.

AQ-2 Prepare and implement a dust control plan to comply with San Joaquin Valley Air Pollution Control District's Regulation VIII requirements to control construction emissions of PM_{10}. To control the generation of construction-related PM_{10} emissions, the project construction contractors will prepare and submit for approval a dust control plan to the San Joaquin Valley Air Pollution Control District at least 30 days prior to any earthmoving or construction activities.

AQ-3 The project will enter into a developer agreement with the San Joaquin Valley Air Pollution Control District and conduct an air impact assessment as required by San Joaquin Valley Air Pollution Control District Rule 9510. Off-site emission reduction fees will be calculated, as dictated by Rule 9510, to reduce construction-related NO_x emissions by 20 percent and PM_{10} exhaust emissions by 45 percent to the statewide fleet average.

Climate Change

Neither the U.S. Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. The Federal Highway Administration emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and executive

orders on climate change, the issue is addressed in the California Environmental Quality Act (CEQA) chapter of this document. The CEQA analysis may be used to inform the National Environmental Policy Act (NEPA) determination for the project.

2.2.3 Noise (and Vibration)

Regulatory Setting

The California Environmental Quality Act and the National Environmental Policy Act of 1969 provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between CEQA and NEPA.

California Environmental Quality Act

CEQA requires a strictly baseline-versus-build analysis to assess whether a proposed project will have a noise impact. If a project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the NEPA/23 Code of Federal Regulations Part 772 (23 CFR 772) noise analysis. See Chapter 3 of this document for further information on noise analysis under CEQA.

National Environmental Policy Act and 23 CFR 772

For highway transportation projects with Federal Highway Administration involvement (and Caltrans, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 Code of Federal Regulations 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The noise abatement criteria differ depending on the type of land use under analysis. For example, the noise abatement criterion for residences 67 A-weighted decibels (dBA) is lower than the noise abatement criterion for commercial areas (72 dBA). **Table 2-16: Noise Abatement Criteria** shows the noise abatement criteria for use in the NEPA/23 CFR 772 analysis.

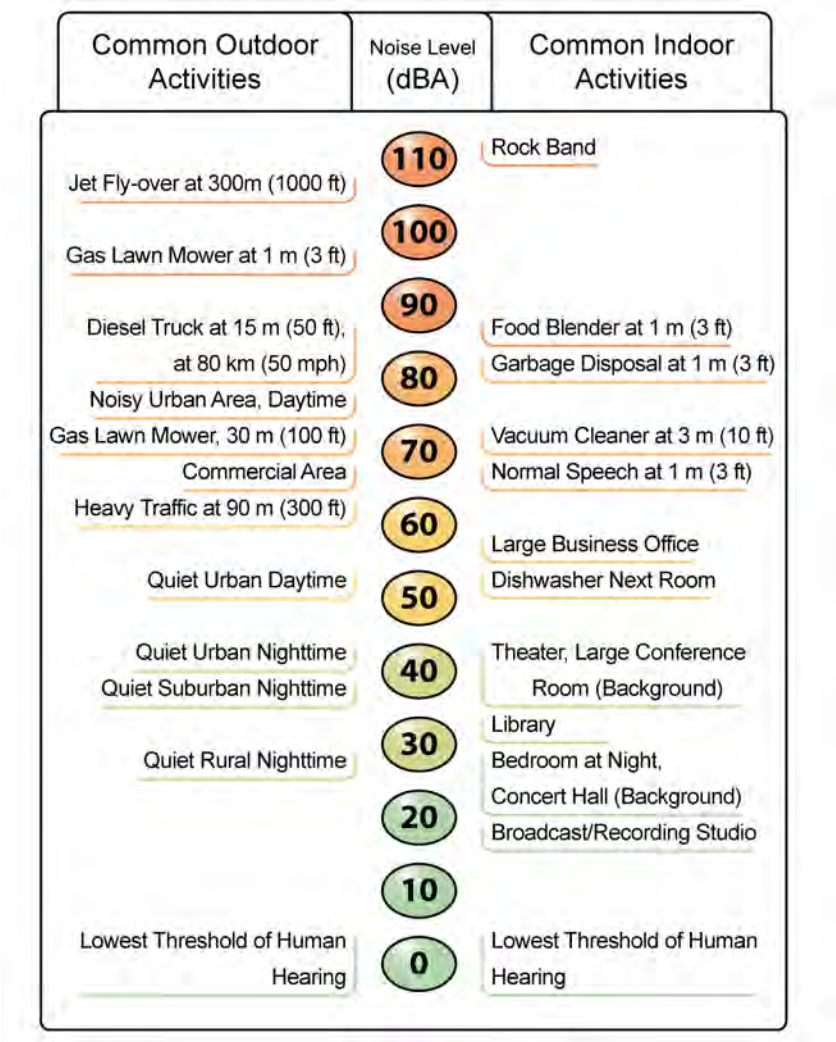
Table 2-16: Noise Abatement Criteria

Activity Category	Noise Abatement Criteria Hourly A-Weighted Noise Level, $L_{eq}(h)$	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting 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 meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	No noise abatement criteria – reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.) and warehousing.
G	No noise abatement criteria – reporting only	Undeveloped lands that are not permitted.

Notes:[1] Includes undeveloped lands permitted for this activity category.

Figure 2-9: Noise Levels of Common Activities lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

Figure 2-9: Noise Levels of Common Activities



According to the Caltrans 2011 Noise Protocol Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the noise abatement criteria. Approaching the noise abatement criteria is defined as coming within 1 dBA of the noise abatement criteria.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Caltrans Traffic Noise Analysis Protocol sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction for all impacted receptors in the future noise levels must be achieved for an abatement to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. Also, a noise reduction of at least 7 dBA must be achieved at one or more benefited receptors for an abatement measure to be considered reasonable.

The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence. In addition, the noise reduction design goal is also used to determine the overall reasonableness of noise abatement. Caltrans' noise reduction design goal is that a barrier must be predicted to provide at least 7 dB of noise reduction at one or more benefited receptors. The cost reasonableness of abatement is determined by calculating a cost allowance that is considered to be a reasonable amount of money to spend on abatement. This reasonable allowance is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance and the abatement will provide at least 7 dB of noise reduction at one or more benefited receptors, then the preliminary determination is that the abatement is reasonable. If the cost estimate is higher than the allowance or if the design goal cannot be achieved, the preliminary determination is that abatement is not reasonable.

Affected Environment

The following analysis is based on the *Noise Study Report* and *Noise Abatement Decision Report, both* dated October 2018 (as listed in the List of Technical Studies at the end of this document) prepared for the project.

Sensitive Land Uses

The project area and surrounding parcels are occupied by a variety of urban uses, agricultural uses and some vacant land. The following land uses were identified in the project area:

- Single-family and multi-family residential units
- Places of worship
- Parks and recreational areas
- Commercial retail uses, industrial uses, warehousing uses and agricultural uses

These land uses were identified through land use maps, aerial photography, and site inspection. Within each land use category, existing sensitive

receptors were identified. The land uses and sensitive receptors in the project area that have been analyzed for potential noise impacts have been grouped into a series of lettered analysis areas. A description of these areas and the sensitive receptors in each area are described as follows:

- **Area A:** Area A is on the north side of State Route 120 between Van Ryn Avenue and Main Street. Single-family residences (Activity Category B) and agricultural uses (Activity Category F) are in this area. This area is generally flat. No sound barrier or topographical shielding occurs between State Route 120 and this area.
- **Area B:** Area B is on the north side of State Route 120 next to Van Ryn Avenue. Several single-family residences (Activity Category B) are in this area. This area is generally flat, except for a steep grade descending from State Route 120. Residences are lower than the highway in this area. The first row of buildings may be topographically shielded from highway noise.
- **Area C:** Area C is on the south side of State Route 120 west of Van Run Avenue. Paseo Villas Apartments, multi-family residential units (Activity Category B) and a park (Activity Category C) are in this area. This area is generally flat, except for a steep grade descending from State Route 120. Residences are lower than the highway. A sound barrier with a nominal height of 10 to 15 feet is between State Route 120 and the residential area.
- **Area D:** Area D is on the south side of State Route 120 at the corner of Van Ryn Avenue and Atherton Drive. The Tesoro Apartments development, multi-family residences (Activity Category B), several outdoor recreation areas (Activity Category C), and a fitness center (Activity Category C) are in this area. This area is generally flat, except for a steep grade descending from State Route 120. Residences are lower than the highway.
- **Area E:** Area E is on the south side of State Route 120 east of Van Ryn Avenue and bordered to the south by Atherton Drive. The Juniper Apartments, multi-family residences (Activity Category B), are in this area. This area is generally flat, except for a steep grade descending from State Route 120. Residences are lower than the highway. A sound barrier with a nominal height of 13 feet stands between State Route 120 and the residential area.
- **Area F:** Area F is on the south side of the State Route 99 southbound on-ramp, northeast of Moffat Boulevard. Commercial uses (Activity Category E) and Crossroads Grace Community Church, a place of worship (Activity Category C), and a small playground (Activity Category C) are in this area. This area is generally flat. There is a gradual grade descending from the on-ramp. No sound barrier or topographical shielding occurs between the State Route 99 and this area.

- **Area G:** Area G is on the northeastern side of the State Route 99 northbound on-ramp and west of Austin Road. Agricultural uses (Activity Category E) and isolated single-family residences (Activity Category B) are in this area. This area is generally flat. No sound barrier or topographical shielding occurs between the State Route 99 and this area.
- **Area H:** Area H is on the northeastern side of the State Route 99 northbound off-ramp and east of Austin Road. Agricultural uses (Activity Category E) and isolated single-family residences (Activity Category B) are in this area. This area is generally flat. No sound barrier or topographical shielding occurs between the highway and this area.
- **Area I:** Area I is south of State Route 99 next to Austin Road. Agricultural uses (Activity Category E) and isolated single-family residences (Activity Category B) are in this area. This area is generally flat. No sound barrier or topographical shielding occurs between the highway and this area.
- **Area J:** Area J is east of State Route 99 next to the frontage road. Agricultural uses (Activity Category E) and isolated single-family residences (Activity Category B) are in this area. This area is generally flat. No sound barrier or topographical shielding occurs between the highway and this area.

Figures 2-10 through **2-12: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barriers (2023)** show the analysis areas, long- and short-term noise monitoring positions, sensitive receptor locations, and potential locations of noise barriers under 2023 conditions. **Figures 2-13** through **2-15: Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barriers (2043)** show the analysis areas, long- and short-term noise monitoring positions, sensitive receptor locations, and potential locations of noise barriers under 2043 conditions.

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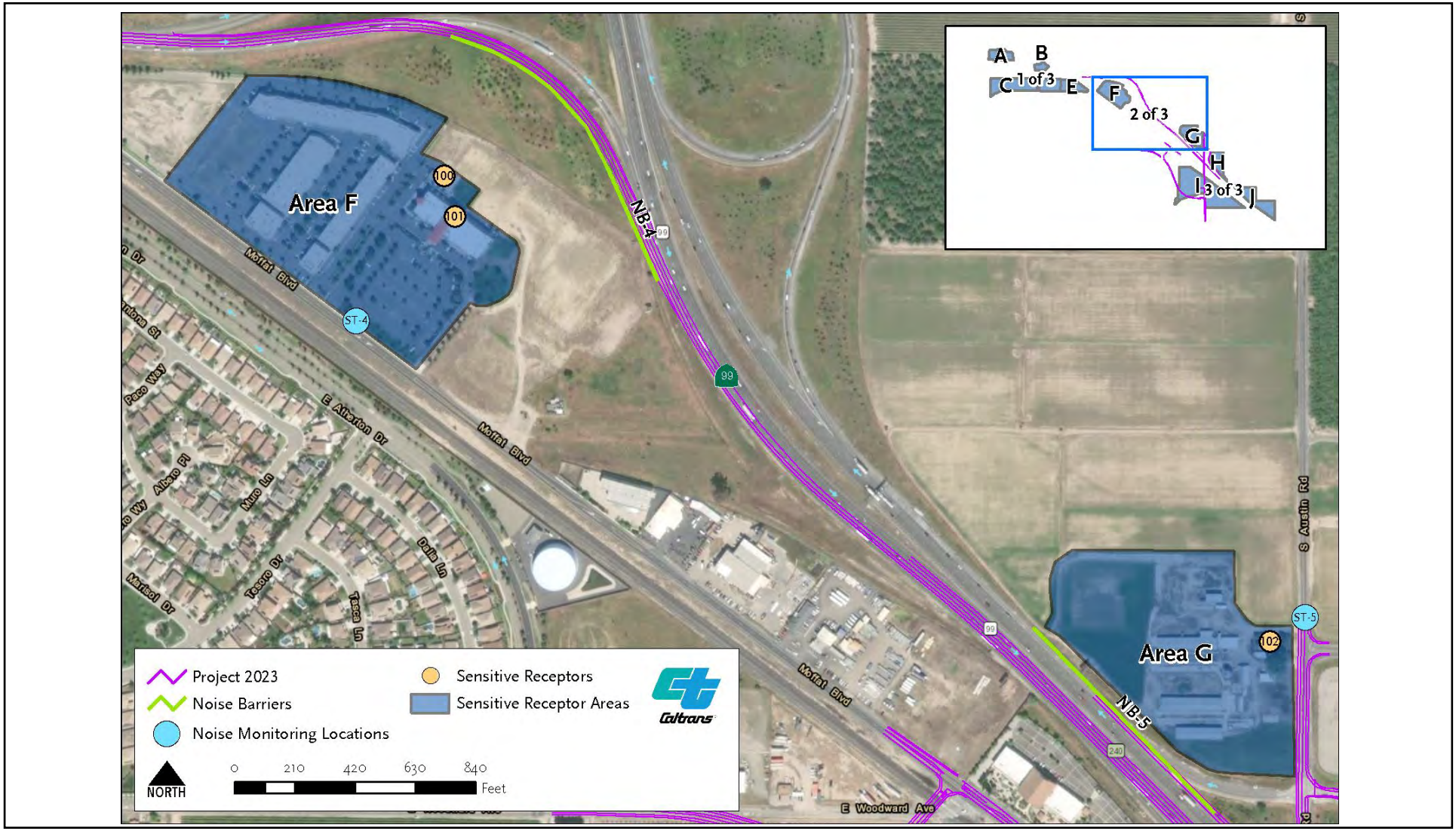
FIGURE 2-10

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2023)

SOURCE: Terry A. Hayes Associates (TAHA) (2018)
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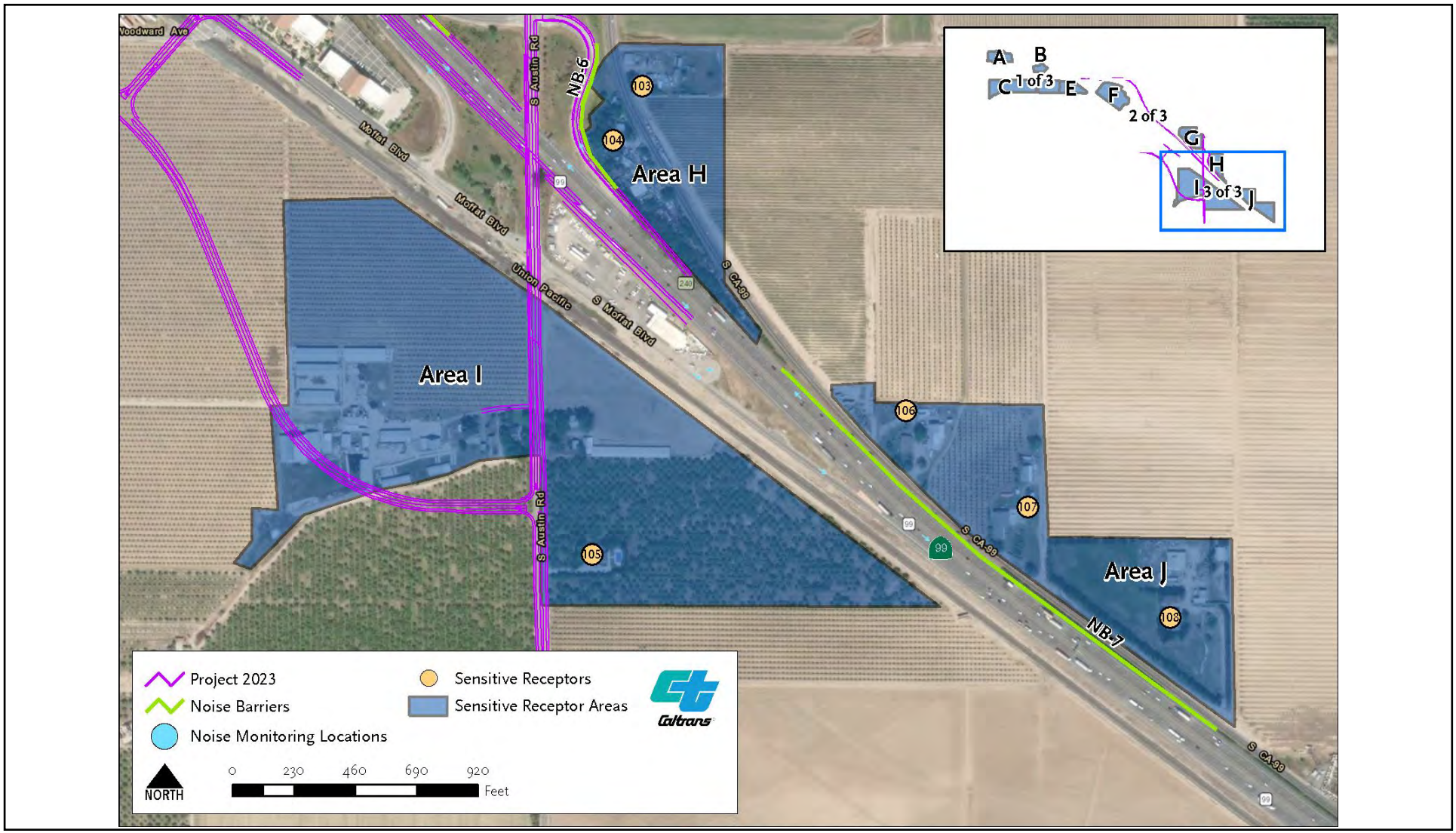
FIGURE 2-11

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaulated Noise Barrier (2023)

SOURCE: Terry A. Hayes Associates (TAHA) (2018)
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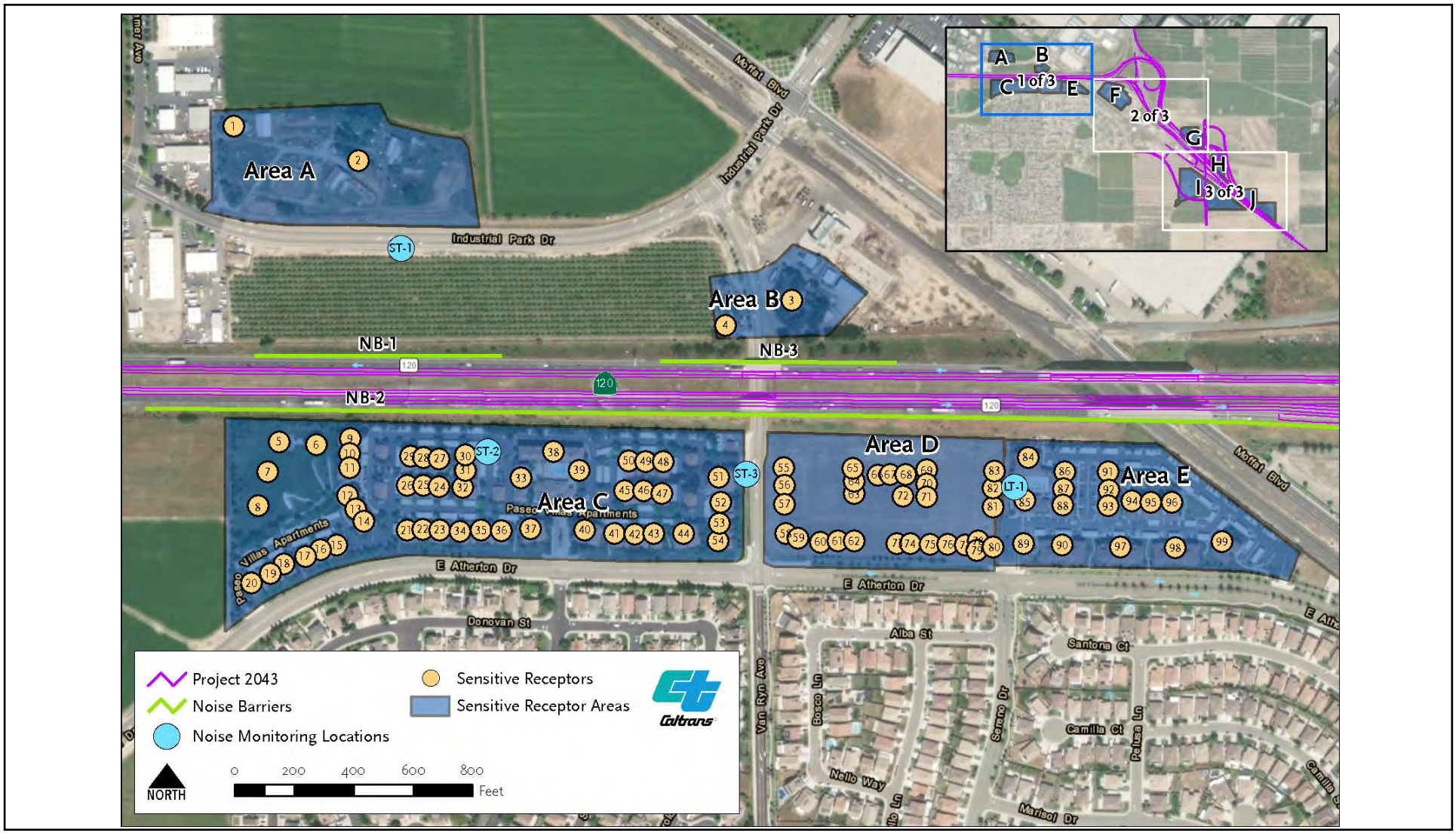
FIGURE 2-12

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Barrier (2023)

SOURCE: Terry A. Hayes Associates (TAHA) (2018)
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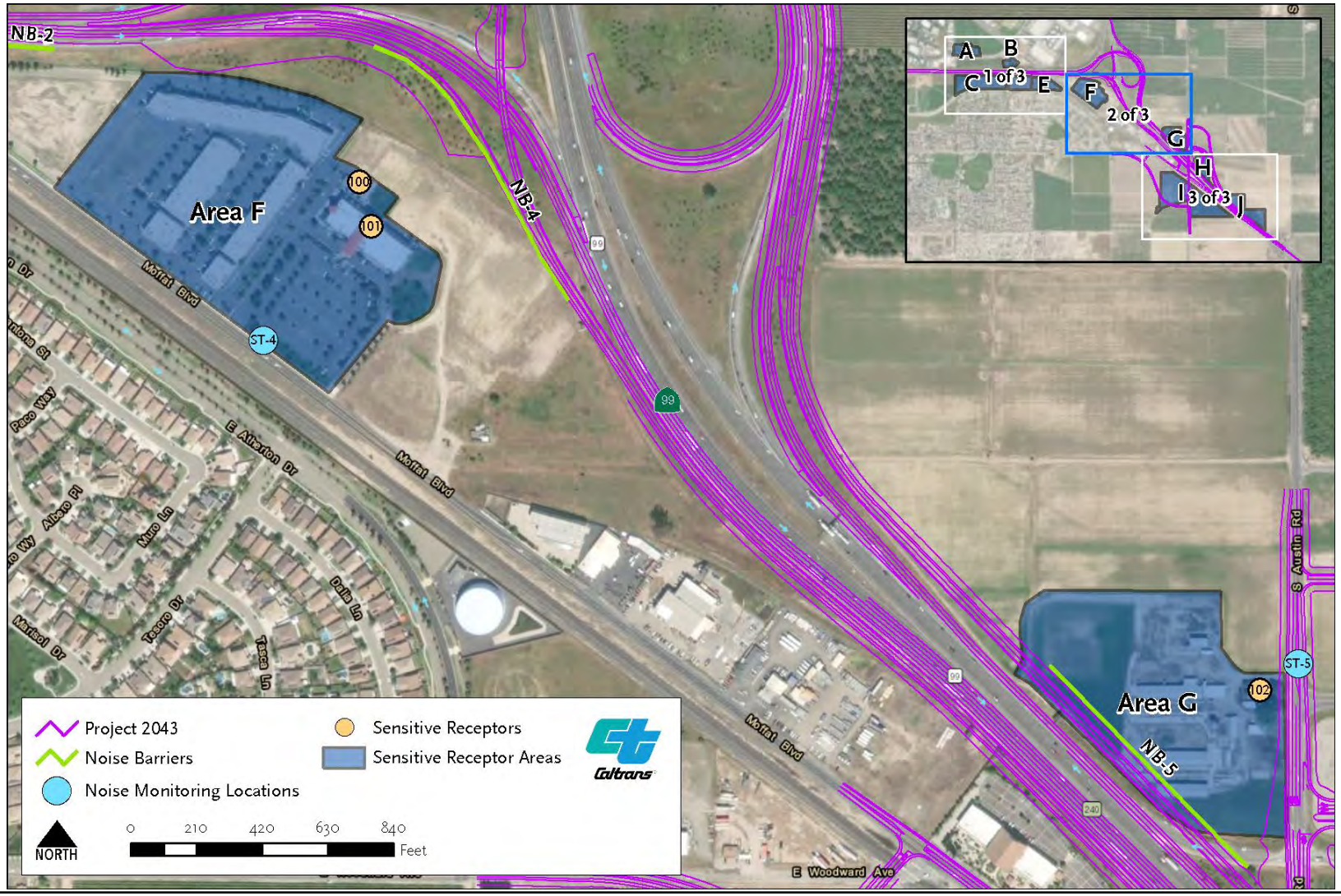
FIGURE 2-13

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2043)

SOURCE: Terry A. Hayes Associates (TAHA) (2018)
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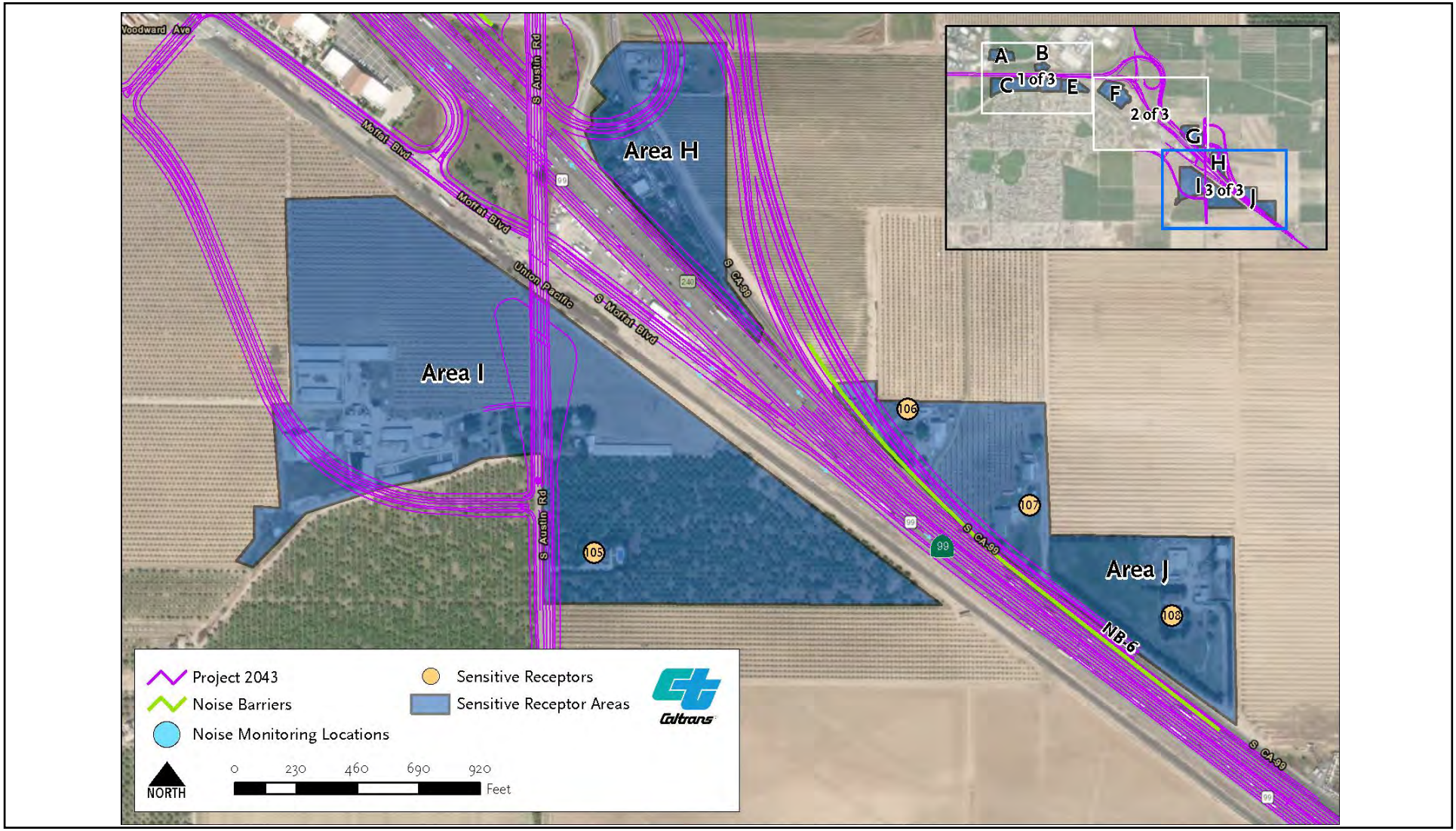
FIGURE 2-14

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2043)

SOURCE: Terry A. Hayes Associates (TAHA) (2018)
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Caltrans

FIGURE 2-15

State Route 99/120 Interchange Connector
in Manteca, San Joaquin County, California
Caltrans District 10, P.M. 3.1/6.2
EA 10-1E740

Analysis Areas, Noise Monitoring Positions, Sensitive Receptor Locations, and Location of Evaluated Noise Barrier (2043)

SOURCE: Terry A. Hayes Associates (TAHA) (2018)
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Existing Ambient Noise Levels in the Project Vicinity

Short-term and long-term 24-hour traffic noise levels were measured to document the existing ambient noise level in the vicinity of the project site.

Short-term noise levels were measured on January 10, 2018 by a qualified noise technician using a SoundPro DL Type 2 Sound Level Meter. **Table 2-17: Summary of Short-Term Measurements** shows the short-term noise measurements at five locations within the project area.

Table 2-17: Summary of Short-Term Measurements

Measurement Number	Measurement Location	Area	Land Use Type	Measured L_{eq}
ST-1	Single-Family Residence (713 Industrial Park Drive)	A	Residential/ Agricultural	70.5
ST-2	Paseo Villas Apartments (801 Atherton Drive)	C	Residential	66.5
ST-3	Paseo Vilas Apartments (801 Atherton Drive) on Van Ryn Avenue	C/B	Residential	71.2
ST-4	Crossroads Grace Community Church (1505 Moffat Boulevard)	E	Church/ Commercial	70
ST-5	Single-Family Residence (20179 Austin Road)	F/G/H	Residential/ Agricultural	70.7

Source: Caltrans, *Noise Study Report, State Route 99/State Route 120 Interchange Project*, September 2018, Table 6-1, pg. 31.
Notes: L_{eq} = equivalent continuous noise level over a specified period of time (acoustical energy of a given measurement)

Table 2-17 shows that the existing ambient noise levels in the project area based on short-term noise monitoring range from a 66.5 to 70.7 dBA equivalent continuous noise level over a specified period of time (acoustical energy of a given measurement) (L_{eq}). The short-term noise measurements were used to calibrate the noise model and predict the noise levels at all 108 modeled receptors in the project area.

Long-term ambient noise monitoring was done with a SoundPro DL Type 2 Sound Level Meter at one location within the project site. Long-term monitoring location LT-1 sat on a landing of an apartment unit at Juniper Apartments at 1201 Atherton Drive in Manteca on the south side of State Route 120, about 235 feet from the State Route 120 edge-of-pavement. The purpose of the long-term monitoring was to gather sound level data over a 24-hour period to determine the ambient daytime and nighttime noise levels within the project site and vicinity and to determine the loudest ambient noise level over a 1-hour period. The long-term noise level was measured over a 24-hour period starting at 1:00 p.m. on Wednesday, January 10, 2018 and

ending at 1:00 p.m. on Thursday, January 11, 2018. **Table 2-18: Summary of Long-Term Monitoring Location at LT-1** shows the hourly L_{eq} noise levels of a 24-hour period during the long-term noise monitoring session.

Table 2-18: Summary of Long-Term Monitoring Location at LT-1

Hours	Start Time	Noise Level (dB(A) L_{eq})
1	2:00 p.m.	61.9
2	3:00 p.m.	62.2
3	4:00 p.m.	62.2
4	5:00 p.m.	61.1
5	6:00 p.m.	60.2
6	7:00 p.m.	60.1
7	8:00 p.m.	60.9
8	9:00 p.m.	60
9	10:00 p.m.	59.2
10	11:00 p.m.	58.3
11	12:00 a.m.	58.7
12	1:00 a.m.	57.6
13	2:00 a.m.	57.3
14	3:00 a.m.	57
15	4:00 a.m.	58.6
16	5:00 a.m.	59.9
17	6:00 a.m.	61.2
18	7:00 a.m.	61.6
19	8:00 a.m.	63.2
20	9:00 a.m.	65.2
21	10:00 a.m.	64.7
22	11:00 a.m.	**71.1**
23	12:00 p.m.	69.3
24	1:00 p.m.	64.1

Source: Caltrans, Noise Study Report, State Route 99/State Route 120 Interchange Project, September 2018, Table 6-2, pg. 32.
Notes: Worst noise hour level is bolded. As shown above in **Table 2-18**, the long-term noise levels ranged from a low of 57.0 dB(A) to a high of 71.1 dB(A) L_{eq}.

Existing Noise Levels at Modeled Receptor Locations

As described above, the project site is in an area with the following uses: residential, agricultural, outdoor recreation areas, parks, places of worship, and playgrounds. The existing noise levels were determined at 108 modeled receptor locations around the project site. Existing noise levels at the 108 modeled receptor locations range from a low of 61 dBA L_{eq}(h) (hourly A-weighted noise level at receptors 8, 79, 80, and 105) to a high of 75 dBA L_{eq}(h) (at receptors 106 and 107).

Environmental Consequences

As defined by 23 CFR 772, the proposed project is considered a Type I project as the Build Alternative would add an additional lane to each of the connectors and replace the Austin Road Overcrossing.

Short-term Construction Noise Analysis

Short-term noise impacts are related to noise generated during each phase of construction. Development of the project would include distinct construction activities where different types of construction equipment would be used, and the location of such equipment would change daily at the project site. **Table 2-19: Construction Equipment Noise** shows the different types of construction equipment that are commonly used on similar roadway projects and the estimated maximum noise level as measured from 50 feet away.

Table 2-19: Construction Equipment Noise

Equipment	Maximum Noise Level (dBA, L_{eq} at 50 feet)
Auger Drill	77.4
Backhoe	73.6
Compressor (air)	73.7
Concrete Mixer Truck	74.8
Concrete Pump Truck	74.4
Concrete Saw	82.6
Crane	72.6
Dump Truck	72.5
Excavator	76.7
Front End Loader	75.1
Generator	77.6
Gradall	79.4
Grader	81
Impact Pile Driver	94.3
Man Lift	67.7
Mounted Impact Hammer (hoe ram)	83.3
Paver	74.2
Pneumatic Tools	82.2
Roller	73
Scraper	79.6
Tractor	80
Vacuum Street Sweeper	71.6

Source: Caltrans, Noise Study Report, State Route 99/State Route 120 Interchange Project, September 2018, Table 8-1, pg. 65.

Construction equipment is expected to generate noise levels ranging from 67.7 to 94.3 dB at a distance of 50 feet, and noise produced by construction equipment would be reduced over distance at a rate of about 6 dB per doubling of distance.

Construction noise at off-site receptor locations would depend on the loudest piece of equipment operating. Most noise sensitive receptors (single-family residential units) identified for the project and those most affected by construction noise are south of State Route 120 and west of State Route 99, or near the frontage road. Due to the proximity of these receptors to both State Route 99 and State Route 120, construction noise is anticipated to be overshadowed by traffic noise.

Construction activities would be temporary and occur mostly during normal daytime hours. The City of Manteca's noise ordinance allows construction activities during the hours of 7:00 a.m. to 7:00 p.m. If construction activities occur outside of these hours, coordination with the City, including potential measures to reduce noise levels, would be required. Some construction activities may require limited work during nighttime hours. A variance or waiver would be required from the City prior to the start of construction activities during nighttime hours. Impact pile driving would occur only during daytime hours, which would reduce the potential for impacts at sensitive receptors.

Construction noise would be short term, intermittent, and overshadowed by local traffic noise. Implementing the standard measure **NOI-1** would avoid and/or minimize construction noise impacts. Implementation of the standard measure **NOI-1** and Caltrans Standard Specification Section 14.8-02 would ensure that sensitive receptors near project construction would not be adversely affected by construction noise.

Operational

A Noise Study Report was prepared for the project to determine the future traffic noise impacts predicted at the 108 modeled receptor locations of the project. **Table 2-20: Operational Noise Levels at Modeled Receptor Locations (Construction Year 2023)** summarizes the traffic noise modeling results for existing conditions and construction year 2023 (Phase 1A) conditions with and without the project. **Table 2-21: Operational Noise Levels at Modeled Receptor Locations (Design Year 2043)** summarizes the traffic noise modeling results for existing conditions and design year 2043 (Phases 1A, 1B, and 1C) conditions with and without the project. Predicted construction year 2023 and design year 2043 traffic noise levels with the project are compared to existing conditions and to construction year and design year no-project conditions. The comparison to existing conditions is included in the analysis to identify traffic noise impacts as defined under 23 CFR 772.

Table 2-20: Operational Noise Levels at Modeled Receptor Locations (Construction Year 2023)

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) $L_{eq}(h)$	2023 Noise Level without Project dB(A) $L_{eq}(h)$	2023 Noise Level with Project dB(A) $L_{eq}(h)$	2023 Noise Level with Project minus No Project Conditions	2023 Noise Level with Project Minus Existing Conditions
1	**A**	1	711 Industrial Park Dr.	Residential	None	64	64	64	0	0
2		1	713 Industrial Park Dr.	Residential	A/E	66	66	66	0	0
3	**B**	1	1252 Van Ryn Ave.	Residential	A/E	66	66	66	0	0
4		1	1255 Van Ryn Ave.	Residential	A/E	68	68	68	0	0
5		None	801 Atherton Dr.	Park	A/E	65	65	66	1	1
6		None	801 Atherton Dr.	Park	A/E	65	66	66	0	1
7		None	801 Atherton Dr.	Park	None	63	63	64	1	1
8		None	801 Atherton Dr.	Park	None	61	61	61	0	0
9		6	801 Atherton Dr.	Residential	A/E	72	72	73	1	1
10		12	801 Atherton Dr.	Residential	A/E	71	71	71	0	0
11		6	801 Atherton Dr.	Residential	A/E	70	70	70	0	0
12		4	801 Atherton Dr.	Residential	A/E	67	67	68	1	1
13		8	801 Atherton Dr.	Residential	A/E	66	66	67	1	1
14		4	801 Atherton Dr.	Residential	A/E	65	66	66	0	1
15		4	801 Atherton Dr.	Residential	None	64	64	64	0	0
16	**C**	8	801 Atherton Dr.	Residential	None	63	64	64	0	1
17		4	801 Atherton Dr.	Residential	None	63	63	64	1	1
18		4	801 Atherton Dr.	Residential	None	63	63	63	0	0
19		8	801 Atherton Dr.	Residential	None	62	62	63	1	1
20		4	801 Atherton Dr.	Residential	None	62	62	62	0	0
21		4	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
22		8	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
23		4	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
24		4	801 Atherton Dr.	Residential	A/E	68	68	69	1	1
25		8	801 Atherton Dr.	Residential	A/E	68	68	69	1	1
26		4	801 Atherton Dr.	Residential	A/E	68	68	69	1	1
27		6	801 Atherton Dr.	Residential	A/E	70	71	71	0	1

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2023 Noise Level without Project dB(A) L_{eq}(h)	2023 Noise Level with Project dB(A) L_{eq}(h)	2023 Noise Level with Project minus No Project Conditions	2023 Noise Level with Project Minus Existing Conditions
28		12	801 Atherton Dr.	Residential	A/E	70	71	71	0	1
29		6	801 Atherton Dr.	Residential	A/E	70	70	71	1	1
30		6	801 Atherton Dr.	Residential	A/E	71	71	71	0	0
31		12	801 Atherton Dr.	Residential	A/E	70	70	70	0	0
32		6	801 Atherton Dr.	Residential	A/E	69	69	69	0	0
33		8	801 Atherton Dr.	Residential	A/E	69	69	70	1	1
34		4	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
35		8	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
36		4	801 Atherton Dr.	Residential	A/E	65	66	66	0	1
37		6	801 Atherton Dr.	Residential	A/E	66	66	66	0	0
38		14	801 Atherton Dr.	Residential	A/E	71	71	72	1	1
39		3	801 Atherton Dr.	Residential	A/E	70	70	70	0	0
40		6	801 Atherton Dr.	Residential	A/E	66	66	66	0	0
41		4	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
42		8	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
43		4	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
44		8	801 Atherton Dr.	Residential	A/E	65	65	66	1	1
45		4	801 Atherton Dr.	Residential	A/E	68	68	69	1	1
46		8	801 Atherton Dr.	Residential	A/E	67	68	68	0	1
47		4	801 Atherton Dr.	Residential	A/E	67	67	68	1	1
48		6	801 Atherton Dr.	Residential	A/E	70	70	71	1	1
49		12	801 Atherton Dr.	Residential	A/E	70	70	71	1	1
50		6	801 Atherton Dr.	Residential	A/E	70	70	71	1	1
51		8	801 Atherton Dr.	Residential	A/E	73	74	75	1	2
52		4	801 Atherton Dr.	Residential	A/E	72	72	73	1	1
53		8	801 Atherton Dr.	Residential	A/E	71	71	72	1	1
54		4	801 Atherton Dr.	Residential	A/E	70	70	71	1	1
55	**D**	6	1005 Atherton Dr.	Residential	A/E	70	70	71	1	1
56		14	1005 Atherton Dr.	Residential	A/E	69	69	70	1	1

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2023 Noise Level without Project dB(A) L_{eq}(h)	2023 Noise Level with Project dB(A) L_{eq}(h)	2023 Noise Level with Project minus No Project Conditions	2023 Noise Level with Project Minus Existing Conditions
57		6	1005 Atherton Dr.	Residential	A/E	68	68	69	1	1
58		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
59		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
60		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
61		8	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
62		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
63		6	1005 Atherton Dr.	Residential	A/E	69	69	69	0	0
64		6	1005 Atherton Dr.	Residential	A/E	70	70	70	0	0
65		6	1005 Atherton Dr.	Residential	A/E	71	71	71	0	0
66		6	1005 Atherton Dr.	Residential	A/E	71	71	71	0	0
67		6	1005 Atherton Dr.	Residential	A/E	71	71	71	0	0
68		6	1005 Atherton Dr.	Residential	A/E	71	71	71	0	0
69		6	1005 Atherton Dr.	Residential	A/E	71	71	71	0	0
70		6	1005 Atherton Dr.	Residential	A/E	70	70	70	0	0
71		6	1005 Atherton Dr.	Residential	A/E	69	69	69	0	0
72		1	1005 Atherton Dr.	Pool	None	63	64	64	0	1
73		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
74		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
75		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
76		8	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
77		4	1005 Atherton Dr.	Residential	A/E	65	65	66	1	1
78		1	1005 Atherton Dr.	Playground	None	62	62	63	1	1
79		1	1005 Atherton Dr.	Playground	None	61	62	62	0	1
80		1	1005 Atherton Dr.	Fitness Center	None	61	62	62	0	1
81		6	1005 Atherton Dr.	Residential	A/E	68	68	69	1	1
82		14	1005 Atherton Dr.	Residential	A/E	69	69	70	1	1
83		6	1005 Atherton Dr.	Residential	A/E	70	71	71	0	1
84	**E**	8	120 Atherton Dr.	Residential	A/E	67	67	68	1	1
85		1	120 Atherton Dr.	Residential	A/E	66	66	67	1	1

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2023 Noise Level without Project dB(A) L_{eq}(h)	2023 Noise Level with Project dB(A) L_{eq}(h)	2023 Noise Level with Project minus No Project Conditions	2023 Noise Level with Project Minus Existing Conditions
86		9	120 Atherton Dr.	Residential	A/E	70	70	71	1	1
87		9	120 Atherton Dr.	Residential	A/E	69	69	70	1	1
88		9	120 Atherton Dr.	Residential	A/E	68	68	69	1	1
89		2	120 Atherton Dr.	Residential	A/E	65	65	66	1	1
90		18	120 Atherton Dr.	Residential	A/E	66	66	67	1	1
91		8	120 Atherton Dr.	Residential	A/E	70	71	71	0	1
92		9	120 Atherton Dr.	Residential	A/E	69	69	70	1	1
93		9	120 Atherton Dr.	Residential	A/E	68	68	69	1	1
94		9	120 Atherton Dr.	Residential	A/E	68	69	69	0	1
95		9	120 Atherton Dr.	Residential	A/E	69	69	69	0	0
96		9	120 Atherton Dr.	Residential	A/E	69	69	69	0	0
97		18	120 Atherton Dr.	Residential	A/E	66	66	67	1	1
98		18	120 Atherton Dr.	Residential	A/E	67	67	67	0	0
99		8	120 Atherton Dr.	Residential	A/E	65	65	66	1	1
100	F	None	1505 Moffat Blvd.	Playground	None	62	63	63	0	1
101		None	1505 Moffat Blvd.	Church	A/E	66	66	67	1	1
102	**G**	1	20179 Austin Rd.	Residential	A/E	64	65	67	2	3
103	**H**	1	20270 99 Frontage Rd.	Residential	A/E	72	72	73	1	1
104		1	20405 99 Frontage Rd.	Residential	A/E	66	66	67	1	1
105	I	1	20700 Austin Rd.	Residential	None	61	62	63	1	2
106	**J**	1	20782 99 Frontage Rd.	Residential	A/E	75	75	75	0	0
107		1	20782 99 Frontage Rd.	Residential	A/E	75	75	75	0	0
108		1	20900 99 Frontage Rd.	Residential	A/E	69	69	69	0	0

Source: Noise Study Report, State Route 99/State Route 120 Interchange Project, September 2018, Table B-1 and B-2, pgs. 65 to 89.
Notes: All noise abatement criteria are exterior unless noted. N/A = sensitive receptor has been removed. **Bold** indicates noise level approaches or exceeds noise abatement criteria. Blvd. = Boulevard, Dr. = Drive, Rd. = Road

Table 2-21: Operational Noise Levels at Modeled Receptor Locations (Design Year 2043)

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2043 Noise Level without Project dB(A) L_{eq}(h)	2043 Noise Level with Project dB(A) L_{eq}(h)	2043 Level with Project minus No Project Conditions	2043 Level with Project Minus Existing Conditions
1	A	1	711 Industrial Park Dr.	Residential	A/E	64	65	67	2	3
2		1	713 Industrial Park Dr.	Residential	A/E	66	67	69	2	3
3	B	1	1252 Van Ryn Ave.	Residential	A/E	66	67	68	1	2
4		1	1255 Van Ryn Ave.	Residential	A/E	68	69	69	0	1
5	C	None	801 Atherton Dr.	Park	A/E	65	65	66	1	1
6		None	801 Atherton Dr.	Park	A/E	65	66	68	2	3
7		None	801 Atherton Dr.	Park	A/E	63	64	66	2	3
8		None	801 Atherton Dr.	Park	None	61	62	63	1	2
9		6	801 Atherton Dr.	Residential	A/E	72	73	74	1	2
10		12	801 Atherton Dr.	Residential	A/E	71	72	73	1	2
11		6	801 Atherton Dr.	Residential	A/E	70	71	72	1	2
12		4	801 Atherton Dr.	Residential	A/E	67	68	69	1	2
13		8	801 Atherton Dr.	Residential	A/E	66	67	69	2	3
14		4	801 Atherton Dr.	Residential	A/E	65	67	68	1	3
15		4	801 Atherton Dr.	Residential	A/E	64	65	67	2	3
16		8	801 Atherton Dr.	Residential	A/E	63	65	67	2	4
17		4	801 Atherton Dr.	Residential	A/E	63	64	66	2	3
18		4	801 Atherton Dr.	Residential	A/E	63	64	66	2	3
19		8	801 Atherton Dr.	Residential	A/E	62	63	66	3	4
20		4	801 Atherton Dr.	Residential	None	62	63	65	2	3
21		4	801 Atherton Dr.	Residential	A/E	65	66	68	2	3
22		8	801 Atherton Dr.	Residential	A/E	65	66	68	2	3
23		4	801 Atherton Dr.	Residential	A/E	65	66	68	2	3
24		4	801 Atherton Dr.	Residential	A/E	68	69	70	1	2
25		8	801 Atherton Dr.	Residential	A/E	68	69	70	1	2
26		4	801 Atherton Dr.	Residential	A/E	68	69	70	1	2
27		6	801 Atherton Dr.	Residential	A/E	70	72	73	1	3

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2043 Noise Level without Project dB(A) L_{eq}(h)	2043 Noise Level with Project dB(A) L_{eq}(h)	2043 Level with Project minus No Project Conditions	2043 Level with Project Minus Existing Conditions
28		12	801 Atherton Dr.	Residential	A/E	70	72	73	1	3
29		6	801 Atherton Dr.	Residential	A/E	70	71	73	2	3
30		6	801 Atherton Dr.	Residential	A/E	71	72	73	1	2
31		12	801 Atherton Dr.	Residential	A/E	70	71	72	1	2
32		6	801 Atherton Dr.	Residential	A/E	69	70	71	1	2
33		8	801 Atherton Dr.	Residential	A/E	69	70	71	1	2
34		4	801 Atherton Dr.	Residential	A/E	65	66	68	2	3
35		8	801 Atherton Dr.	Residential	A/E	65	67	68	1	3
36		4	801 Atherton Dr.	Residential	A/E	65	67	68	1	3
37		6	801 Atherton Dr.	Residential	A/E	66	67	68	1	2
38		14	801 Atherton Dr.	Residential	A/E	71	72	73	1	2
39		3	801 Atherton Dr.	Residential	A/E	70	71	72	1	2
40		6	801 Atherton Dr.	Residential	A/E	66	67	68	1	2
41		4	801 Atherton Dr.	Residential	A/E	65	67	68	1	3
42		8	801 Atherton Dr.	Residential	A/E	65	67	68	1	3
43		4	801 Atherton Dr.	Residential	A/E	65	66	68	2	3
44		8	801 Atherton Dr.	Residential	A/E	65	66	68	2	3
45		4	801 Atherton Dr.	Residential	A/E	68	69	70	1	2
46		8	801 Atherton Dr.	Residential	A/E	67	69	70	1	3
47		4	801 Atherton Dr.	Residential	A/E	67	68	70	2	3
48		6	801 Atherton Dr.	Residential	A/E	70	72	73	1	3
49		12	801 Atherton Dr.	Residential	A/E	70	72	72	0	2
50		6	801 Atherton Dr.	Residential	A/E	70	72	73	1	3
51		8	801 Atherton Dr.	Residential	A/E	73	75	75	0	2
52		4	801 Atherton Dr.	Residential	A/E	72	73	74	1	2
53		8	801 Atherton Dr.	Residential	A/E	71	72	73	1	2
54		4	801 Atherton Dr.	Residential	A/E	70	71	73	2	3
55	D	6	1005 Atherton Dr.	Residential	A/E	70	71	72	1	2
56		14	1005 Atherton Dr.	Residential	A/E	69	71	71	0	2
57		6	1005 Atherton Dr.	Residential	A/E	68	69	70	1	2

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2043 Noise Level without Project dB(A) L_{eq}(h)	2043 Noise Level with Project dB(A) L_{eq}(h)	2043 Level with Project minus No Project Conditions	2043 Level with Project Minus Existing Conditions
58		4	1005 Atherton Dr.	Residential	A/E	65	67	68	1	3
59		4	1005 Atherton Dr.	Residential	A/E	65	66	68	2	3
60		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
61		8	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
62		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
63		6	1005 Atherton Dr.	Residential	A/E	69	70	71	1	2
64		6	1005 Atherton Dr.	Residential	A/E	70	71	72	1	2
65		6	1005 Atherton Dr.	Residential	A/E	71	72	73	1	2
66		6	1005 Atherton Dr.	Residential	A/E	71	72	73	1	2
67		6	1005 Atherton Dr.	Residential	A/E	71	72	73	1	2
68		6	1005 Atherton Dr.	Residential	A/E	71	72	73	1	2
69		6	1005 Atherton Dr.	Residential	A/E	71	72	73	1	2
70		6	1005 Atherton Dr.	Residential	A/E	70	71	72	1	2
71		6	1005 Atherton Dr.	Residential	A/E	69	70	71	1	2
72		1	1005 Atherton Dr.	Pool	A/E	63	64	66	2	3
73		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
74		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
75		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
76		8	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
77		4	1005 Atherton Dr.	Residential	A/E	65	66	67	1	2
78		1	1005 Atherton Dr.	Playground	None	62	63	64	1	2
79		1	1005 Atherton Dr.	Playground	None	61	62	63	1	2
80		1	1005 Atherton Dr.	Fitness Center	None	61	63	64	1	3
81		6	1005 Atherton Dr.	Residential	A/E	68	69	70	1	2
82		14	1005 Atherton Dr.	Residential	A/E	69	70	71	1	2
83		6	1005 Atherton Dr.	Residential	A/E	70	72	72	0	2
84	E	8	120 Atherton Dr.	Residential	A/E	67	68	69	1	2
85		1	120 Atherton Dr.	Residential	A/E	66	67	67	0	1
86		9	120 Atherton Dr.	Residential	A/E	70	71	72	1	2
87		9	120 Atherton Dr.	Residential	A/E	69	70	71	1	2

Receptor I.D.	Area	Number of Dwelling Units	Location	Land Use	Impact Type	Existing Noise Level dB(A) L_{eq}(h)	2043 Noise Level without Project dB(A) L_{eq}(h)	2043 Noise Level with Project dB(A) L_{eq}(h)	2043 Level with Project minus No Project Conditions	2043 Level with Project Minus Existing Conditions
88		9	120 Atherton Dr.	Residential	A/E	68	69	70	1	2
89		2	120 Atherton Dr.	Residential	A/E	65	66	66	0	1
90		18	120 Atherton Dr.	Residential	A/E	66	67	68	1	2
91		8	120 Atherton Dr.	Residential	A/E	70	72	72	0	2
92		9	120 Atherton Dr.	Residential	A/E	69	70	71	1	2
93		9	120 Atherton Dr.	Residential	A/E	68	69	70	1	2
94		9	120 Atherton Dr.	Residential	A/E	68	70	70	0	2
95		9	120 Atherton Dr.	Residential	A/E	69	70	71	1	2
96		9	120 Atherton Dr.	Residential	A/E	69	70	71	1	2
97		18	120 Atherton Dr.	Residential	A/E	66	67	68	1	2
98		18	120 Atherton Dr.	Residential	A/E	67	68	68	0	1
99		8	120 Atherton Dr.	Residential	A/E	65	66	66	0	1
100	F	None	1505 Moffat Blvd.	Playground	None	62	63	62	-1	0
101		None	1505 Moffat Blvd.	Church	A/E	66	66	67	1	1
102	G	1	20179 Austin Rd.	Residential	A/E	64	66	69	3	5
103	H	1	20270 99 Frontage Rd.	Residential	N/A	72	N/A	N/A	N/A	N/A
104		1	20405 99 Frontage Rd.	Residential	N/A	66	N/A	N/A	N/A	N/A
105	I	1	20700 Austin Rd.	Residential	None	61	63	63	0	2
106	J	1	20782 99 Frontage Rd.	Residential	A/E	75	74	70	-4	-5
107		1	20782 99 Frontage Rd.	Residential	A/E	75	74	68	-6	-7
108		1	20900 99 Frontage Rd.	Residential	A/E	69	68	68	0	-1

Notes: All noise abatement criteria are exterior unless noted. A/E = Future noise conditions approach or exceed the Noise Abatement Criteria; N/A = sensitive receptor has been removed. Bold = Receptor I.D.'s that are approaching or exceeding noise abatement criteria. Ave. = Avenue, Blvd. = Boulevard, Dr. = Drive, Rd. = Road

The modeled future noise levels with the project were compared to the modeled existing noise levels to determine whether a substantial noise increase would occur (a noise increase above 12 dBA is considered substantial). The modeled future noise levels for the project were also compared to the noise abatement criteria for Activity Category B (Residential not to exceed an exterior noise level of 67 L_{eq}[h]); Activity Category E (retail not to exceed an exterior noise level of 72 L_{eq}[h]); and, Activity Categories F and G (Agricultural and Vacant where there is No Noise Abatement Criteria-Reporting Only).

Following is the analysis for the sensitive receptors in each area under the construction year 2023 scenario and the design year 2043 scenario.

Construction Year 2023 (Phase 1A) Analysis

This section provides an assessment of the changes in noise levels within the project vicinity from existing conditions to construction year 2023. This section compares the impacts of construction year 2023 with the project versus construction year 2023 without the project. The Noise Study Report and the Noise Abatement Decision Report (as listed in the List of Technical Studies at the end of this document), dated October 2018, contributed to the information and analysis in this section.

Modeling results indicated that predicted traffic noise levels under construction year 2023 (Phase 1A) would approach or exceed the noise abatement criterion of 67 dBA-L_{eq}(h) (A-weighted equivalent sound level) for Activity Category B (residential) and Activity Category C (parks and places of worship) land uses. Noise levels at these land uses are predicted to range from 61 to 75 dBA-L_{eq}(h) during construction year 2023 (Phase 1A). None of the sensitive receptors in Areas A, B, C, D, E, F, G H, I, and J would be exposed to a noise increase at or exceeding 12 dBA when compared under existing conditions versus construction year 2023 (Phase 1A) conditions.

Residential land uses in Areas A (Receptor ID #2), B (Receptor IDs #3, #4), C (Receptor IDs #5, 6, 9-14; 21-54), D (Receptor IDs #55-71; 73-77; 81, 82, 83), E (Receptor IDs #84-99), G (Receptor ID #102), H (Receptor IDs #103, 104) and J (Receptor IDs #106, 107, 108) as well as the exterior of the church in Area F (Receptor ID #101) would be exposed to noise levels approaching or exceeding the noise abatement criterion of 67 dBA-L_{eq}(h) under construction year 2023 with project (Phase 1A) conditions. Noise abatement measures would be considered for the sensitive receptors in Areas A, B, C, D, E, G, H, and J as well as the church in Area F.

Residential land uses in Area I and the playground in Area F would not be exposed to noise levels approaching or exceeding the noise abatement criterion of 67 dBA-L_{eq}(h) under construction year 2023 with project (Phase 1A) conditions, so noise abatement would not be considered for the residential uses in Area I and the playground in Area F. The interior noise

level at the church in Area F is predicted to be below the noise abatement criterion of 52 dBA L_{eq}(h) under construction year 2023 with project (Phase 1A) conditions, so no noise abatement measures to reduce interior noise levels at the church would be required.

Design Year 2043 (Phases 1A, 1B, and 1C) Analysis

This section provides an assessment of the changes in noise levels within the project vicinity from existing conditions to design year 2043. This section analyzes the impacts of Phase 1A, Phase 1B, and Phase 1C of the project. The Noise Study Report and the Noise Abatement Decision Report (as listed in the List of Technical Studies at the end of this document), dated October 2018, contributed to the information and analysis in this section.

Modeling results indicated that predicted traffic noise levels under design year 2043 (Phases 1A, 1B, and 1C) would approach or exceed the noise abatement criterion of 67 dBA-L_{eq}(h) (A-weighted equivalent sound level) for Activity Category B (residential) and Activity Category C (parks and places of worship) land uses. Noise levels at these land uses are predicted to range from 62 to 72 dBA-L_{eq}(h) during design year 2043 (Phases 1A, 1B, and 1C). None of the sensitive receptors in Areas A, B, C, D, E, F, G, H, I, and J would be exposed to noise increases at or exceeding 12 dBA when compared under existing conditions versus design year 2043 (Phases 1A, 1B, and 1C) conditions.

Residential land uses in Area I and the playground in Area F would not be exposed to noise levels approaching or exceeding the noise abatement criterion of 67 dBA-L_{eq}(h) under design year 2043 with project (Phases 1A, 1B, and 1C) conditions, so noise abatement would not be considered for the residential uses in Area I or the playground in Area F. The interior noise level at the church in Area F is predicted to be below the noise abatement criterion of 52 dBA L_{eq}(h) under design year 2043 with project (Phases 1A, 1B, and 1C) conditions, so no noise abatement measures to reduce interior noise levels at the church would be required. The uses in Area H (Receptor IDs #103 and #104) would be fully acquired as part of the project in the design year, so they would not be subject to noise impacts.

Residential land uses in Areas A (Receptor IDs #1 and 2), B (Receptor IDs #3 and 4), C (Receptor IDs #5-19; 21-54), D (Receptor IDs #55-77; 81, 82, 83), E (Receptor IDs #84-99), G (Receptor ID #102), and J (Receptor IDs #106, 107, and 108) as well as the exterior of the church and the playground in Area F (Receptor IDs #100 and 101) would be exposed to noise levels approaching or exceeding the noise abatement criterion of 67 dBA-L_{eq}(h) under design year 2043 with project (Phase 1A) conditions. Noise abatement measures would be considered for the sensitive receptors in Areas A, B, C, D, E, G, and J as well as the exterior of the church in Area F.

Noise Abatement Consideration for Construction Year 2023 and Design Year 2043 Conditions

Noise abatement measures such as noise barriers were considered to shield receivers in the project area, where receptors would be or would continue to be exposed to traffic noise levels approaching or exceeding the noise abatement criteria. Modeling results indicated that predicted traffic noise levels under construction year 2023 and design year 2043 conditions would approach or exceed the noise abatement criterion of 67 dBA-L_{eq}(h) for Activity Category B land uses and for Activity Category C land uses at parks and places of worship. Noise barriers were analyzed for receptor locations in Areas B, C, D, E, F, G, H and J under construction year 2023 with project conditions and Areas A, B, C, D, E, F, and G under design year 2043 with project conditions. Depending on the location of the potential receptor and existing barrier height, noise barriers from 6 to 16 feet high were analyzed. Locations of the noise barriers are shown in **Figures 2-10 to 2-15**.

The following noise barriers were analyzed to shield receptor locations that would be exposed to traffic and noise levels approaching or exceeding the 67 dBA L_{eq} noise abatement criteria under Activity Category B and Activity Category C for the project:

- **NB-1:** An 832-foot-long barrier for construction year 2023 and design year 2043 was analyzed to shield Receptors 1 and 2 in Area A at 711 and 713 Industrial Park Drive.
- **NB-2:** A 4,043-foot-long barrier for construction year 2023 and a 4,218-foot-long barrier for design year 2043 were analyzed to shield Receptors 5 through 99 in Areas C, D, and E, at 801 Atherton Drive, 1005 Atherton Drive, and 120 Atherton Drive.
- **NB-3:** A 797-foot barrier was analyzed to shield Receptors 3 and 4 in Area B at 1252 and 1255 Van Ryn Avenue.
- **NB-4:** A 1,176-foot barrier for construction year 2023 and 1,051-foot barrier for design year 2043 were analyzed to shield Receptors 100 and 101 in Area F at 1505 Moffat Boulevard.
- **NB-5:** A 904-foot barrier was analyzed to shield Receptor 102 in Area G at 20179 Austin Road.
- **NB-6:** A 593-foot barrier for construction year 2023 and a 2,131-foot barrier for design year 2043 were analyzed to shield Receptors 103 and 104 in Area H at 20270 and 20405 99 Frontage Road. Under the design year 2043 conditions, these receptors would be acquired and therefore would not require noise barrier attenuation.
- **NB-7:** A 2,125-foot barrier was analyzed to shield Receptors 106, 107, and 108 in Area J at 20782 and 20900 99 Frontage Road.

Noise Barrier Feasibility

A minimum noise reduction of 5 dBA must be achieved at impacted receptors for the proposed noise abatement measures (noise barriers) to be considered feasible. In addition, barriers should be designed to intercept the line-of-sight from the exhaust stack of a truck to the first tier of receptors, as required by the Highway Design Manual, Chapter 1100. Other factors that affect feasibility include topography, access requirements for driveways and ramps, presence of local cross streets, utility conflicts, other noise sources in the area, and safety considerations. Greater noise reductions are encouraged if they can be reasonably achieved. Feasibility may be restricted by the following factors:

- Geometric standards
- Safety
- Maintenance contracts with private property
- Security
- Underground utilities
- Drainage
- Geotechnical considerations
- Cost

Noise Barrier Reasonableness

The overall reasonableness of noise abatement is determined by considering the noise reduction goal combined with the construction cost of the barrier. For a noise barrier to be considered reasonable, the noise level reduction design goal of 7 dbA must be achieved at one or more of the benefited receptors. For any noise barrier to be considered reasonable from a cost perspective, the estimated construction cost of the noise barrier would be equal to or less than the total cost allowance calculated for the barrier. The total reasonable allowance was determined based on the number of benefited receptors multiplied by the reasonable allowance per residence. The reasonable allowance per residence is based on a 2018 allowance of $95,000 per benefited unit/receptor. If the estimated noise barrier construction cost exceeds the total reasonable allowance, the noise barrier is determined to be not reasonable.

The key information for the noise abatement decision, including number of benefitted receptors, total reasonable allowance, and estimated construction cost of each barrier, is shown in **Table 2-22: Summary of Abatement Key Information.**

Table 2-22: Summary of Abatement Key Information

Noise Barrier No.	Area	Height (feet)	Approximate Length (feet)	Noise Attenuation (dBA)	Number of Benefitted Receptors	Acoustically Feasible?	Design Goal Achieved?	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance (Reasonable)?
Construction Year 2023										
NB-1	Area A	6	832	1	0	No	No	$0	N/A	N/A
		8	832	1	0	No	No	$0	N/A	N/A
		10	832	1	0	No	No	$0	N/A	N/A
		12	832	2	0	No	No	$0	N/A	N/A
		14	832	3	0	No	No	$0	N/A	N/A
		16	832	3	0	No	No	$0	N/A	N/A
NB-2	Areas C, D, E	6	4,043	5 - 6	105	Yes	No	$9,975,000	$1,836,700	Yes
		8	4,043	5 - 7	261	Yes	Yes	$24,795,000	$2,038,900	Yes
		10	4,043	6 - 7	405	Yes	Yes	$38,475,000	$2,373,100	Yes
		12	4,043	9 -11	528	Yes	Yes	$50,160,000	$2,831,900	Yes
		14	4,043	10 - 12	581	Yes	Yes	$55,195,000	$3,183,500	Yes
		16	4,043	10 - 13	587	Yes	Yes	$55,765,000	$3,763,500	Yes
NB-3	Area B	6	797	3	0	-	-	-	-	-
		8	797	7	1	Yes	Yes	$95,000	$403,600	No
		10	797	8	2	Yes	Yes	$190,000	$468,400	No
		12	797	9	2	Yes	Yes	$190,000	$565,000	No
		14	797	9	2	Yes	Yes	$190,000	$633,100	No
		16	797	10	2	Yes	Yes	$190,000	$760,700	No
NB-4	Area F	6	1,176	1	0	-	-	-	-	-
		8	1,176	1	0	-	-	-	-	-
		10	1,176	2	0	-	-	-	-	-
		12	1,176	2	0	-	-	-	-	-

Noise Barrier No.	Area	Height (feet)	Approximate Length (feet)	Noise Attenuation (dBA)	Number of Benefitted Receptors	Acoustically Feasible?	Design Goal Achieved?	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance (Reasonable)?
		14	1,176	2	0	-	-	-	-	-
		16	1,176	3	0	No	No	$0	N/A	N/A
NB-5	Area G	6	904	1	0	-	-	-	-	-
		8	904	1	0	-	-	-	-	-
		10	904	1	0	-	-	-	-	-
		12	904	2	0	-	-	-	-	-
		14	904	2	0	-	-	-	-	-
		16	904	2	0	No	No	$0	N/A	N/A
NB-6	Area H	6	593	3	0	-	-	-	-	-
		8	593	3	0	-	-	-	-	-
		10	593	6	1	Yes	No	$95,000	$346,400	No
		12	593	6	1	Yes	No	$95,000	$395,600	No
		14	593	7	1	Yes	Yes	$95,000	$450,700	No
		16	593	7	2	Yes	Yes	$190,000	$496,400	No
NB-7	Area J	6	2,125	4	1	Yes	No	$95,000	$947,800	No
		8	2,125	5	2	Yes	No	$190,000	$1,054,000	No
		10	2,125	6	2	Yes	No	$190,000	$1,241,000	No
		12	2,125	9	3	Yes	Yes	$285,000	$1,417,400	No
		14	2,125	9	3	Yes	Yes	$285,000	$1,615,000	No
		16	2,125	10	3	Yes	Yes	$285,000	$1,778,700	No
Design Year 2043										
NB-1	Area A	6	832	1	0	-	-	-	-	-
		8	832	2	0	-	-	-	-	-
		10	832	2	0	-	-	-	-	-
		12	832	3	0	-	-	-	-	-

Noise Barrier No.	Area	Height (feet)	Approximate Length (feet)	Noise Attenuation (dBA)	Number of Benefitted Receptors	Acoustically Feasible?	Design Goal Achieved?	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance (Reasonable)?
		14	832	3	0	-	-	-	-	-
		16	832	3	0	No	No	$0	N/A	N/A
NB-2	Areas C, D, E	6	4,218	4 - 6	76	Yes	No	$7,220,000	$1,914,800	Yes
		8	4,218	5 - 9	257	Yes	Yes	$24,415,000	$2,125,700	Yes
		10	4,218	6 - 10	374	Yes	Yes	$35,530,000	$2,475,300	Yes
		12	4,218	8 - 11	515	Yes	Yes	$48,925,000	$2,948,600	Yes
		14	4,218	9 - 12	545	Yes	Yes	$51,775,000	$3,316,500	Yes
		16	4,218	9 - 12	555	Yes	Yes	$52,725,000	$3,909,900	Yes
NB-3	Area B	6	797	3	0	-	-	-	-	-
		8	797	6	1	Yes	No	$95,000	$403,600	No
		10	797	7	2	Yes	Yes	$190,000	$468,400	No
		12	797	8	2	Yes	Yes	$190,000	$565,000	No
		14	797	8	2	Yes	Yes	$190,000	$633,100	No
		16	797	8	2	Yes	Yes	$190,000	$760,700	No
NB-4	Area F	6	1,051	1	0	-	-	-	-	-
		8	1,051	1	0	-	-	-	-	-
		10	1,051	1	0	-	-	-	-	-
		12	1,051	1	0	-	-	-	-	-
		14	1,051	2	0	-	-	-	-	-
		16	1,051	2	0	No	No	$0	N/A	N/A
NB-5	Area G	6	904	3	0	-	-	-	-	-
		8	904	3	0	-	-	-	-	-
		10	904	3	0	-	-	-	-	-
		12	904	4	0	-	-	-	-	-
		14	904	4	0	-	-	-	-	-

Noise Barrier No.	Area	Height (feet)	Approximate Length (feet)	Noise Attenuation (dBA)	Number of Benefitted Receptors	Acoustically Feasible?	Design Goal Achieved?	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance (Reasonable)?
		16	904	4	0	No	No	$0	N/A	N/A
NB-6	Area J	6	2,131	2	0	-	-	-	-	-
		8	2,131	2	0	-	-	-	-	-
		10	2,131	4	0	-	-	-	-	-
		12	2,131	6	3	Yes	No	$285,000	$1,421,400	No
		14	2,131	7	3	Yes	Yes	$285,000	$1,619,600	No
		16	2,131	7	3	Yes	Yes	$285,000	$1,783,700	No

Source: Noise Study Report, State Route 99/State Route 120 Interchange Project, September 2018, Tables 7-1 through 7-17, pgs. 49 to 59.
Notes: Bolded Noise Barrier No. indicates the barrier that is both reasonable and feasible.

Table 2-22 shows the key information for the noise abatement decision including feasibility/reasonability criterion.

Noise barriers NB-1 (in Area A), NB-4 (in Area F), and NB-5 (in Area G) would not be acoustically feasible during construction year 2023 and design year 2043 because the barrier does not provide a 5 dBA reduction or more for any impacted receptors. Therefore, these barriers are not recommended for further consideration.

Noise barrier NB-3 in Area B would be feasible at heights of 8 feet to 16 feet; however, only a 10-foot wall would meet the feasible criteria if implemented during construction year 2023 and design year 2043. The reasonable cost allowance ($190,000) to benefit the two receptors would be less than the estimated construction cost ($403,600) of the 10-foot tall noise barrier, so noise barrier NB-3 is not recommended for further consideration because it does not meet the reasonable criteria based on reasonable cost allowance of benefited receptors versus the barrier construction cost.

Noise barrier NB-6 (in Area H) would be feasible (during construction year 2023) at heights of 10 to 16 feet; at 14 feet, it would result in a line-of-sight break between receptors and an 11.5-foot-tall truck exhaust stack. The 14-foot wall would be the least expensive wall that would meet the feasible criteria; however, this wall height would only provide a 5 dBA or greater reduction to one receptor. The reasonable cost allowance ($95,000) would be less than the estimated construction for a 14-foot barrier ($450,000), so noise barrier NB-6 is not recommended for further consideration because it does not meet the reasonable criteria based on reasonable cost allowance of benefited receptors versus the barrier construction cost.

During design year 2043, noise barrier NB-6 (in Area J) would be acoustically feasible at heights of 12 feet to 16 feet; however, a 14-foot barrier would be the least expensive and still meet the feasible criteria. Since the 14-foot barrier would benefit three receptors with a reasonable allowance of $285,000 and an estimated construction cost of $1,619,000, noise barrier NB-6 is not recommended for further consideration because it does not meet the reasonable criteria based on reasonable cost allowance of benefited receptors versus the barrier construction cost.

During construction year 2023, noise barrier NB-7 (in Area J) would be acoustically feasible at all barrier heights, providing at least a 5 dBA or greater noise reduction. A 12-foot tall barrier would be the least expensive and still meet the feasible criteria. Since the 12-foot barrier would benefit three receptors with a reasonable allowance of $285,000 and an estimated construction cost of $1,417,400, noise barrier NB-7 (in Area J during construction year 2023) is not recommended for further consideration because it does not meet the reasonable criteria based on reasonable cost allowance of benefited receptors versus the barrier construction cost.

Noise barrier NB-2 was found to be feasible and would provide at least a 5 dBA or greater reduction for receptors in Areas C, D and E during construction year 2023 and design year 2043. The design goal of a 7 dBA reduction would be achieved starting at a barrier height of 8 feet for receptors in Area C and 12 feet for receptors in Areas D and E. However, the line-of-sight of an 11.5-foot-tall truck exhaust stack would not be blocked for all receptors in Area C with an 8-foot-tall barrier. A 12-foot-tall barrier would be the least expensive wall that would meet both the reasonable and feasible criteria for Areas C, D, and E.

In construction year 2023, a 12-foot barrier (in Areas C, D, and E) would benefit 528 receptors with a reasonable allowance of $50,160,000 and an estimated construction cost of $2,831,900, which is less than the reasonable cost allowance. In design year 2043, a 12-foot barrier (in Areas C, D, and E) would benefit 515 receptors with a reasonable allowance of $48,925,000 and an estimated construction cost of $2,948,600, which is less than the reasonable cost allowance. Therefore, noise barrier NB-2 is recommended at a height of 12 feet in Areas C, D, and E.

Avoidance, Minimization, and/or Noise Abatement Measures

Short-term Construction

The following measure would avoid and/or minimize short-term construction noise impacts:

NOI-1 The project will implement appropriate measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and/or installing acoustic barriers around construction noise sources if deemed excessive stationary noise levels by local noise ordinance standards.

Operation

Based on the studies completed to date, including the Noise Survey Report (2018), Caltrans intends to incorporate noise abatement in the form of a barrier in one location within the project site. Noise barrier NB-2 (12 feet tall) in Areas C, D, and E will be placed along the southern side of the eastbound lanes of State Route 120 within the Caltrans right-of-way, starting just east of the Main Street/State Route 120 eastbound on-ramp and ending just east of Moffat Boulevard. A 12-foot-tall barrier would be the least expensive wall that would meet both the reasonable and feasible criteria and would come closest to meeting the Caltrans barrier development guidelines.

Noise barrier NB-2 (12 feet tall) in Areas C, D, and E would benefit 528 receptors with a reasonable allowance of $50,160,000 and an estimated construction cost of $2,831,900, which is less than the reasonable cost allowance. Therefore, noise barrier NB-2 at a height of 12 feet is

recommended for Areas C, D, and E for construction year 2023 (Phase 1A) and design year 2043 (Phases 1A, 1B, and 1C).

If, during final design, conditions have substantially changed, noise abatement may not be necessary. The final decision on noise abatement will be made at completion of the project design and public involvement processes.

The following abatement measure would avoid and/or minimize operational noise impacts of the project:

NOI-2 Construction of noise barrier NB-2 (12 feet tall), as shown in **Figures 2-10** and **2-13**, in Areas C, D, and E will occur at the start of Phase 1A construction (construction year 2023). This barrier will be constructed at the start of Phase 1A construction so it will be functional during Phases 1B and 1C of the project to attenuate operational noise at sensitive receptors once the project is fully operational (design year 2043).

2.3 Biological Environment

2.3.1 Wetlands and Other Waters

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (33 U.S. Code 1344), is the main law regulating wetlands and surface waters. One purpose of the Clean Water Act is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high water mark, in the absence of adjacent wetlands. When adjacent wetlands are present, Clean Water Act jurisdiction extends beyond the ordinary high water mark to the limits of the adjacent wetlands. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes: the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404

permit program is run by the U.S. Army Corps of Engineers with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The U.S. Army Corps of Engineers issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of U.S. Army Corps of Engineers' Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the U.S. Army Corps of Engineers' decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (40 Code of Federal Regulations 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines were developed by the U.S. EPA in conjunction with the U.S. Army Corps of Engineers and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The guidelines state that the U.S. Army Corps of Engineers may not issue a permit if there is a "least environmentally damaging practicable alternative" to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (Executive Order 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, Executive Order 11990 states that a federal agency, such as Federal Highway Administration and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Alternative Finding must be made.

At the state level, wetlands and waters are regulated mainly by the State Water Resources Control Board, the Regional Water Quality Control Boards and the California Department of Fish and Wildlife. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify California Department of Fish and Wildlife before beginning construction. If California Department of Fish and Wildlife determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or

Streambed Alteration Agreement will be required. California Department of Fish and Wildlife jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the U.S. Army Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the California Department of Fish and Wildlife.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act. In compliance with Section 401 of the Clean Water Act, the Regional Water Quality Control Boards also issue water quality certifications for activities that may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. See the Water Quality section for more details.

Affected Environment

The *Natural Environment Study* (as listed in the List of Technical Studies at the end of this document), dated November 2018, contributed to the information and analysis in this section.

A biological study area was established to determine potential biological resource impacts associated with the project. The biological study area totals approximately 326.94 acres and includes portions of State Route 99 and State Route 120 and associated on- and off-ramps, Austin Road, East Woodward Avenue, and 99 Frontage Road. The biological study area also includes the project footprint, access and staging areas, and lands beyond the footprint to the edge of the road right-of-way that could potentially be affected by project construction and/or were determined necessary to inventory to perform an adequate analysis of the project impacts.

Aquatic resources within the biological study area are limited to roadside runoff ditches and agricultural or urban runoff detention basins. Aquatic features in the general vicinity of the biological study area include the Stanislaus River, about 2.5 miles to the south, and the San Joaquin River, about 4.5 miles to the west.

Aquatic resources within the biological study area consist of shallow basins and ephemeral ditches generally located in the central portion of the biological study area along the State Route 99 corridor and the State Route 120 and Austin Road interchanges, within the ruderal/disturbed habitat type. No wetlands were identified within any of these features.

Environmental Consequences

The non-wetland aquatic features within the project site do not appear to connect to any tributary waters of a significant nexus to interstate waters, and so are not regulated by the U.S. Army Corps of Engineers. Therefore, it is expected that the U.S. Army Corps of Engineers will concur that no jurisdictional waters of the U.S. are present in the project site and no permit pursuant to Section 404 of the Clean Water Act would be required. Also, these aquatic features do not fall under the definition of the California Department of Fish and Wildlife waters (i.e., California Department of Fish and Wildlife regulates wetland area only to the extent that those wetlands are part of a river, stream, or lake as defined by California Department of Fish and Wildlife). Therefore, a Lake or Streambed Alteration Agreement, pursuant to Sections 1600-1616 of the CFGC would not be required. Waters of the State, totaling 0.712 acre, include ephemeral ditches and shallow basins within the project site; however, there are no wetlands within the project site. The project would result in 0.20 acre of permanent impacts and 0.02 acre of temporary impacts to waters of the State. Construction BMPs will be implemented and in place prior to, during and after construction to ensure water runoff is contained onsite within Caltrans and City of Manteca right-of-way and impacts to the identified waters minimized.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are required for project effects involving wetlands and other waters of the United States.

2.3.2 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service), and the California Department of Fish and Wildlife are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed below. All other special-status animal species are discussed here, including California Department of Fish and Wildlife fully protected species and species of special concern, and U.S. Fish and Wildlife Service or NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- California Environmental Quality Act
- California Endangered Species Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code

Affected Environment

The *Natural Environment Study* (as listed in the List of Technical Studies at the end of this document), dated November 2018, contributed to the information and analysis in this section.

Common animal species (please refer to the **Appendix D: Species List**) observed or likely to occur within the biological study area include the following:

- Mammal species observed in the biological study area during field surveys include the California ground squirrel (*Otospermophilus beecheyi*), brown rat (*Rattus norvegicus*), and coyote (*Canis latrans*). In addition, dirt mounds most likely constructed by Botta's pocket gopher (*Thomomys bottae*) were observed in the biological study area. Common mammal species that may also occur in the biological study area include the Virginia opossum (*Didelphis virginiana*), black-tailed jackrabbit (*Lepus californicus*), and striped skunk (*Mephitis mephitis*).
- Birds observed in the biological study area during field surveys include the red-tailed hawk (*Buteo jamaicensis*), killdeer (*Charadrius vociferus*), Eurasian collared-dove (*Streptopelia decaocto*), yellow-billed magpie (*Pica nuttalli*), Brewer's blackbird (*Euphagus cyanocephalus*), and house sparrow (*Passer domesticus*). Common bird species that may also occur in the biological study area include the red-shouldered hawk (*Buteo lineatus*), ring-necked pheasant (*Phasianus colchicus*), western kingbird (*Tyrannus verticalis*), cliff swallow (*Petrochelidon pyrrhonata*), chipping sparrow (*Spizella passerina*), and great-tailed grackle (*Quiscalus mexicanus*).
- No amphibian or reptile species were observed during the field surveys. Common amphibian species likely to occur in the biological study area include the Pacific chorus frog (*Pseudacris sierra*) and western toad (*Anaxyrus boreas*). Common reptile species likely to occur in the biological study area include the gopher snake (*Pituophis catenifer*), common kingsnake (*Lampropeltis getulus*), and western fence lizard (*Sceloporus occidentalis*).

After evaluation, the special-status wildlife species with potential to occur in the biological study area include the pallid bat (*Antrozour pallidus*), Cooper's hawk (*Accipiter cooperii*), burrowing owl (*Athene cunicularia*), Aleutian cackling goose *(Branta hutchinsii leucopareia*), Swainson's hawk (*Buteo swainsoni*), white-tailed kite (*Elanus leucurus*), California horned lark *(Eremophila alpestris actia*), merlin (*Falco columbarius*) and, loggerhead shrike (*Lanius ludovicianus*).

Pallid Bat

The pallid bat (*Antrozous pallidus*) is a California Species of Special Concern and a locally common species at low elevations. The bat is a yearlong resident through most of its range. It uses a wide variety of habitats from sea level up through mixed conifer forests, but is most common in open dry habitats with rocky areas for roosting. This bat forages among trees and shrubs and over open ground, and often takes prey on the ground. Its diet consists of a variety of insects and spiders, including large hard-shelled prey, which are often carried to a perch or night roost for consumption. Caves, crevices, and sometimes hollow trees and buildings are used for day roosts. Roosts must protect bats from high temperatures. Night roosts may be in more open sites, such as porches and open buildings. Pallid bats are social, and most roost in groups of 20 or more. Maternity colonies form in early April and may have 10 to 100 individuals. Males may roost separately or in the nursery colony.

No pallid bats or sign of the presence of any bat species (e.g., urine staining, droppings, etc.) was observed anywhere in the biological study area during the biological survey. However, the weep holes on the underside of the Austin Road overcrossing provide potential day roost habitat for the pallid bat. While no sign of bat use was observed on any structures in the biological study area during the biological survey, the underside of the Austin Road overcrossing could not adequately be accessed to determine with certainty that bats were not present there. The row crops, orchards, and vineyards, as well as the ruderal areas in and adjacent to the biological study area, provide potential foraging habitat for the pallid bat.

Cooper's Hawk and White-Tailed Kite

The Cooper's hawk (*Accipiter cooperii*) is a State Watch List species protected under the CFGC. Cooper's hawks are a woodland dwelling hawk species that specializes in hunting small to medium birds that they pursue through the air. They are fairly common and range over much of the continent from southern Canada south through Mexico. In California, Cooper's hawks are yearlong residents throughout much of the state (except for the desert regions), and many other individuals arrive to spend the winter from more northern regions or migrate through the state to winter farther south.

A pair of Cooper's hawks was observed in a courtship flight over an almond orchard in the biological study area during the biological survey on November 21, 2017. One individual of the pair was also observed perched and occasionally vocalizing in an ornamental pine tree near the orchard property about 250 feet west of Austin Road and about 650 feet southwest of its intersection with Moffat Boulevard. An inactive nest that may have been used by these hawks in the recent past was observed in this same pine tree.

Roadside landscape and windbreak trees, orchards, as well as the edges of agricultural fields in and adjacent to the biological study area, provide potential foraging habitat for Cooper's hawks, and while the species typically prefers denser stands of trees than those that occur within the biological study area to nest in, the roadside landscape, windbreak and ornamental trees provide potential nesting habitat for the species within the biological study area.

The white-tailed kite (*Elanus leucurus*) is fully protected under the CFCG. This bird occurs from western Oregon south to northern Baja California. In California, white-tailed kites range throughout the Central Valley, west of the Sierra, and through the coast and coastal valleys from Humboldt County south. White-tailed kites nest and forage in a variety of settings. They build stick nests in the tops of trees, and eggs are laid from January to June. They forage for small rodents over grassland and open savanna.

No white-tailed kites were observed in the biological study area during the field surveys. The nearest California Natural Diversity Database record of a white-tailed kite (dated 2002) is from the Kennedy neighborhood of Stockton about 10.4 miles north of the biological study area. This record is of one adult nesting in a cottonwood tree.

There are numerous trees within and in the vicinity of the biological study area that are potential nesting trees for white-tailed kites. The row crops and ruderal/disturbed areas in the biological study area provide potential foraging habitat for the species. Since suitable foraging and nesting habitat is present, and the biological study area is within the known range of the species, this species has the potential to occur in the biological study area.

Burrowing Owl

The burrowing owl (*Athene cunicularia*) is a California Species of Special Concern with no federal status. Burrowing owls occur in warm valleys, open dry grasslands, deserts, and scrublands associated with agriculture and urban areas that support populations of California ground squirrels. Burrowing owls nest below ground, using abandoned burrows of other species (usually ground squirrel) and feed on insects and small mammals.

The burrowing owl is well documented near the biological study area. The California Natural Diversity Database shows 10 records for this species within

10 miles of the biological study area. The closest occurrence, dated 2000, is from about 2.5 miles northwest of the biological study area in a detention basin near the San Joaquin Rail Station parking lot. The row crops and ruderal habitats within the biological study area provide potential foraging and nesting habitat for burrowing owl. Burrows of suitable size were seen at various locations along the State Route 99 and State Route 120 embankments and in the largest expanses of ruderal habitat between the on-ramps of the State Route 99/State Route 120 interchange, but no sign of owl presence (whitewash, prey remains, etc.) was observed during the biological survey. However, this species could occur in the biological study area.

Aleutian Cackling Goose

The Aleutian cackling goose (*Branta hutchinsii leucopareia*) is a federally delisted species. This species nests in the Aleutian Islands off Alaska and winters along much of the West Coast and in the Central Valley where it forages in flooded, disced, cut, or irrigated fields. Cackling geese are highly mobile while foraging and can relocate to nearby foraging habitat if they are disturbed.

The California Natural Diversity Database contains two records of the Aleutian cackling goose within 10 miles of the biological study area, both about 6.5 miles south of the biological study area near the San Joaquin River National Wildlife Refuge.

The row crops in the biological study area provide potential foraging habitat for this species. Since potential foraging habitat is present, this species could occur in the biological study area during its nonbreeding (wintering) season (October through March).

Swainson's Hawk

The Swainson's hawk (*Buteo swainsoni*) is a State threatened species. It has no formal federal status. Most Swainson's hawks are long-distance migrants, leaving California by the end of October to winter in South America and returning north to nest by the end of March. Some individuals overwinter in the Sacramento-San Joaquin Delta region. In California, Swainson's hawks nest on the Modoc Plateau and the Great Basin, and throughout the Central Valley from about the Red Bluff area south to Kern County. Nests are built in the tops of large trees, often those associated with riparian habitats, or isolated trees in agricultural areas. They are known to forage up to 10 miles from their nest sites.

Swainson's hawks are well documented in the area; there are 99 records of Swainson's hawks within a 10-mile radius of the biological study area. The closest occurrence, dated 2011, is a nest about 1.1 miles north of the biological study area in a eucalyptus tree near State Route 99.

Numerous trees within and in the vicinity of the biological study area are potential nest trees for Swainson's hawks, and the row crops and ruderal/disturbed areas in the biological study area provide potential foraging habitat for the species. Since suitable foraging habitat is present and there are numerous records of Swainson's hawks nesting nearby, this species is highly likely to occur in the biological study area.

California Horned Lark and Loggerhead Shrike

The California horned lark (*Eremophila alpestris actia*) is a California Watch List species. This species is known from coastal regions and the Central Valley, inhabiting short-grass prairie, bald hills, mountain meadows, and fallow grain fields. These birds nest on the ground in grass-lined cup-shaped depressions in open grassy areas.

A flock of California horned larks was observed foraging in the fallow fields east of Austin Road and 99 Frontage Road during the biological survey on November 22, 2017.

The row and field crop lands and ruderal habitats in the biological study area provide suitable foraging and nesting habitat for this species. The California horned lark is known to be present within the biological study area.

The loggerhead shrike (*Lanius ludovicianus*) is a California Species of Special Concern; it has no federal status. Loggerhead shrikes are predatory songbirds that feed on insects, lizards, rodents, and smaller birds. They often impale their prey on barbwire fences or thorny vegetation, so they require habitats with at least one or the other. Nests tend to be built in dense trees or shrubs where the nests can be above ground and well hidden.

No loggerhead shrikes were seen during the field surveys. The California Natural Diversity Database contains a single record for the loggerhead shrike, dated 2016, within the 9-quad search area about 3.75 miles west of the biological study area in an empty parcel at the corner of Nestle Way and Christopher Way; a pair of adults was seen feeding four fledglings.

The row crops in the biological study area provide suitable foraging habitat for the loggerhead shrike, and the orchard and vineyard habitats as well as shrubs and trees in the ruderal/disturbed areas provide potential nesting habitat. This species was not seen during the field visits, but it could occur in the biological study area.

Merlin

The merlin (*Falco columbarius*) is a State Watch List species. This small falcon nests in spruce forests in Alaska, across most of Canada, and south into the northernmost United States, northern Rocky Mountains, and northern Great Plains. The merlin is an uncommon winter visitor to the rest of the United States, including California, where single individuals will forage by

ambushing small birds in low-level attack flights through open country such as grasslands, farmland, and ranchland. Open woodlands at the edges of grasslands or stands of trees in open areas (such as windbreaks) are often used for roosting.

A merlin was seen soaring over the open area between the westbound State Route 120 on-ramp and the industrial area to the north during the biological survey on November 22, 2017. It then flew west and northwest toward Spreckels Avenue.

The orchard, row crop, vineyard, and ruderal/disturbed habitats in the biological study area provide suitable winter foraging habitat for merlins, and the ornamental trees and windbreaks in various locations in the biological study area provide shelter for them to roost. This species is known to occur within the biological study area.

Environmental Consequences

Table 2-23: Impacts of Suitable Habitat for Special-Status Animals Species shows the impacts of the project on suitable habitat for species identified as candidate, sensitive or special status in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife.

Table 2-23: Impacts of Suitable Habitat for Special-Status Animal Species

Species	Permanent Impacts (acres)	Temporary Impacts (acres)	Total Impacts (acres)	Vegetation Community	Habitat Type
Pallid Bat	57.96	117.20	175.16	Row crops, orchard, vineyard, ruderal/disturbed	Foraging
Cooper's Hawk	45.39	103.35	148.74	Orchard, ruderal/disturbed	Nesting and foraging
White-Tailed Kite	42.60	86.78	129.38	Row crops, ruderal/disturbed	Foraging
Burrowing Owl	42.60	86.78	129.38	Row crops, ruderal/disturbed	Nesting and foraging
Aleutian Cackling Goose	7.75	9.92	17.67	Row crops	Wintering and foraging
Swainson's Hawk	42.60	86.78	129.38	Row crops, ruderal/disturbed	Foraging
California Horned Lark	42.60	86.78	129.38	Row crops, ruderal/disturbed	Nesting and foraging
Loggerhead Shrike	57.96	117.20	175.16	Row crops, orchard, vineyard, ruderal/disturbed	Potential habitat
Merlin	57.96	117.20	175.16	Row crops, orchard, vineyard, ruderal/disturbed	Foraging and roosting

Source: State Route 99/State Route 120 Interchange Connector, Natural Environment Study, prepared by LSA November 2018.

Temporary and permanent changes due to project implementation have the potential to result in take of the following special-status species: pallid bat, Cooper's hawk, white-tailed kite, burrowing owl, Aleutian cackling goose, Swainson's hawk, California horned lark, loggerhead shrike, and merlin.

Permanent impacts would occur as a result of project cut-and-fill activities; temporary impacts would occur as a result of project access and staging during construction activities. Considering the amount of habitat available for these species in the region relative to the amount of habitat in the biological study area and implementation of the measures detailed below, the project would not substantially contribute to cumulative effects on animal species.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measures outlined below would reduce impacts to the following special-status species: pallid bat, Cooper's hawk, white-tailed kite, burrowing owl, Swainson's hawk, California horned lark, and loggerhead shrike.

The risk of killing or harming the Aleutian cackling goose or merlin during project construction is very low because the Aleutian cackling goose is highly mobile while foraging and the merlin is highly mobile during the winter season and does not nest in California. Therefore, avoidance measures for these species are not included.

BIO-1 The following measures will be implemented by the project to reduce the potential for take of the pallid bat:

- Focused bat surveys will be conducted in the biological study area by a qualified bat biologist to determine if nursery or roost sites are present. Focused surveys will be the responsibility of the project. If pallid bats are roosting in the biological study area, the following measures will be implemented:
    - Prior to the nursery season for pallid bat (April through September) sites will be sealed or otherwise rendered unusable to bats (e.g., install grating).
    - Seal hibernation sites, prior to the hibernation season (November through March) when hibernation sites are identified in the biological study area. Alternatively, grating may be installed.
    - When colonial roosting sites in trees or structures must be removed, removal will occur outside of the nursery and/or hibernation seasons and will occur during dusk and/or evening hours after bats have left the roosting site.

BIO-2 The following measures will be implemented by the project to reduce the potential for take of the Cooper's hawk and white-tailed kite:

- If possible, all trees that will be impacted by the project construction will be removed during the non-nesting season (between September 1 and January 31), to avoid take of a nest or bird. If this is not possible, a survey for nesting Cooper's hawks and white-tailed kites will be conducted in the biological study area and within a 300-foot radius by a qualified biologist. The survey will be conducted to a maximum of 10 days prior to the start of construction. The survey area may be decreased due to property access constraints, etc.
- If nesting Cooper's hawks or white-tailed kites are found within 300 feet of the biological study area, a qualified biologist will evaluate the potential for the project to disturb

nesting activities. The evaluation criteria will include, but are not limited to, the location/orientation of the nest in the nest tree, the distance of the nest from the biological study area, and line of sight between the nest and the biological study area.

- The California Department of Fish and Wildlife will be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities.
- If work is allowed to proceed, a qualified biologist will be on-site weekly during construction activities that occur in breeding season to monitor nesting activity. The biologist will have the authority to stop work if it is determined the project is adversely affecting nesting activities.
- If the qualified biologist determines that the setback can be reduced, initial construction activities in the vicinity of the nest will be monitored by a qualified biologist. If the biologist determines nesting is not affected by construction activities with the reduced setback, work can proceed. If it is determined that construction activities are adversely affecting the nesting birds with the reduced setback, all construction within 300 feet of a nest will be halted until the biologist can establish an appropriate setback.
- Worker environmental awareness training will be conducted by a qualified biologist for all construction personnel. The training will instruct workers on the purpose of Environmentally Sensitive Area (ESA) fencing and the resources being protected.

BIO-3 The following measures will be implemented by the project to reduce the potential for impacts to the burrowing owl:

- Preconstruction surveys for the burrowing owl will be conducted by a qualified biologist in accordance with California Department of Fish and Wildlife's 2012 Staff Report on Burrowing Owl Mitigation.
- If burrowing owls are identified during the preconstruction survey, passive exclusion will be implemented per California Department of Fish and Wildlife's 2012 Staff Report on Burrowing Owl Mitigation (including avoidance of occupied burrows during the breeding season from February 1 to August 31).
- Following construction, all fill slopes, temporary impacts and/or otherwise disturbed areas will be restored to

preconstruction contours (if necessary) and revegetated with the native seed mix specified in **Table 2-24: Native Species Mix**. Invasive exotic plants will be controlled pursuant to the following:

- All earthmoving equipment to be used during project construction will be cleaned thoroughly before arrival on the project site.
- All seeding equipment (i.e., hydroseed trucks) will be thoroughly rinsed at least three times prior to beginning seeding work.
- To avoid spreading any non-native invasive species already existing on-site to off-site areas, all equipment will be thoroughly cleaned before leaving the site.
- To avoid introduction of additional non-native species to the site, all fill dirt brought onto the site must be weed-free.

Table 2-24: Native Species Mix

Scientific Name	Common Name	Rate (pounds per acre)	Minimum Percentage Germination
Artemisia douglasiana	Mugwort	2.0	50
Bromus carinatuscarinatus	California brome	5.0	85
Elymus trachycaulus	Slender wheatgrass	2.0	60
Elymus X triticum	Regreen	10.0	80
Eschsolzia californica	California poppy	2.0	70
Hordeum brachyantherum	California barley	2.0	80
Lupinus bicolor	Bicolored lupine	4.0	80

BIO-4 The following measures will be implemented by the project to reduce the potential take of the Swainson's hawk:

- If work begins between February 1 and August 31, an early season preconstruction survey for nesting Swainson's hawks will be conducted between January and March in the biological study area and immediate vicinity (an approximately 0.25-mile radius) by a qualified biologist when tree foliage is relatively sparse and nests are easy to identify. A second preconstruction survey for nesting Swainson's hawks will be conducted in the biological study area and immediate vicinity (an approximately 0.25-mile

radius) by a qualified biologist no more than 10 days prior to initiation of earthmoving activities.

- If nesting Swainson's hawks are found within the survey area, a qualified biologist will evaluate the potential for the project to disturb nesting activities. The California Department of Fish and Wildlife will be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities. The California Department of Fish and Wildlife will also be consulted to establish protection measures such as buffers. Disturbance of active nests will be avoided until it is determined by a qualified biologist that nesting is complete and the young have fledged, or that the nest has failed. If work is allowed to proceed, at a minimum, a qualified biologist will be on-site during the start of construction activities during the nesting season to monitor nesting activity. The monitor will have the authority to stop work if it is determined the project is adversely affecting nesting activities.
- Worker environmental awareness training will be conducted by a qualified biologist for all construction personnel. This training instructs workers to recognize Swainson's hawks and their habitat(s).
- Brightly colored Environmentally Sensitive Area (ESA) fencing will be placed along the limits of work to prevent unnecessary encroachment into adjacent areas. Fencing will be maintained in good condition for the duration of construction activities.
- Following construction, all fill slopes, temporary impact and/or otherwise disturbed areas will be restored to preconstruction contours (if necessary) and revegetated with the native seed mix specified above in **Table 2-24**. Invasive exotic plants will be controlled pursuant to the measures presented in Section 5.7 of the Draft Natural Environment Study.

BIO-5 The following measures will be implemented by the project to reduce the potential for take of the California horned lark and loggerhead shrike:

- If construction begins during the nesting season (February 1 to August 31), a survey for nesting California horned larks and loggerhead shrikes will be conducted in the biological study area and within a 100-foot radius by a qualified biologist. The survey will be conducted a maximum of 10 days prior to the start of construction.

- If nesting California horned larks or loggerhead shrikes are found within 100 feet of the project footprint during the survey, an initial setback of 100 feet from nesting areas will be established and protected with Environmentally Sensitive Area (ESA) fencing. Environmentally Sensitive Area fencing will be maintained during the nesting season until construction is complete or the young have fledged, as determined by a qualified biologist.
- A qualified biologist will evaluate the potential for the proposed work to disturb nesting activities considering the 100-foot setback. The evaluation criteria will include, but are not limited to, the location/orientation of the nest, the distance of the nest to the work limits, the line of sight between the nest and the work limits, and the description of the proposed work.
- If work is allowed to proceed, a qualified biologist will be on-site weekly during construction activities that occur in breeding season to monitor nesting activity. The biologist will have the authority to stop work if it is determined the project is adversely affecting nesting activities.
- If the qualified biologist determines that the setback can be reduced, initial construction activities in the vicinity of the nest will be monitored by a qualified biologist. If the biologist determines nesting is not affected by construction activities with the reduced setback, work can proceed. If it is determined that construction activities are adversely affecting the nesting birds with the reduced setback, all construction within 100 feet of a nest will be halted until the biologist can establish an appropriate setback.
- Worker environmental awareness training will be conducted by a qualified biologist for all construction personnel. The training will instruct workers about the purpose of Environmentally Sensitive Area fencing and the resources being protected.

2.3.3 Invasive Species

Regulatory Setting

On February 3, 1999, President William J. Clinton signed Executive Order 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as “any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm

or harm to human health." Federal Highway Administration guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of the National Environmental Policy Act (NEPA) analysis for a project.

Affected Environment

The *Natural Environment Study* (as listed in the List of Technical Studies at the end of this document), dated November 2018, contributed to the information and analysis in this section.

Many non-native plant species have been part of the California landscape for the past 150 years and are considered naturalized in the wild. Some examples of these introduced plant species observed during surveys include common oats (*Avena sativa*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), Italian thistle (*Carduus pycnocephalus*), and foxtail barley (*Hordeum murinum*), among others. These species are mostly annual or biennial and considered to be moderately invasive at worst.

Environmental Consequences

Two species of concern were observed in the biological study area during surveys: yellow star thistle (*Centaurea solstitalis*) and broadleaved pepperweed (*Lepidium latifolium*). These species have an invasive rating of "high" according to the California Invasive Plant Council Invasive Plant Inventory Online Database (http://www.cal-ipc.org/paf/).

Avoidance, Minimization, and/or Mitigation Measures

Implementation of the avoidance and minimization measure outlined below would reduce impacts related to invasive species.

BIO-6 To avoid the introduction of invasive species into the biological study area during project construction, contract specifications will include, at a minimum, the following measures:

- All earthmoving equipment to be used during project construction will be cleaned thoroughly before arrival on the project site.
- All seeding equipment (i.e., hydroseed trucks) will be thoroughly rinsed at least three times prior to beginning seeding work.
- To avoid spreading any non-native invasive species already existing on-site to off-site areas, all equipment will be thoroughly cleaned before leaving the site.
- To avoid introduction of additional non-native species to the site, all fill dirt brought onto the site must be weed-free.

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Chapter 3 CEQA Evaluation

3.1 Determining Significance under CEQA

The project is a joint project by Caltrans and the Federal Highway Administration and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both the National Environmental Policy Act (NEPA) and the California Environmental Quality Act (CEQA). The Federal Highway Administration's responsibility for environmental review, consultation, and any other actions required by applicable federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 U.S. Code Section 327 (23 USC 327) and the Memorandum of Understanding dated December 23, 2016 and executed by the Federal Highway Administration and Caltrans. Caltrans is the lead agency under NEPA and CEQA.

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

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

3.2 CEQA Environmental Checklist

This checklist identifies physical, biological, social, and economic factors that might be affected by the project. In many cases, background studies performed in connection with the project will indicate that there are no impacts to a particular resource. A “no impact” answer in the last column reflects this determination. The words “significant” and “significance” used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as best management practices and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 to provide you with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This checklist incorporates by reference the information contained in Chapters 1 and 2.

AESTHETICS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☒	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

CEQA Significance Determinations for Aesthetics

a) No Impact

The project area does not contain any designated scenic vistas. The area is topographically flat and consists of urban and agricultural areas, with distant views of the coastal range and Sierra Nevada Mountains. Design features associated with the project would not impact scenic vistas because none exist in the project area. **No impacts** would occur during Phase 1A, Phase 1B or Phase 1C of the project. CEQA-related mitigation measures would not be required.

b) No Impact

The City of Manteca does not identify or designate scenic routes within its jurisdiction. San Joaquin County designates Interstate 5 from the Sacramento County line south to Stockton as a designated scenic route; however, the City of Manteca is south of Stockton, and Interstate 5 is not visible from the project site. The project would not substantially damage scenic resources, trees, rock outcroppings, and historic buildings within a state scenic highway because no scenic highways exist within the project area. **No impacts** would occur during Phase 1A, Phase 1B or Phase 1C of the project. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact

The project would result in minor changes to visual resources as measured by changes in visual character and visual quality. The project would be slightly larger in scale than the roadway's existing conditions; however, overall visual character and visual quality would remain the same or improve

slightly compared to existing conditions. Minimization measure **AES-1** (described in Chapter 2) would further avoid or minimize construction impacts. Phase 1A, Phase 1B or Phase 1C of the project would not substantially degrade the visual quality and character of the site and its surroundings; a **less than significant impact** would occur. CEQA-related mitigation measures would not be required.

d) No Impact

Exterior lighting and illuminated signage exist in the vicinity of the project area, and headlights from vehicles traveling on State Route 99, State Route 120 and nearby roads also serve as near-constant sources of light and glare. The project would not include new lighting elements in an area in which there is currently no lighting. Minimization measure **AES-2** (described in Chapter 2) would help avoid or minimize any introduced light and glare during construction of Phases 1A, 1B and 1C. **No impact** would occur. CEQA-related mitigation measures would not be required.

AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☒	☐
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☒	☐

CEQA Significance Determinations for Agriculture and Forest Resources

a) Less Than Significant Impact

Impacts to farmlands are discussed in detail in Section 2.1.2 Farmland. Implementation of the project would result in approximately 48.95 acres of right-of-way conversions, including both agriculture and urban lands. The proposed right-of-way conversions would result in the loss of 0.93 acre of Prime Farmland and 35.97 acres of Farmland of Statewide Importance. The

project would result in a total loss of 36.9 acres of Important Farmland, as defined by CEQA.

As of 2016, San Joaquin County had a total Important Farmland inventory of 615,075 acres. Of the 615,075 acres, 381,634 acres were designated as Prime Farmland; 82,618 acres were designated as Farmland of Statewide Importance; 81,920 acres were designated as Unique Farmland; and, 68,903 acres were designated as Farmland of Local Importance. As of 2017, the City of Manteca had a total Important Farmland inventory of 4,944.365 acres, which consisted of 1,095.536 acres of Prime Farmland; 3,278.122 acres of Farmland of Statewide Importance; and, 570.707 acres of Farmland of Local Importance. The project would result in a 0.08 percent decrease of the Manteca Prime Farmland inventory and a 0.000244 percent decrease of the County Prime Farmland inventory. The project would result in a 1.09 percent decrease of the Manteca Farmland of Statewide Importance inventory and a 0.043 percent decrease of the County Farmland of Statewide Importance inventory.

It should be noted, the areas that would be converted due to project implementation have already been designated as urban uses in the Manteca and County General Plans, so conversion of such land to urbanized uses is already planned for the area.

The project would result in a comparatively low proportion of Important Farmland conversion; the proposed conversion areas are not designated for future agricultural use, and the project would not be required to consider further protection under the Farmland Protection Policy Act. Based on this, impacts to Important Farmland, as defined by CEQA (Prime Farmland and Farmland of Statewide Importance), would be **less than significant** with implementation of the project. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

Two parcels under Williamson Act contract sit within the boundary of the project:

- **APN 228-060-180-000:** This parcel is approximately 33.85 acres. The project would acquire 8.46 acres of that total.
- **APN 228-060-210-000:** This parcel is approximately 73.41 acres. The project would acquire 0.37 acre of that total. This parcel commenced with the non-renewal process in 2012 and will be out of the Williamson Act contact in 2021.

The project would relieve congestion and improve roadway operations for local commuters and improve access for local businesses, so the project could be considered a public improvement. As public entities, Caltrans and

the San Joaquin Council of Governments would be able to acquire portions of the parcels under Williamson Act contract without cancelling the contracts. Instead, the contracts for the portions acquired would be nullified, while the remaining land in the parcels would continue to be under the existing Williamson Act contract. To publicly acquire the portions of the parcels under Williamson Act contracts, the project would follow the notification procedures required by the California Department of Conservation Division of Land Resource Protection. To ensure this is done properly, avoidance and minimization measure **AG-3** (described in Chapter 2) would be applied to the project.

The portions of the project within the City of Manteca are not zoned as agricultural land. Portions of the project that are in unincorporated San Joaquin County areas are zoned as Agricultural Urban Reserve and General Agriculture. **Table 3-1: Agriculturally Zoned Parcels to be Acquired** shows the parcels that are agriculturally zoned and the amount of acreage of each parcel that would be acquired for the project.

Table 3-1: Agriculturally Zoned Parcels to be Acquired

Assessor Parcel Number	Zoning Designation	Total Parcel Acreage	Acreage to be Acquired	Percentage of Parcel to be Acquired
228-020-39	AU-20	23.15	1.19	5.1
228-050-02	AU-20	23.13	0.44	1.9
228-050-18	AU-20	47.86	4.65	9.7
228-050-19	AU-20	0.46	0.46	100.0
228-060-08	AG-40	35.64	5.66	15.9
228-060-15	AG-40	1.26	1.26	100.0
228-060-18	AG-40	33.85	8.46	24.9
228-060-19	AG-40	8.28	0.80	9.7
228-060-20	AG-40	8.68	0.26	2.9
228-060-21	AG-40	73.41	0.37	0.5
Total		255.72	23.55	0.09

Source: Draft Community Impact Assessment Checklist, February 2018.
Notes: AU-20 = Agriculture-Urban Reserve Zone; AG-40 = General Agricultural Zone

The project is considered a public improvement. It would result in a minimal conversion of agricultural land (less than 0.1 percent). Project proponents would work with local jurisdictions to request zoning amendments for the agriculturally zoned partial parcel acreages that will be rezoned to right-of-way and will acquire portions of the parcels under Williamson Act contract. Therefore, the project would result in a **less than significant impact**. CEQA-related mitigation measures would not be required.

c) No Impact

The project would not conflict with the zoning for or cause rezoning of forestland and timberland. No forest land or timberland is located within the project vicinity. **No impact** would occur. CEQA-related mitigation measures would not be required.

d) No Impact

The project site sits in an urbanized setting. No forestland resources occur within or adjacent to the project site; parcels within and adjacent to the project site are not zoned forestland, so **no impact** would occur. CEQA-related mitigation measures would not be required.

e) Less Than Significant Impact

Implementation of the project has the potential to indirectly affect portions of parcels that are currently under agricultural production. During construction, the project has the potential to damage crops outside of the project boundary due to dust generation or access requirements (i.e., accessing the project site from parcels that are currently under agricultural production). Construction and operation of the project may also require detours or road closures that could limit access to surrounding parcels under agricultural production. Finally, construction of the project has the potential to disrupt water flow to nearby parcels under agricultural production because irrigation ditches and pipelines may temporarily need to be shut off/blocked and/or removed or relocated. All of these potential situations could result in indirect effects to nearby agricultural land causing farmland to be converted to urban uses if not properly avoided or mitigated.

Avoidance and minimization measures **AG-1** and **AG-2** discussed in Chapter 2 would be implemented to avoid potential agricultural conversion and damage to existing nearby agricultural operations. Impacts would be **less than significant**.

AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

CEQA Significance Determinations for Air Quality

a) No Impact

The project would not obstruct implementation of or conflict with any applicable air quality plans. The project would have **no impacts** during Phases 1A, 1B, 1C and operation. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

The project is included in the San Joaquin Council of Governments Year 2018 Regional Transportation Plan. The associated Air Quality Conformity Analysis verifies that the Regional Transportation Plan and the 2019 Transportation Improvement Plan conform with the latest EPA transportation conformity regulations and the conformity State Implementation Plan. Therefore, there is no potential for the project to interfere with air quality plans that are designed to reduce cumulative air quality impacts in the project area. Impacts would be **less than significant** during Phases 1A, 1B, 1C and project operation. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact

Implementation of the project during Phases 1A, 1B and 1C could generate construction-related emissions, resulting in the short-term degradation of air quality. This would be caused by the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction activities. The project proponent will implement minimization and avoidance measures **AQ-1**, **AQ-2,** and **AQ-3** (described in Chapter 2) to ensure that such emissions would not exceed existing emissions standards. Implementation of these minimization and avoidance measures would reduce impacts to **less than significant** during Phases 1A, 1B and 1C. CEQA-related mitigation measures would not be required.

d) Less Than Significant

The project is anticipated to generate lesser emissions of VOC, NO_x and mobile source air toxics in 2023 and 2043 compared to the No-Build Alternative and existing conditions. (Sellers comment: Spell out yellow items.) Emissions decrease in 2023 and 2043 compared to the existing conditions mostly due to fleet turnover and improvements in exhaust controls. When compared to the No-Build Alternative, the project would result in slight reductions in daily criteria pollutant emissions due to improved traffic flow, except for particulate matter and CO in 2043. Marginal increases in daily emissions of these pollutants are attributed to increases in vehicle miles traveled associated with the interchange reconfiguration and expanded capacity. These nominal increases would not result in the exceedance of standards for these specific emissions.

The project would result in marginal reductions in particulate matter emissions in 2023 and marginal increases in particulate matter emissions in 2043 when compared to the No-Build Alternative. The increases are associated mostly with increased vehicle miles traveled and brake and tire wear. The marginal increases would not conflict with or obstruct timely attainment of the particulate matter standards. During 2023 and 2043 with project conditions, NO_x emissions will decrease when compared to existing conditions mostly due to fleet turnover and improvements in exhaust controls. When compared to the No-Build Alternative, the project would result in slight reductions in daily criteria pollutant emissions due to improved traffic flow. The project has not been linked with any special mobile source air toxics concerns and has been determined (through modeling) to generate minimal air quality impacts for criteria pollutants. The project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in mobile source air toxics impacts. Therefore, impacts from air quality emissions generated during operation of the project would be **less than significant.** CEQA-related mitigation measures would not be required.

e) Less Than Significant

During construction activities, operation of construction equipment may generate exhaust that could expose nearby sensitive receptors to objectionable odors. Such odors would be temporary and would dissipate quickly. Operation of the project is not anticipated to generate odors above and beyond those that are already generated by existing traffic. Impacts would be **less than significant** during construction Phases 1A, 1B, 1C and project operation. CEQA-related mitigation measures would not be required.

BIOLOGICAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☒	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

CEQA Significance Determinations for Biological Resources

a) Less Than Significant Impact

As discussed in Section 2.3.2 Animal Species, a Natural Environment Study was done for the project. The following analysis is taken from the results of the study.

The project could affect the following special-status species: pallid bat, Cooper's hawk, white-tailed kite, burrowing owl, Aleutian cackling goose,

Swainson's hawk, California horned lark, loggerhead shrike, and merlin. Permanent and temporary impacts would occur as a result of project cut-and-fill activities and project access and staging during construction activities.

The Cooper's hawk, California horned lark, and merlin were observed within the biological study area during field surveys. In addition, the following were identified within the biological study area: potential roosting habitat for the pallid bat; foraging and nesting habitat for the white-tailed kite, burrowing owl, Swainson's hawk and loggerhead shrike; and potential foraging habitat for the Aleutian cackling goose.

The risk of killing or harming the Aleutian cackling goose or merlin during project construction is very low because the Aleutian cackling goose is highly mobile while foraging and the merlin is highly mobile during the winter season and does not nest in California. In addition, considering the amount of habitat available in the region relative to the amount of habitat in the biological study area, and implementation of the avoidance and minimization measures **BIO-1** through **BIO-5** (described in Chapter 2), the project would result in a **less than significant impact**. CEQA-related mitigation measures would not be required.

b) No Impact

The project is not in an area with riparian habitat or sensitive natural communities, so the project would have **no impact** on riparian habitats or sensitive natural communities. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact

The non-wetland aquatic features within the project site do not appear to connect to any tributary waters of a significant nexus to interstate waters and, as such, are not regulated by the U.S. Army Corps of Engineers. Therefore, it is expected that the U.S. Army Corps of Engineers will concur that no jurisdictional waters of the U.S. are present in the project site and no permit pursuant to Section 404 of the Clean Water Act would be required. Furthermore, these aquatic features do not fall under the definition of California Department of Fish and Wildlife waters (the California Department of Fish and Wildlife regulates wetland areas only to the extent that those wetlands are part of a river, stream, or lake as defined by California Department of Fish and Wildlife). Therefore, a Lake or Streambed Alteration Agreement, pursuant to Sections 1600-1616 of the CFGC would not be required.

Waters of the State, totaling 0.712 acre, include ephemeral ditches and shallow basins within the project site, but no wetlands occur within the project site. The project would result in 0.20 acre of permanent impacts and 0.02 acre of temporary impacts to waters of the State. Therefore, the project would be subject to Waste Discharge Requirements from the Regional Water

Quality Control Board under the Porter-Cologne Act. The project would comply with all applicable Regional Water Quality Control Board requirements through implementation of standard measures **WQ-1** through **WQ-4 Less than significant impacts** would occur to non-wetland aquatic features or wetlands during project construction of Phases 1A, 1B, and 1C or during operation. CEQA-related mitigation measures would not be required.

d) No Impact

During field surveys within the project site, no substantial evidence was found indicating that any portion of the project area is used as a wildlife migration corridor. The project site is composed of multiple roads, a patchwork of agricultural parcels, industrial areas, and residential developments that are all impediments to wildlife movement. **No impacts** would occur to wildlife migration during project construction of Phases 1A, 1B, and 1C or during operation. CEQA-related mitigation measures would not be required.

e) No Impact

The project would be consistent with local policies or ordinances protecting biological resources. Minor tree removal would be required as part of the project. Trees within the existing right-of-way at the State Route 99/State Route 120 interchange and the Austin Road interchange, and orchard trees as part of the realigned Woodward Avenue connection to Austin Road, would be removed. Tree ordinances set forth by the City of Manteca and San Joaquin County will be followed by the project. Therefore, **no impact** would occur during project construction of Phases 1A, 1B, and 1C or during operation. CEQA-related mitigation measures would not be required.

f) No Impact

The project sits within the jurisdiction of the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan. The plan was evaluated, and it was determined that the plan would not expedite or reduce the costs of the project; therefore, the plan was not used. The project would not conflict with any adopted Habitat Conservation Plan or other approved local, regional, or state habitat conservation plan. Therefore, **no impact** would occur during project construction of Phases 1A, 1B, and 1C or during operation. CEQA-related mitigation measures would not be required.

CULTURAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☒	☐

CEQA Significance Determinations for Cultural Resources

a) No Impact

Nineteen parcels containing built environment cultural resources over 45 years old were identified adjacent to or within the project footprint. Based on the design of the project, it was determined that 11 of the 19 built environment cultural resources would not be adversely affected by the project because they were set back far enough from the footprint, and/or they were screened by vegetation or other development.

Two of the remaining eight parcels in the area of potential effect did not require evaluation because they met the Section 106 exemption criteria as Property Type 3: Buildings so altered as to appear less than 30 years old, or Property Type 1: Minor, ubiquitous, or fragmentary infrastructure elements (mobile homes).

The remaining six parcels contained built environment cultural resources over 45 years old that were evaluated for listing in the National Register of Historic Places and California Register of Historical Resources to determine if implementation of the project would affect these resources. The analysis concluded that of the six built environment resources evaluated, none appear eligible for listing in the National Register of Historic Places or the California Register of Historical Resources under any qualifying criteria. Therefore, the project would not impact built environment cultural resources during construction of Phases 1A, 1B, and 1C and project operation. **No impact** would occur. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

During field surveys, staff identified one piece of white improved earthenware, fragments of large mammal cancellous bone, and a refuse scatter of modern glass and ceramic dishes, all of which were found within the area of potential effect. The area of potential effect contains soils classified as moderate to high in sensitivity for encountering buried precontact archaeological deposits; however, this potential has been affected by decades of ranching and farming activities. The potential still exists that previously unknown buried historical and archaeological deposits could be discovered during grading and excavation work associated with construction activities. If such cultural resources are discovered, avoidance measures identified below would be implemented to ensure the sensitive cultural resources are not adversely affected by project implementation. With implementation of avoidance and minimization measure **CULT-1** and standardized measure **CULT-3** (described in Chapter 2), impacts to archaeological and cultural resources would be **less than significant** during construction of Phases 1A, 1B, and 1C. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact

No special paleontological situations that would require project design to avoid critical fossil localities or deposits are anticipated for the project. The project would include some degree of ground disturbance in paleontologically sensitive sediments and therefore has the potential to inadvertently unearth scientifically significant, nonrenewable paleontological resources. If such resources are discovered, ground-disturbing activities would be halted and the resources would be evaluated by a qualified paleontologist. Therefore, impacts to paleontological resources would be **less than significant** during construction of Phases 1A, 1B, and 1C. CEQA-related mitigation measures would not be required.

d) Less Than Significant Impact

No human remains, including those of Native American descent, are known to exist within the area of potential effect. If during construction of the project, undocumented human remains are uncovered, standardized measure **CULT-3** (described in Chapter 2) would ensure that potential impacts are reduced to **less than significant** during construction of Phases 1A, 1B, and 1C. CEQA-related mitigation measures would not be required.

GEOLOGY AND SOILS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

CEQA Significance Determinations for Geology and Soils

a) No Impact

The project would not expose people or structures to potential adverse effects including the risk of loss, injury, or death involving seismically induced events such as earthquakes, liquefaction, seismically induced settlement, or seismically induced slope failure. **No impact** would occur. CEQA-related mitigation measures would not be required.

i) No Impact

The project area is not within a designated Alquist-Priolo Earthquake Fault Zone. There would be **no impact**. CEQA-related mitigation measures would not be required.

ii) No Impact

Because of the distance from the project site to active faults, it is estimated that light ground shaking (based on a calculated Peak Ground Acceleration of 0.37 gravity (g)) would occur at the site during a seismic event and there is a very low probability of surface rupture at the project site. Implementation of the project would result in **no impact**. CEQA-related mitigation measures would not be required.

iii) Less Than Significant Impact

Because of the soil conditions and level of groundwater at the project site, liquefaction potential exists at the site and post-liquefaction settlement of the ground up to 7 inches could occur. Implementation of standard measure **GEO-1** would obtain site-specific data appropriate to design the project to reduce impacts to potential liquefaction events. Implementation of the project would result in a **less than significant impact**. CEQA-related mitigation measures would not be required.

iv) No Impact

No steep slopes exist within the project site, so seismically induced landslide potential does not exist within the project site. The new human-made slopes would be designed to meet the Caltrans Seismic Design Criteria and, therefore, would reduce the risk of slope failure during a seismic event. Implementation of the project would result in **no impact**. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

Construction activities occurring on-site have the potential to cause severe soil erosion or loss of topsoil; however, best management practices in compliance with Caltrans standards for soil erosion control would be incorporated into construction activities to reduce erosion. A **less than significant impact** would occur. CEQA-related mitigation measures would not be required.

c) No Impact

The project site is in a topographically flat area and is not near any steep slopes that would present the risk of landslides. The potential of liquefaction exists due to soil conditions and level of groundwater; however, such risks would be reduced through the implementation of standard measure **GEO-1**. There are no expansive soils that would present the risk of lateral spreading within the project vicinity. Implementation of the project would result in **no impact**. CEQA-related mitigation measures would not be required.

d) No Impact

Expansive soil (shrink-swell capacity) was not encountered near the surface of the project; however, it should be verified prior to the start of construction that expansive soils are not located in subsurface areas of the project site. If expansive soil is encountered in subsurface areas, standardized measures and best management practices would be implemented. **No impact** would occur. CEQA-related mitigation measures would not be required.

e) No Impact

The project would not require septic tanks or alternative waste water disposal systems. Implementation of the project would result in **no impact**. CEQA-related mitigation measures would not be required.

GREENHOUSE GAS EMISSIONS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

CEQA Significance Determinations for Greenhouse Gas Emissions

a) Less than Significant Impact

While the proposed Project will result in GHG emissions during construction, it is anticipated the Project will not result in any increase in operational GHG emissions. In fact, the proposed Project will lower emissions at Design Year when compared to the existing setting. Because there is a reduction in future emissions with the Project compared to existing emissions, there is still evidence of substantial progress in reducing emissions even with the minimal increase over future no-build emissions; therefore, impacts to GHG emissions would be **less than significant**. With the implementation of GHG-reduction measures AQ 1-3, GHG 1-3, and TRA-1 these impacts would be further reduced. CEQA-related mitigation measures would not be required.

b) No Impact

The proposed Project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gasses. **No impact** would occur. CEQA-related mitigation measures would not be required.

HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within 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 result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

CEQA Significance Determinations for Hazards and Hazardous Materials

a) Less Than Significant

The historical uses of the project site and existing structures indicate the potential presence of site contamination by aerially deposited lead, asbestos-containing materials, and lead-based paint. Most of the project site was occupied by agricultural uses in the past, so on-site soils likely contain some

amount of pesticides, herbicides, and arsenic. The project site has also been historically occupied (since the early 20th century) by railroad tracks. Soils surrounding railroad tracks are often impacted with elevated levels of metals, petroleum hydrocarbons, and polyaromatic hydrocarbons. Please refer to the analysis provided in Section 2.2.1 Hazardous Waste and Materials.

As excavation during construction could reveal unknown hazardous materials or contamination (asbestos-containing materials, lead-based paint, pesticides, herbicides, and arsenic) of soils, implementation of avoidance and minimization measures **HAZ-1** through **HAZ-4** (described in Chapter 2) would be necessary, to reduce impacts to **less than significant**. CEQA-related mitigation measures would not be required.

b) Less Than Significant

As discussed under threshold *a* above, hazardous materials may exist within the project site. However, implementation of avoidance and minimization measures **HAZ-1** through **HAZ-4** (described in Chapter 2) would reduce any potential impacts to **less than significant**. CEQA-related mitigation measures would not be required.

c) No Impact

There are no existing or proposed schools within a quarter mile of the project site, so **no impact** would occur. CEQA-related mitigation measures would not be required.

d) Less Than Significant

Federal and state agency regulatory lists were reviewed to identify the presence of hazardous waste sites in the vicinity of the project pursuant to Government Code Section 65962.5. Most of the hazardous waste sites that were identified were either closed, down- or cross-gradient, or too far up-gradient to pose an impact to the project site or construction workers on the project site. Several Leaking Underground Storage Tanks sites were identified but they were all closed sites and were too far up or cross gradient to pose a potential impact to the Project. As no hazardous sites were identified on or near the Project site, a significant hazard to the public or the environment would not occur; as such, **no impact** would occur under CEQA. CEQA-related mitigation measures would not be required.

e) No Impact

There are no private or public use airports within 2,000 feet of the project, so the project would not result in hazards associated with such transportation uses and **no impact** would occur. CEQA-related mitigation measures would not be required.

f) No Impact

There are no private airstrips within the project vicinity. **No impact** would occur. CEQA-related mitigation measures would not be required.

g) No Impact

The City of Manteca's and San Joaquin County's emergency response plans are designed to be compatible with projected buildout, including the improved interchange at State Route 99/State Route 120. With implementation of standard measure **TRA-1** and the avoidance and minimization measures **TRA-2** and **TRA-3** (described in Chapter 2) listed below under Traffic and Transportation in Section 3.2 CEQA Environmental Checklist, the project would have **no impact** to Manteca's and San Joaquin County's emergency response plans. CEQA-related mitigation measures would not be required.

h) No Impact

Review of CalFire's Fire Hazard Severity Zones Maps for the project area indicates that the project is not located in a wildland fire area. **No impact** would occur. CEQA-related mitigation measures would not be required.

HYDROLOGY AND WATER QUALITY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

CEQA Significance Determinations for Hydrology and Water Quality

a) Less Than Significant Impact

During construction of the project, equipment would be used, increasing the chance that accidental spills or releases of fuels, oils, or other potentially toxic materials could occur within the site boundary. There are no wetlands or waterways on the project site or within close proximity of the project site; however, accidental spills have the potential to contaminate on-site soils, which could leach into groundwater. The project would also disturb more than 1 acre of soil during construction. With implementation of standard measures **WQ-1** through **WQ-4** (described below), impacts to water quality standards and waste discharge requirements would be **less than significant** during project Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

WQ-1 Preparation and implementation of construction site temporary best management practices by the project will comply with the provisions of the Caltrans Statewide National Pollutant Discharge Elimination System Permit and any subsequent permit as they relate to construction activities for the project. These best management practices will include submission of a Notice of Intention to the Central Valley Regional Water Quality Control Board at least 30 days before the start of construction and submission of a Notice of Termination to the Regional Water Quality Control Board upon completion of construction and stabilization of the project site. The temporary best management practices will be installed by the project prior to any construction operations and will be in place for the duration of the contract. The removal of these best management practices by the project will be the final operation, along with the project site cleanup.

WQ-2 The project will follow Design Pollution Prevention and Treatment Control best management practices for the project in accordance with the procedures outlines in the Stormwater Quality Handbooks, Project Planning and Design Guide. Compliance with Design Pollution Prevention and Treatment Control best management practices will included coordination with the Regional Water Quality Control Board with respect to feasibility, maintenance, and monitoring of Treatment Control best management practices as set forth in Caltrans' Statewide Stormwater Management Plan. A Water Pollution Control Program will need to be prepared by a Qualified Stormwater Pollution Prevention Plan Practitioner.

WQ-3 The project will be required to comply with the provisions specified in Section 13 “Water Pollution Control,” and Section 14-11 “Hazardous Waste and Contamination,” of the California State Standard Specifications, regarding spill prevention and control measures. All workers will be informed by the project of the importance of preventing spills and appropriate measures to take should a spill occur.

WQ-4 To control sedimentation during and after project implementation, the project will implement best management practices outlined in any authorizations or permits, issued under the authorities of the Clean Water Act that it receives for the project. If best management practices are ineffective, the project will remedy the situation immediately, in consultation with the regulatory and resource agencies.

b) No Impact

The Preliminary Geotechnical Report for the project indicated that there was groundwater encountered at a depth ranging between 1.5 feet and 22.5 feet below the existing ground level. The project would not rely on pumping groundwater. There would be **no impact** to groundwater as a result of implementation of the project Phases 1A, 1B, and 1C or during project operation. CEQA-related mitigation measures would not be required.

c) No Impact

The project site drainage is generally by sheet flow or collected by local drainage systems. During construction, temporary drainage facilities may be required to redirect runoff from work areas. While there may be minimal impacts to existing hydrology, there would be no alteration to its course or a substantial permanent increase in runoff. Existing drainage systems at the edge of shoulders or in the median may need to be relocated. There would be **no impact** to drainage patterns causing erosion or siltation either off-site or in the project site during Phases 1A, 1B, and 1C or during project operation. CEQA-related mitigation measures would not be required.

d) No Impact

There would be **no impact** to drainage patterns causing flooding or increased runoff either off-site or in the project site during Phases 1A, 1B, and 1C or during project operation. CEQA-related mitigation measures would not be required.

e) No Impact

The project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff. **No impact** would occur. CEQA-related mitigation measures would not be required.

f) Less Than Significant Impact

The Stormwater Pollution Prevention Plan would include measures to avoid and reduce potential impacts to water quality during project construction by incorporating applicable temporary construction site-specific best management practices. Therefore, with the inclusion of standard measures **WQ-1** through **WQ-4** (described above), any potential impacts to water quality would be **less than significant** during **p**roject Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

g) No Impact

Flood Insurance Rate Maps show that the project site is within unshaded Zone X, which indicates areas determined to be outside the 0.2 percent (500-year) annual chance floodplain. The scope of work proposed does not include adding housing or structures of any type. **No impact** would occur. CEQA-related mitigation measures would not be required.

h) No Impact

The project is not within the 100-year flood hazard area and would not include the construction of any structures that would impede or redirect flows within a 100-year flood hazard area. **No impact** would occur. CEQA-related mitigation measures would not be required.

i) No Impact

There are no levees or dams in the project area. There would be **no impact** during project Phases 1A, 1B, and 1C and project operation. CEQA-related mitigation measures would not be required.

j) No Impact

No water bodies that would present a risk for seiche or tsunamis are within the project vicinity. There are no steep slopes that exist within or near the project site. Also, the project site is relatively topographically flat with elevations ranging between 40 and 78 feet above mean sea level. Landslide potential does not exist at the project site. No distinct evidence of recent or past landslides was observed during field geological investigations or previously mapped by others within the project study area. Any new human-made slopes associated with the project would be designed to meet the Caltrans Seismic Design Criteria and, therefore, would reduce the risk of slope failure during a seismic event. **No impact** related to inundation by seiche, tsunami, or mudflow would occur. CEQA-related mitigation measures would not be required.

LAND USE AND PLANNING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

CEQA Significance Determinations for Land Use and Planning

a) No Impact

The project would not divide an established community because the transportation facility already exists. There would be **no impact** during project Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

b) No Impact

The City of Manteca, San Joaquin County, and the San Joaquin Council of Governments have incorporated the development of the project into their land use plans/planning documents, indicating that an improved State Route 99/State Route 120 connector is needed to alleviate existing and future traffic congestion due to an increase in anticipated/planned development trends, and also needed to improve vehicle circulation safety. Implementation of the project is not anticipated to increase planned development trends in the City of Manteca or unincorporated portions of San Joaquin County in the project site vicinity. There would be **no impact** to land use or planning during project Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

c) No Impact

The project would not conflict with any adopted Habitat Conservation Plan or other approved local, regional, or state habitat conservation plan. The project is within the jurisdiction of the San Joaquin Multi-Species Conservation Plan. However, the plan would not expedite or reduce costs of the project and

would not be used. The project would not conflict with the adopted San Joaquin Multi-Species Conservation Plan as this plan will not be used for project implementation. Therefore, **no impact** would occur during project construction of Phases 1A, 1B, and 1C or during operation. CEQA-related mitigation measures would not be required.

MINERAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

CEQA Significance Determinations for Mineral Resources

a) No Impact

Construction activities occurring during Phase 1A, Phase 1B, and Phase 1C of the project would not result in the loss of mineral resources. **No impact** would occur during project Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

b) No Impact

Mineral Resource Zones are adjacent to the project site; however, no Mineral Resource Zones are in the permanent impact areas of the project, so mineral resources would not be lost and **no impact** would occur during project Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

NOISE

Would the project result in:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within 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?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

CEQA Significance Determinations for Noise

a) Less Than Significant Impact

Construction Impacts

Noise levels during project construction have the potential to impact nearby sensitive noise receptors throughout the study area. Most of the noise sensitive receptors potentially impacted by construction noise are south of State Route 120 and west of State Route 99, or near the frontage road. Typical construction noise levels may reach 94.3 dBA L_{max} at a distance of 50 feet from the noise sources. Due to the proximity of these receptors to both State Route 99 and State Route 120, construction noise is anticipated to be overshadowed by traffic noise. Construction activities would be temporary and would mostly occur during normal daytime hours. The City of Manteca's noise ordinance allows construction activities during the hours of 7:00 a.m. to 7:00 p.m. If construction activities occur outside of these hours, coordination with the City, including potential measures to reduce noise levels, would be required. The County's Municipal Code (Title IX, Chapter 97, Section

97.04(B)(1)) restricts noise from construction activities within 500 feet of residential units between the hours of 10:00 p.m. to 6:00 a.m. daily; on Sundays, hours are extended to 8:00 a.m. Some construction activities may require limited work during nighttime hours. A variance or waiver would be required from the City prior to the start of construction activities during nighttime hours. Impact pile driving would occur only during daytime hours, which would reduce the potential for impacts at sensitive receptors. In addition, minimization measure **NOI-1** (described in Chapter 2) would minimize construction noise impacts under the project. Impacts from construction noise are anticipated to be **less than significant** under CEQA. CEQA-related mitigation measures would not be required.

Long-Term Transportation Noise Impacts

Most of the existing sensitive receptors in the City of Manteca and unincorporated San Joaquin County are currently and would continue to be (during construction year 2023 and design year 2043 conditions) exposed to traffic noise approaching or exceeding City/County General Plan noise standards. The existing noise levels at the residential sensitive receptors that were studied in the Noise Study Report (see Table B-1 in the Noise Study Report as listed in the List of Technical Studies at the end of this document) ranged between 61 to 75 dBA L_{eq}(h), all of which currently exceed City and County standards. Under the construction year 2023 scenario, the existing sensitive receptors may be exposed to a noise level increase of 2 dBA L_{eq}(h), which does not constitute a substantial noise increase (a substantial noise increase under CEQA is considered to be greater than a 5-dBA L_{eq}(h) increase). Under the design year 2043 scenario, noise level increases at sensitive receptors are anticipated to be as much as 5 dBA L_{eq}(h) with implementation of the project. This noise level increase does not constitute a substantial noise increase under CEQA. Also, the sensitive receptors studied in the Noise Study Report are currently exposed to noise levels that exceed the City and County noise level thresholds for sensitive receptors. Impacts under CEQA would be **less than significant.** CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

The nearest sensitive receptors are about 50 feet from construction areas of the project. Construction equipment such as bulldozers would generate the highest vibration levels of 0.089 peak particle velocity inches/second at a distance of 25 feet. At 50 feet, the sensitive receptors could be exposed to groundborne vibration levels as high as 0.031 peak particle velocity inches/second, which is considered barely perceptible to humans and would not result in community annoyance. This vibration level would be well below the damage threshold of 0.3 peak particle velocity inches/second for residential structures and would not have the potential to damage nearby residential structures. In addition, compliance with local noise ordinances and the Caltrans Standard Specifications would minimize vibration impacts.

Therefore, groundborne vibration and noise impacts would be **less than significant** under CEQA. CEQA-related mitigation measures would not be required.

Groundborne vibration from vehicles driving on the project facilities would not result in any measurable changes in vibration levels compared to the existing conditions. Therefore, vibration impacts are considered **less than significant** under CEQA during project operation. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact with Mitigation Incorporated

As discussed under threshold *a* above, implementation of the project would result in a permanent increase in ambient noise levels. However, the increase is not anticipated to exceed 5dBA L_{eq}(h), and therefore is not considered substantial under CEQA. In addition, sensitive receptors within the project vicinity are currently experiencing noise levels that exceed the City and County noise level thresholds, under existing conditions. Although not required to reduce noise impacts to sensitive receptors under CEQA, implementation of mitigation measure **NOI-2** would further reduce noise levels generated by the project at nearby sensitive receptors. Implementation of the project (which includes mitigation measure **NOI-2** incorporation) would result in a **less than significant impact**. Additional, CEQA-related mitigation measures would not be required.

d) Less Than Significant Impact

As discussed under threshold *a* above, construction noise levels may reach 94.3 dBA L_{max} at a distance of 50 feet from the source. However, due to the proximity of sensitive noise receptors to State Route 99 and State Route 120, construction noise would be overshadowed by traffic noise. In addition, the project would comply with City and County noise standards, and construction activities would be temporary and primarily occurring during normal daytime hours. Minimization measure **NOI-1** (described in Chapter 2) would be implemented to further reduce noise impacts. A **less than significant impact** would occur. CEQA-related mitigation measures would not be required.

e) No Impact

Stockton Metropolitan Airport is about 6 miles north of the project site and is the closest public use airport. The project is not within the Airport Influence Area of the Stockton Metropolitan Airport Land Use Compatibility Plan and is far enough away that implementation of the project would not expose people residing or working in the project area to excessive noise levels from the airport. Therefore, **no impact** would occur during project Phases 1A, 1B, and 1C and during project operation. CEQA-related mitigation measures would not be required.

f) No Impact

The project is not in the vicinity of a private airstrip based on review of aerial maps. Implementation of the project would therefore not expose people residing or working in the area to excessive noise from private airstrips. **No impact** would occur during Phases 1A, 1B, 1C and project operation. CEQA-related mitigation measures would not be required.

POPULATION AND HOUSING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐

CEQA Significance Determinations for Population and Housing

a) No Impact

The project would not introduce new homes or businesses to the area. The project would indirectly affect growth within the City of Manteca and unincorporated San Joaquin County areas by improving the circulation in the area of the State Route 99/State Route 120 connector and alleviating adverse effects to circulation associated with future planned growth within the City of Manteca. The project and the relevant cumulative projects would not stimulate unplanned residential or related commercial growth. The area growth is created in response to planned land use and forecast traffic demand and is included in the City of Manteca General Plan and the San Joaquin County General Plan and their Environmental Impact Reports. The project would have **no impacts** during Phases 1A, 1B, 1C and operation. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

The project would require the partial and full acquisition of parcels that are occupied by six residential units to implement Phase 1C of the project. Tenants of those residential units would be displaced and require relocation. The existing stock of housing in the City of Manteca that is for sale would be sufficient to accommodate relocation of the residents of these six residential units, so the need for construction of replacement housing would not be required. Impacts would be **less than significant** during Phases 1A, 1B, 1C and project operation. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact

As discussed above under threshold *b*, Phase 1C of the project would result in the displacement of the tenants of six residential units. However, sufficient housing is available in the City of Manteca to accommodate relocation of the residents and the project would not necessitate the construction of replacement housing elsewhere. A **less than significant impact** would occur. CEQA-related mitigation measures would not be required.

PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☒	☐
Parks?	☐	☐	☒	☐
Other public facilities?	☐	☐	☒	☐

CEQA Significance Determinations for Public Services

a) Less Than Significant Impact

Temporary lane, road, and intersection closures are expected during construction. Such closures would result in delays, but the closures are not expected to disrupt emergency services since the construction contractor would circulate construction schedules and traffic control information to City of Manteca and San Joaquin County emergency-service providers. This would allow emergency service providers to plan for the use of alternate routes during project construction-related road closures. Once implemented, the project would improve the ability of emergency services to better serve the community. The project would reduce congestion in the connector area, which could reduce response times for fire, medical, and police services. There are no schools or parks or other public facilities in the project area. Standardized measure **TRA-1** (described in Chapter 2) would be implemented to ensure that emergency services have access to the project area during construction activities.

Avoidance and minimization measure **TRA-2** (described in Chapter 2) would be implemented to ensure that emergency services are provided adequate advance notice of detours to ensure response times to the project area are not impacted.

With implementation of standardized measure **TRA-1** as well as avoidance and minimization measure **TRA-2**, there would be a **less than significant**

impact during project construction Phases 1A, 1B, 1C and project operation. CEQA-related mitigation measures would not be required.

RECREATION

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

CEQA Significance Determinations for Recreation

a) No Impact

The project would reconstruct an existing transportation facility. Nearby parks exist, but the project would not increase the use of existing neighborhood/ regional parks or other recreational facilities due to the type of project it is. **No impact** to recreation would occur during construction Phases 1A, 1B, and 1C and project operation. CEQA-related mitigation measures would not be required.

b) No Impact

The project does not include the development of a recreational facility as part of its design and therefore would not include such facilities that could have an adverse physical effect on the environment. **No impact** to recreation would occur during construction Phases 1A, 1B, and 1C and project operation. CEQA-related mitigation measures would not be required.

TRANSPORTATION/TRAFFIC

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

CEQA Significance Determinations for Transportation/Traffic

a) Less Than Significant Impact

General construction activities associated with implementation of Phases 1A, 1B and 1C of the project would cause lane, ramp, and intersection closures, leading to temporarily increased congestion. Access to parcels occupied by residential units, businesses, or industrial uses in the area could be limited depending on construction activities. Also, response times for emergency responders (i.e., law enforcement, fire protection, and ambulance services) could potentially be impacted during general construction activities because of detours. Implementation of standard measure **TRA-1** and avoidance and minimization measures **TRA-2,** and **TRA-3** (described in Chapter 2) would

reduce such impacts during the general construction activities of the project. With such measures, impacts during construction would be **less than significant**. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

Operation of the project was analyzed under four different scenarios due to the timing of Phases 1A, 1B, and 1C of the project. Phase 1A is anticipated to be constructed in 2023; traffic conditions (intersection and roadway segments) were analyzed for construction year 2023 and design year 2043 for Phase 1A. Phases 1B and 1C would be implemented as funding becomes available. Phase 1B is anticipated to be completed by 2033. Traffic conditions were analyzed for an interim year 2033 for Phase 1B and design year 2043 plus ultimate project (the ultimate project being Phases 1A, 1B and 1C combined and built out).

The existing State Route 99/State Route 120 connector interchange will not provide enough capacity to serve traffic by 2023; the project (Phase 1A) is needed to improve the level of service conditions in construction year 2023. Implementation of the project (Phase 1A) in construction year 2023 would provide benefits to the regional circulation by improving level of service on State Route 120, State Route 99, most of the Caltrans right-of-way intersections, and most local intersections. Some local intersections (eastbound State Route 120 off-ramp/Main Street intersection; Moffat Boulevard/Woodward Avenue intersection; northbound State Route 99 Ramps/Yosemite Avenue intersection; Moffat Boulevard connector/Austin Road, and Woodward Avenue/Main Street intersections) during morning and evening peak hours would still operate at unacceptable level of service conditions. Implementation of avoidance and minimization measures **TRA-4** through **TRA-7** (described in Chapter 2) would improve level of service conditions to acceptable levels in construction year 2023 with Phase 1A, and impacts would be **less than significant**.

The existing State Route 99/State Route 120 connector interchange will not provide enough capacity to serve traffic volumes by 2043. Based on the modeling conducted in the design year 2043 with Phase 1A, it was determined that the improvements associated with the project (Phase 1A) would not provide benefits nor improve level of service conditions to State Route 120, State Route 99, the Caltrans right-of-way intersections, and local jurisdictional intersections. Under design year 2043 with Phase 1A morning peak hour conditions, the northbound State Route 99 to westbound State Route 120 freeway-to-freeway ramp is projected to continue to operate at unacceptable level of service conditions. This impact would be alleviated by implementation of avoidance and minimization measure **TRA-8** (described in Chapter 2). Also, to improve the level of service conditions for studied segments and intersections in the design year 2043, it is recommended that Phase 1B of the project be implemented by interim year 2033 conditions. As discussed in detail in Section 2.1.5 Traffic and Transportation/Pedestrian and

Bicycle Facilities, the interim year 2033 analysis indicates that with Phase 1B improvements level of service would improve. However, enforcement of timely Phase 1B construction through implementation of mitigation measures cannot be guaranteed due to funding availability.

Finally, the circulation conditions were modeled for design year 2043 with the ultimate project (Phases 1A, 1B, and 1C implemented). This scenario would provide benefits to State Route 120, State Route 99, most of the Caltrans right-of-way intersections, and local jurisdictional intersections. The State Route 120/Main Street intersections will continue to operate at unacceptable level of service conditions with implementation of the project under the design year 2043 with ultimate project scenario. Implementation of avoidance and minimization measure **TRA-9** (described in Chapter 2) would reduce impacts. With implementation of minimization measure **TRA-9**, this intersection would operate at acceptable level of service conditions during the evening peak hours under the design year 2043 with ultimate project scenario. Overall, implementation of the project (Phases 1A, 1B, and 1C), along with the planned San Joaquin Council of Governments/City of Manteca improvements at the State Route 120/Main Street interchange, would construct sufficient capacity to adequately serve projected design year 2043 morning and evening peak hour demand volumes. Impacts would be **less than significant,** and CEQA-related mitigation measures would not be required.

c) No Impact

The project would not result in any changes to air traffic patterns, **and no impact** will occur. CEQA-related mitigation measures would not be required.

d) No Impact

The project design would not involve any hazardous features. Implementation of the project would improve hazardous features that already exist on the mainline segments of State Route 99 and State Route 120. **No Impact** would occur due to project implementation. CEQA-related mitigation measures would not be required.

e) Less Than Significant

Response times for emergency responders (i.e., law enforcement, fire protection, and ambulance services) could potentially be impacted during general construction activities. Implementation of standard measure **TRA-1** and avoidance and minimization measures **TRA-2,** and **TRA-3** (described in Chapter 2) would reduce such impacts during the general construction activities of the project. With the measures, impacts during construction would be **less than significant**. CEQA-related mitigation measures would not be required.

f) No Impact

The project would not improve or degrade existing transit or non-transit facilities along State Route 99, State Route 120, or intersections within the project footprint. Implementation of the project would therefore have no effect on bicycle or transit facilities in the City of Manteca or unincorporated areas of San Joaquin County. The project would have a **no impact**. CEQA-related mitigation measures would not be required.

TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

CEQA Significance Determinations for Tribal Cultural Resources

a) No Impact

If any tribal cultural materials are discovered during project excavation and construction, the implementation of avoidance and minimization measure **CULT-1** and **standard** measures **CULT-2** and **CULT-3** (described in Chapter 2) would prevent any potential impacts to tribal cultural resources. There would be **no impacts** during construction Phases 1A, 1B, 1C and project operation. CEQA-related mitigation measures would not be required.

b) No Impact

As stated above under item *a,* no resources have been identified within the project area. If an unidentified resource is discovered during project construction, the implementation of avoidance and minimization measure **CULT-**1 and standard measures **CULT-2** and **CULT-3** (described in Chapter 2) would prevent any impacts to tribal cultural resources. The project would result in **no impacts** to tribal cultural resources. CEQA-related mitigation measures would not be required.

UTILITIES AND SERVICE SYSTEMS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

CEQA Significance Determinations for Utilities and Service Systems

a) No Impact

Wastewater collection occurs in the City of Manteca via a municipal wastewater collection system that includes 242 miles of sewer mains and 19 pump stations. The collection system includes gravity flow pipes ranging from 6-inch to 60-inch diameter and force mains from 6-inch to 24-inch diameter. Municipal wastewater is treated at the City's Wastewater Quality Control Facility, which treats an average dry weather flow of about 6 million gallons per day, has an average dry weather design capacity of 9.87 million gallons per day, and has a buildout capacity of 27 million gallons per day. Per contractual agreement, 8.42 million gallons per day of plant capacity is allocated to the City of Manteca.

The project would not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board, and **no impact** would occur. CEQA-related mitigation measures would not be required.

b) No Impact

During construction of Phases 1A, 1B, and 1C, water would be required for dust control and minimal wastewater would be generated. The amount of water required and wastewater anticipated to be generated during construction would be minimal and would occur on a temporary basis for the duration of construction activities. Any amount of wastewater generated by construction workers would be hauled and treated off-site.

Water and sewer lines, maintained and owned by the City of Manteca, run within the project site and would need to be relocated. Water and sewer lines are in Moffat and East Woodward; their locations would be verified, and they would be avoided to reduce impacts due to project implementation. Water and sewer lines that run parallel to and cross State Route 99 in the vicinity of Austin Road would be relocated to avoid impacts from the project.

Implementation of the project would not require construction of new or expansion of existing water or wastewater facilities; as such, **no impact** would occur under CEQA. CEQA-related mitigation measures would not be required.

c) Less Than Significant Impact

The project would result in an increase in impervious surfaces at the State Route 99/State Route 120 interchange connector; however, design features of the project include stormwater drainage facility installation (i.e., drainage ditches and vegetated bioswales) to accommodate any increases in stormwater runoff. Best management practices and standard measures **WQ-2** through **WQ-4** (described in Chapter 2) would be implemented to reduce impacts. A **less than significant impact** would occur. CEQA-related mitigation measures would not be required.

d) Less Than Significant Impact

There would be no long-term utility consequences as a result of the project. The South San Joaquin Irrigation District currently has irrigation lines within the project boundary that parallel and cross State Route 99 and are north of the State Route 99/State Route 120 connector. These utilities would likely need to be relocated or encased so they would not be impacted by the project. As stated above, the project would require water for dust control during construction. However, such use would be temporary and in minimal quantity. The project would not require new or expanded entitlements and a **less than significant impact** would occur. CEQA-related mitigation measures would not be required.

e) No Impact

The amount of wastewater anticipated to be generated during construction would be minimal, would occur on a temporary basis for the duration of construction activities, and would be hauled and treated off-site. The wastewater treatment provider would have adequate capacity to serve the project. **No impact** would occur. CEQA-related mitigation measures would not be required.

f) No Impact

The Forward Sanitary Landfill provides waste disposal service to the City of Manteca. This landfill is the only Class II facility in San Joaquin County designed to accept both designated wastes such as contaminated soil as well as inert municipal solid waste. Accepted wastes include green materials, sludge (biosolids), asbestos, tires, industrial, and mixed municipal. The project would not exceed the capacity of the Forward Sanitary Landfill. There would be **no impacts**, and CEQA-related mitigation measures would not be required.

g) No Impact

The project would comply with all regulations regarding solid waste. **No impact** would occur. CEQA-related mitigation measures would not be required.

MANDATORY FINDINGS OF SIGNIFICANCE

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☒	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

CEQA Significance Determinations for Mandatory Findings of Significance

a) Less Than Significant Impact

The project would have the potential to adversely impact special-status animals, habitat, and previously undiscovered cultural resources and/or human remains. With implementation of the avoidance and minimization measures recommended in this document, compliance with City of Manteca and San Joaquin County requirements, and application of standard practices, the project would not: 1) degrade the quality of the environment; 2) substantially reduce the habitat of plant or wildlife species; 3) cause a wildlife population to drop below self-sustaining levels; 4) threaten to eliminate a plant or animal community; 5) reduce the number or restrict the range of a rare or endangered plant or animals; or, 6) eliminate important examples of the major periods of California history or prehistory. Impacts would be **less than significant** during Phases 1A, 1B, and 1C and operation of the project. CEQA-related mitigation measures would not be required.

b) Less Than Significant Impact

As discussed in Section 3.2, all environmental impacts that could occur as a result of the project would be reduced to a less than significant level with inclusion of the standard measures recommended throughout this document in the project design. When viewed in conjunction with other closely related past, present, or reasonably foreseeable future projects, development of this project would not cumulatively contribute to impacts. Impacts would be **less than significant** during Phases 1A, 1B, and 1C and operation of the project. CEQA-related mitigation measures would not be required.

c) Less Than Significant with Mitigation Incorporated

The project will not generate environmental impacts that will directly or indirectly cause substantial adverse effects on human beings. Where potential impacts occur, standard project measures, avoidance and minimization measures, and mitigation measures have been implemented to ensure direct and indirect impacts to human beings do not occur. There will be relocations of humans due to project implementation; however, it has been determined that enough housing inventory exists around the project to accommodate the affected population. Noise generated by operation of the project has the potential to impact nearby sensitive receptors; however, mitigation measure **NOI-2** will be implemented (implementation of a noise barrier in Phase 1A) to reduce noise levels at affected sensitive receptors. Impacts would be **less than significant with Mitigation Incorporated** under CEQA.

3.3 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gas (also known as GHG) emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 led to increased efforts devoted to greenhouse gas emissions reduction and climate change research and policy. These efforts are concerned mostly with the emissions of greenhouse gases generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (1, 1, 1, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of greenhouse gas emissions is electricity generation, followed by transportation.[3] In the U.S., the main source of greenhouse gas emissions is electricity generation, followed by transportation. In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest contributors of greenhouse gas emissions.[4] The dominant greenhouse gas emitted is CO_2, mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: "greenhouse gas mitigation" and "adaptation." "Greenhouse gas mitigation" covers the activities and policies aimed at reducing greenhouse gas emissions to reduce or "mitigate" the impacts of climate change. "Adaptation," on the other hand, is concerned with planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).

Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce greenhouse gas emissions from transportation sources.

[3] https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014
[4] https://www.arb.ca.gov/cc/inventory/data/data.htm

Federal

To date, no national standards have been established for nationwide mobile-source greenhouse gas reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and greenhouse gas emissions reduction at the project level.

NEPA (42 U.S. Code Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The Federal Highway Administration recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. The Federal Highway Administration therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.[5] This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic, and social values—"the triple bottom line of sustainability."[6] Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making.

Various efforts have been made at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

The Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The main goal of the program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy

[5] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[6] https://www.sustainablehighways.dot.gov/overview.aspx

efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 U.S. Code Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance, 74 Federal Register 52117 (October 8, 2009): This federal order set sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. It instituted as policy of the United States that federal agencies measure, report, and reduce their greenhouse gas emissions from direct and indirect activities.

Executive Order 13693, Planning for Federal Sustainability in the Next Decade, 80 Federal Register 15869 (March 2015): This order reaffirms the policy of the United States that federal agencies measure, report, and reduce their greenhouse gas emissions from direct and indirect activities. It sets sustainability goals for all agencies to promote energy conservation, efficiency, and management by reducing energy consumption and greenhouse gas emissions. It builds on the adaptation and resiliency goals in previous executive orders to ensure agency operations and facilities prepare for impacts of climate change. This order revokes Executive Order 13514.

The U.S. EPA's authority to regulate greenhouse gas emissions stems from the U.S. Supreme Court decision in Massachusetts v. EPA (2007). The Supreme Court ruled that greenhouse gases meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the court's ruling, the U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence, it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

The U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of greenhouse gas emission standards for new cars and light-duty vehicles in April 2010[7] and

[7] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq

significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 miles per gallon by 2025. Because the National Highway Traffic Safety Administration cannot set standards beyond model year 2021 due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which the National Highway Traffic Safety Administration, EPA, and Air Resources Board will decide on the CAFE and greenhouse gas emissions standard stringency for model years 2022–2025. The National Highway Traffic Safety Administration has not formally adopted standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 miles per gallon by 2025 was appropriate. In March 2017, President Donald Trump ordered the EPA to reopen the review and reconsider the mileage target.[8]

The National Highway Traffic Safety Administration and EPA issued a Final Rule for "Phase 2" for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

Presidential Executive Order 13783, Promoting Energy Independence and Economic Growth, of March 28, 2017, ordered all federal agencies to apply cost-benefit analyses to regulations of greenhouse gas emissions and evaluations of the social cost of carbon, nitrous oxide, and methane.

State

With the passage of legislation including State Senate and Assembly bills and executive orders, California has been innovative and proactive in addressing greenhouse gas emissions and climate change.

Assembly Bill 1493, Pavley Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board to develop and implement regulations to reduce automobile and light truck greenhouse gas emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

[8] http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256 and https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse

Executive Order S-3-05 (June 1, 2005): The goal of this order is to reduce California's greenhouse gas emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill 32 in 2006 and SB 32 in 2016.

Assembly Bill 32 (AB 32), Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 greenhouse gas emissions reduction goals as outlined in Executive Order S-3-05, while further mandating that the Air Resources Board create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." The Legislature also intended that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020 (Health and Safety Code Section 38551(b)). The law requires the Air Resources Board to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective greenhouse gas reductions.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard (LCFS) for California. Under this order, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by the year 2020. The Air Resources Board re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 greenhouse gas reduction goals.

Senate Bill 97 (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing greenhouse gas emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires Air Resources Board to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land use, and housing policies to plan how it will achieve the emissions target for its region.

Senate Bill 391 (SB 391), Chapter 585, 2009, California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

Executive Order B-16-12 (March 2012): This order required state entities under the direction of the governor, including the Air Resources Board, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

Executive Order B-30-15 (April 2015): This order established an interim statewide greenhouse gas emission 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. It further orders all state agencies with jurisdiction over sources of greenhouse gas emissions to implement measures, pursuant to statutory authority, to achieve reductions of greenhouse gas emissions to meet the 2030 and 2050 greenhouse gas emissions reductions targets. It also directs the Air Resources Board to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent (MMTCO2e). Finally, it requires the Natural Resources Agency to update the state's climate adaptation strategy, Safeguarding California, every 3 years, and to ensure that its provisions are fully implemented.

Senate Bill 32, (SB 32) Chapter 249, 2016: This bill codifies the greenhouse gas reduction targets established in Executive Order B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

Environmental Setting

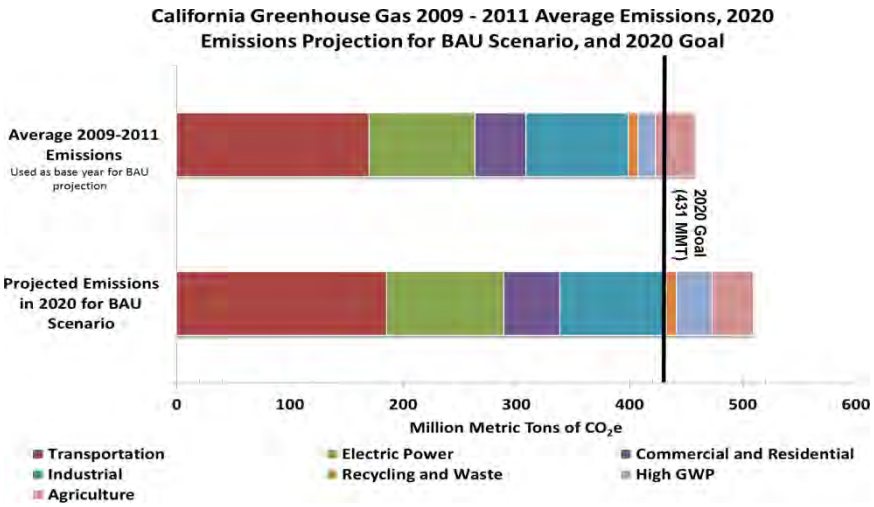
In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce greenhouse gas emissions in California. AB 32 required the Air Resources Board to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing greenhouse gas emissions to 1990 levels by 2020. The Scoping Plan was first approved by the Air Resources Board in 2008 and must be updated every 5 years. The second updated plan, *California's 2017 Climate Change Scoping Plan*, adopted on December 14, 2017, reflects the 2030 target established in EO B-30-15 and SB 32.

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce greenhouse gas emissions. As part of its supporting documentation for the updated Scoping Plan, the Air Resources Board released the 2017 greenhouse gas inventory for California. The Air Resources Board is responsible for maintaining and updating California's Greenhouse Gas Inventory per Health and Safety Code Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in **Figure 3-1: 2020 Business as Usual (BAU) Emissions Projection 2014 Edition** represent a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists the Air Resources Board in demonstrating progress toward meeting the 2020 goal of 431 MMTCO2e.[9] The 2018 edition of the greenhouse gas emissions inventory found total California emissions of 429 MMTCO2e for 2016.

The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery. The total emissions expected in the 2020 BAU scenario include reductions anticipated from Pavley I and the Renewable Electricity Standard (30 MMTCO2e total). With these reductions in the baseline, estimated 2020 statewide BAU emissions are 509 MMTCO2e.

Figure 3-1: 2020 Business as Usual (BAU) Emissions Projection 2014 Edition



https://www.arb.ca.gov/cc/inventory/data/bau.htm

[9] The revised target using Global Warming Potentials (GWP) from the Intergovernmental Panel on Climate Change Fourth Assessment Report (AR4)

Project Analysis

An individual project does not generate enough greenhouse gas emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its incremental change in emissions when combined with the contributions of all other sources of greenhouse gas.[10] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination, you must compare the incremental impacts of the project with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

Greenhouse gas emissions for transportation projects can be divided into those produced during operations and those produced during construction. The following represents a best faith effort to describe the potential greenhouse gas emissions related to the project.

Operational Emissions

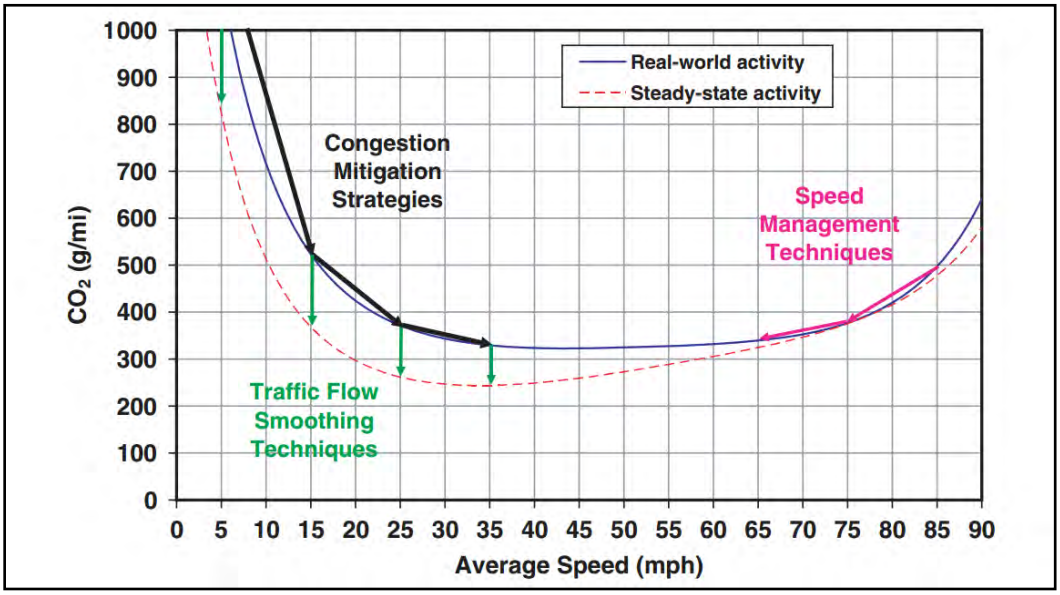
Four main strategies can reduce greenhouse gas emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to lower greenhouse gas-emitting fuels, and (4) improving vehicle technologies/ efficiency. To be most effective, all four strategies should be pursued concurrently.

The Federal Highway Administration supports these strategies to lessen climate change impacts, which correlate with efforts that the State of California is undertaking to reduce greenhouse gas emissions from the transportation sector.

The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (see **Figure 3-2: Possible Use of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions** above). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, greenhouse gas emissions, particularly CO_2, may be reduced.

[10] This approach is supported by the Association of Environmental Professionals: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

Figure 3-2: Possible Use of Traffic Operation Strategies in Reducing On-Road C0$_2$ Emissions



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside, May 2010 (https://www.researchgate.net/publication/46438207)

The project is listed in the San Joaquin Council of Governments' 2018 Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS): "*The proposed interchange improvement project is part of an overall regional strategy that is expected to meet or exceed the regional GHG reduction target of ten percent per capita by 2035 (compared to 2005 baseline).*"

The State Route 99/State Route 120 project has been identified by the Regional Transportation Plan as one of the highest priority projects. The project would help to relieve congestion and would therefore lead to greenhouse gas reductions. As discussed in Section 2.1.5 Traffic and Transportation/Pedestrian and Bicycle Facilities, the interchange is heavily used and is operating below the standard level of service. The improvements included within the project would increase level of service and would reduce traffic delays. State Route 99 provides major movement of goods throughout the region and is valuable to the regional economy.

The design concept and scope of the project is consistent with the project description in the 2018 Regional Transportation Plan, 2019 Federal Transportation Improvement Program, and the "open to traffic" assumptions of the San Joaquin Council of Governments' regional emissions analysis. Completion of Phase 1A is anticipated in 2023, which would improve the eastbound State Route 120 to southbound State Route 99 traffic movement. Completion of Phase 1B is anticipated to occur concurrently or subsequently

to Phase 1C and would improve the northbound State Route 99 to westbound State Route 120 traffic movement.

Quantitative Analysis

Table 3-2: Modeled Annual CO_2 Emissions and Vehicle Miles Traveled, by Alternative provides the vehicle miles traveled (VMT) projections for the no-build scenario as well as the build alternative, along with the CO_2 emission results for the existing conditions/baseline year (2017), construction year 2023 (Phase 1A) 2023, and design year 2043 (Phase 1A, 1B, and 1C buildout conditions), as determined by the Traffic Operations Analysis Report (as listed in the List of Technical Studies at the end of this document).

Table 3-2: Modeled Annual CO_2 Emissions and Vehicle Miles Traveled, by Alternative

Alternative	CO_2 Emissions (Metric Tons/Year)	Annual Vehicle Miles Traveled[1]
Existing/Baseline (2017)	76,140	157,523,582
Construction Year 2023		
No-Build Alternative	84,931	206,907,685
Build Alternative (Phase 1A)	79,888	194,938,979
Design-Year 2043		
No Build Alternative	74,117	232,913,913
Build Alternative (Phases 1A, 1B, and 1C)	74,474	236,983,737

CO_2 = carbon dioxide
Source: *Air Quality Report State Route 99/State Route 120 Interchange Connector Project*, Terry A. Hayes Associates, Inc. (TAHA), pg. 43, Table 4-4 Modeled Annual CO_2 Emissions and Vehicle Miles Traveled, by Alternative, August 2018.
[1] Annual VMT values derived from Daily VMT values multiplied by 347, per ARB methodology (ARB 2008).

Table 3-2 shows that under construction year 2023 conditions, the No-Build Alternative would generate more metric tons per year of CO_2 emissions compared to the Build Alternative (Phase 1A). The CO_2 emissions in design year 2043 for the No-Build Alternative would be nominally lower when compared to the Build Alternative (Phases 1A, 1B, and 1C). The Build Alternative (Phase 1A) CO_2 emissions in construction year 2023 are anticipated to be higher when compared to existing conditions due to the continued population growth in the region and the increase in vehicle miles traveled during the 6-year time period. The Build Alternative (Phase 1A) CO_2 emissions in construction year 2023 shows an improvement when compared to emissions associated with the No-Build Alternative. Greenhouse gas emissions decrease in 2043 compared to the existing condition in the study area due mostly to fleet turnover and improvements in exhaust controls. When compared to the No-Build Alternative, the Build Alternative (Phase 1A) in construction year 2023 would result in reduced annual greenhouse gas

emissions due to improved traffic flow. CO_2 emissions under the Build Alternative (Phases 1A, 1B, and 1C) would be slightly higher than No-Build Alternative emissions in the design year 2043 conditions, but emissions under both the No-Build Alternative and Build Alternative (Phases 1A, 1B, and 1C) in design year 2043 would be less than emissions generated in 2023. The slight increase in greenhouse gas emissions caused by implementation of the Build Alternative (Phases 1A, 1B, and 1C) in design year 2043 is attributed to the increase in vehicle miles traveled from planned (regional/local) growth, which is accommodated by the expanded capacity and congestion improvements of the project. Improved operations under the project would also contribute to reduced fuel consumption, despite the increase in vehicle miles traveled (as described in the Traffic Operations Analysis Report).

While emission factors (EMFAC) has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its emission rates are based on tailpipe emission test data and have limitations. The EMFAC-based CO_2 emissions estimates are used for comparison of alternatives. However, the model does not account for factors such as the vehicle operation mode (e.g., rate of acceleration) and the vehicles' aerodynamics, which would influence CO_2 emissions. The Air Resources Board's greenhouse gas inventory follows the Intergovernmental Panel on Climate Change guideline by assuming complete fuel combustion, while still using EMFAC data to calculate CH_4 and N_2O emissions.

Limitations and Uncertainties with Modeling

Emission Factors

Although EMFAC can calculate CO_2 emissions from mobile sources, the model does have limitations when it comes to accurately reflecting changes in CO_2 emissions due to impacts on traffic. According to the National Cooperative Highway Research Program report, *Development of a Comprehensive Modal Emission Model* (April 2008) and a 2009 University of California study (Barth & Boriboonsomsin 2016), brief but rapid accelerations, such as those occurring during congestion, can contribute significantly to a vehicle's CO_2 emissions during a typical urban trip. Current emission-factor models do not distinguish the emission of such modal events (i.e., acceleration, deceleration) in the operation of a vehicle and instead estimate emissions by average trip speed. It is difficult to model this because the frequency and rate of acceleration or deceleration that drivers chose to operate their vehicles depend on each individual's human behavior, their reaction to other vehicles' movements around them, and their acceptable safety margins. Currently, the EPA and the California Air Resources Board have not approved a modal emissions model that is capable of conducting such detailed modeling. This limitation is a factor to consider when comparing the model's estimated emissions for various project alternatives against a baseline value to determine impacts.

Other Variables

With the current understanding, project-level analysis of greenhouse gas emissions has limitations. Although a greenhouse gas analysis is included for this project, there are numerous external variables that could change during the design life of the project and would thus change the projected CO_2 emissions.

First, vehicle fuel economy is increasing. The U.S. EPA's annual report, "Light-Duty Automotive Technology and Fuel Economy Trends: 1975 through 2016" (2016) which provides data on the fuel economy and technology characteristics of new light-duty vehicles including cars, minivans, sport utility vehicles, and pickup trucks, confirms that average fuel economy improves each year with a noticeable rate of change beginning in 2005. Corporate Average Fuel Economy (CAFE) standards remained the same between model years 1995 and 2003, subsequently increasing to higher fuel economy standards for future vehicle model years. The U.S. EPA estimates that light duty fuel economy rose by 29 percent from model year 2004 to 2015, attributed to new technology that improved fuel economy while keeping vehicle weight relatively constant. **Table 3-3: Average Required Fuel Economy (miles per gallon)** shows the increases in required fuel economy standards for cars and trucks between Model Years 2012 and 2025, from the National Highway Traffic Safety Administration for the 2012–2016 and 2017–2025 CAFE Standards.

Table 3-3: Average Required Fuel Economy (miles per gallon)

Vehicle Type	2012	2013	2014	2015	2016	2017	2018	2020	2025
Passenger Cars	33.3	34.2	34.9	36.2	37.8	39.6-40.1	41.1-41.6	44.2-44.8	55.3-56.2
Light Trucks	25.4	26	26.6	27.5	28.8	29.1-29.4	29.6-30.0	30.6-31.2	39.3-40.3
Combined	29.7	30.5	31.3	32.6	34.1	35.1-35.4	36.1-36.5	38.3-38.9	48.7-49.7

Sources: EPA and NHTSA 2010, 2012. https://www.epa.gov/regulations-emissions-vehicles-and-engines/regulations-greenhouse-gas-emissions-passenger-cars-and U.S. EPA 2012, https://www.epa.gov/regulations-emissions-vehicles-and-engines/final-rule-model-year-2017-and-later-light-duty-vehicle#rule-summary

Second, new lower-emission and zero-emission vehicles will come into the market within the expected design life of this project. According to the 2013 Annual Energy Outlook (U.S. EIA 2013):

> Light Duty Vehicles that use diesel, other alternative fuels, hybrid-electric, or all-electric systems play a significant role in meeting more stringent GHG emissions and CAFE standards over the projection period. Sales of

> such vehicles increase from 20 percent of all new Light Duty Vehicle sales in 2011 to 49 percent in 2040 in the AEO2013 Reference case. (U.S. EIA 2013)

The greater percentage of lower-emissions and zero-emissions vehicles on the road in the future will reduce overall greenhouse gas emissions as compared to scenarios in which vehicle technologies and fuel efficiencies do not change.

Third, California adopted a low-carbon transportation fuel standard in 2009 to reduce the carbon intensity of transportation fuels by 10 percent by 2020. The regulation became effective on January 12, 2010 (codified in title 17, California Code of Regulations, Sections 95480-95490). Beginning January 1, 2011, transportation fuel producers and importers must meet specified average carbon intensity requirements for fuel in each calendar year.

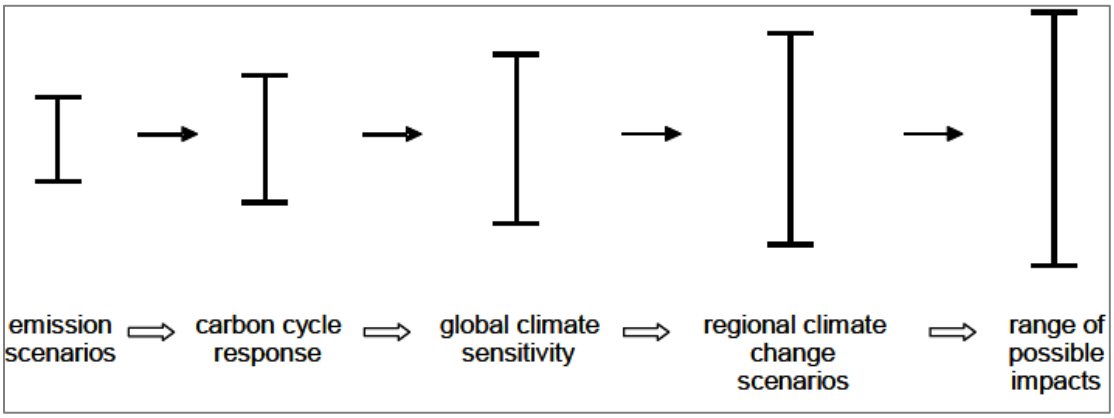
Limitations and Uncertainties with Impact Assessment

Figure 3-3: Cascade of Uncertainty in Climate Change Simulations illustrates how the range of uncertainties in assessing greenhouse gas impacts grows with each step of the analysis, as noted in the *National Highway Traffic Safety Administration Final EIS for MY2017–2025 CAFE Standards* (NHTSA 2012):

> Moss and Schneider (2000) characterize the 'cascade of uncertainty' in climate change simulations (**Figure 3-3**). As indicated in **Figure 3-3**, the emission estimates … have narrower bands of uncertainty than the global climate effects, which are less uncertain than regional climate change effects. The effects on climate are, in turn, less uncertain than the impacts of climate change on affected resources (such as terrestrial and coastal ecosystems, human health, and other resources …). Although the uncertainty bands broaden with each successive step in the analytic chain, all values within the bands are not equally likely; the mid-range values have the highest likelihood.[11]

[11] http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/FINAL_EIS.pdf. page 5-21

Figure 3-3: Cascade of Uncertainty in Climate Change Simulations



Source: National Highway Traffic Safety Administration Final EIS for MY2017-2025 CAFE Standards (July 2012). Page 5-22.

Much of the uncertainty in assessing an individual project's impact on climate change surrounds the global nature of the climate change. Even assuming that the target of meeting the 1990 levels of emissions is met, there is no regulatory or other framework in place that would allow for a ready assessment of what any modeled increase in CO_2 emissions would mean for climate change given the overall California greenhouse gas emissions inventory of approximately 430 million tons of CO_2 equivalent. This uncertainty only increases when viewed globally. The Intergovernmental Panel on Climate Change has created multiple scenarios to project potential future global greenhouse gas emissions as well as to evaluate potential changes in global temperature, other climate changes, and their effect on human and natural systems. These scenarios vary in terms of the type of economic development, the amount of overall growth, and the steps taken to reduce greenhouse gas emissions. Non-mitigation Intergovernmental Panel on Climate Change scenarios project an increase in global greenhouse gas emissions by 9.7 up to 36.7 billion metric tons CO_2 from 2000 to 2030, which represents an increase of between 25 and 90 percent.[12]

The assessment is further complicated by the fact that changes in greenhouse gas emissions can be difficult to attribute to a particular project because the projects often cause shifts in the locale for some type of greenhouse gas emissions, rather than causing "new" greenhouse gas emissions. It is difficult to assess the extent to which any project-level increase in CO_2 emissions represents a net global increase, reduction, or no change; there are no models approved by regulatory agencies that operate at the global or even statewide scale.

[12] Intergovernmental Panel on Climate Change (IPCC). February 2007. *Climate Change 2007: The Physical Science Basis: Summary for Policy Makers*. https://www.ipcc.ch/publications_and_data/ar4/wg1/en/spm.html

Construction Emissions

Construction greenhouse gas emissions would result from material processing, onsite construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

In addition, with innovations such as longer pavement lives, improved traffic management plans, and changes in materials, the greenhouse gas emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

Construction-related greenhouse gas emissions were calculated using the *Sacramento Metropolitan Air Quality Management District Road Construction Emissions Model*. While the model was developed for Sacramento conditions in terms of fleet emission factors, silt, loading, and other model assumptions, it is considered adequate for estimating road construction emissions by the San Joaquin Valley Air Pollution Control District (under its Indirect Source regulations) and the South Coast Air Quality Management District (in its CEQA guidance) and is used for that purpose in this project analysis. Assuming a project start year of 2021, and complete construction duration (for Phases 1A, 1B, and 1C) of 33 months, the project would produce a total of 4,743.9 tons of CO_2, with a maximum of 14.9 pounds per day. Air quality avoidance and minimization measures **AQ-1**, **AQ-2,** and **AQ-3** would contribute to a reduction of construction greenhouse gas emissions by improving fuel efficiency from construction equipment. Furthermore, the project would incorporate greenhouse gas reduction measures GHG-1, GHG-2, and GHG-3 as recommended in the San Joaquin Council of Governments Regional Transportation Plan/Sustainable Communities Strategy.

CEQA Conclusion

Implementation of the project would result in a slight increase in greenhouse gas emissions during construction. As discussed above, construction year 2023 emissions with and without project (Phase 1A) show increases in CO_2 emissions over the existing baseline (2017) levels. The CO_2 emissions under construction year 2023 with-project conditions (Phase 1A) would be lower by 5,043 metric tons per year than the construction year 2023 without-project (Phase 1A) conditions, indicating an improvement in greenhouse gas emissions with project Phase 1A implementation. Under the design year 2043 without-project (Phases 1A, 1B, and 1C) conditions, CO_2 emissions are anticipated to be 74,117 metric tons/year, whereas design year 2043 with-project conditions (Phase 1A, 1B, and 1C) are anticipated to emit 74,474 metric tons per year of CO_2, indicating a relatively small increase. The increase in greenhouse gas emissions caused by implementation of the project (Phases 1A, 1B, and 1C) in design year 2043 is attributed to the

increase in vehicle miles traveled accommodated by the expanded capacity and alleviated congestion.

While the proposed Project will result in GHG emissions during construction, it is anticipated the Project will not result in any increase in operational GHG emissions. In fact, the proposed Project will lower emissions at Design Year when compared to the existing setting. The proposed Project does not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gasses. Because there is a reduction in future emissions with the Project compared to existing emissions, there is still evidence of substantial progress in reducing emissions even with the minimal increase over future no-build emissions; therefore, impacts to GHG emissions would be less than significant. With the implementation of GHG-reduction measures AQ 1-3, GHG 1-3, and TRA-1 these impacts would be further reduced.

Greenhouse Gas Reduction Strategies

Statewide Efforts

In an effort to further the vision of California's greenhouse gas reduction targets outlined in AB 32 and SB 32, then-Governor Edmund G. Brown Jr. identified key climate change strategy pillars (concepts). See **Figure 3-4: Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals**. These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 greenhouse gas emissions target. These pillars are (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy-efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, Safeguarding California.

Figure 3-4: Governor's Climate Change Pillars: 2030 Greenhouse Gas Reduction Goals



The transportation sector is integral to the people and economy of California. To achieve greenhouse gas emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. Greenhouse gas emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. One of then-Governor Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030.

Then-Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the Air Resources Board works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Executive Order B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut greenhouse gas emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas emissions. The plan defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all other statewide transportation planning documents.

SB 391(Liu 2009) requires the California Transportation Plan to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible greenhouse gas emission reductions while meeting the state's transportation needs. While Metropolitan Planning Organizations have primary responsibility for identifying land use patterns to help reduce greenhouse gas emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan

The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce greenhouse gas emissions, among other goals. Specific performance targets in the plan that will help to reduce greenhouse gas emissions include the following:

- Increasing percentage of non-auto mode share
- Reducing vehicle miles traveled per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) greenhouse gas emissions

Funding and Technical Assistance Programs

In addition to developing plans and performance targets to reduce greenhouse gas emissions, Caltrans also administers several funding and technical assistance programs that have greenhouse gas reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in Caltrans Activities to Address Climate Change (2013).

The Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a department policy that will ensure coordinated efforts to incorporate climate change into departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

Project-Level Greenhouse Gas Reduction Strategies

The following measures will also be implemented in the project to reduce greenhouse gas emissions and potential climate change impacts from the project.

Compliance with Caltrans Standard Specifications, Standard Special Provisions, and Nonstandard Special Provisions would reduce greenhouse gas emissions during construction. These specifications and provisions include proper maintenance of construction equipment to control exhaust emissions; shutting down equipment when not in use; limiting hours of operation and amount of equipment in use at one time; and curtailing construction activities during periods of high concentrations of ambient air pollutants.

In addition, the project will include the following standard specifications (common to all Caltrans projects) that help reduce greenhouse gas emissions:

- Section 7-1.02A and 7-1.02C, Emissions Reduction, mandate that contractors comply with laws, regulations, orders, and decrees applicable to the project, which include compliance with air quality and other environmental laws, orders, and regulations that could affect greenhouse gas emissions.
- Section 14-9.02, Air Pollution Control, also requires compliance with air-pollution-control rules, regulations, ordinances, and statutes, and reduces greenhouse gases to the extent that compliance reduces emissions of CO_2, black carbon, and other greenhouse gases and greenhouse gas precursors.

Further, under avoidance and minimization measure **AES-1,** the project will provide replacement highway planting and landscape improvements within the highway right-of-way at the Austin Road/ State Route 99 interchange. Retaining vegetation helps absorb CO_2.

The project will also implement a Traffic Management Plan to minimize traffic delays and idling emissions during construction:

TRA-1 The project will be required to prepare and implement a Traffic Management Plan to address short-term disruptions in existing circulation patterns during construction; the Traffic Management Plan will identify the locations of temporary detours and signage to facilitate local traffic patterns and through-traffic requirements.

Finally, the project will include measures outlined in San Joaquin Council of Governments' 2018 Regional Transportation Plan/Sustainable Communities Strategy to further reduce greenhouse gas emissions. These avoidance and

minimization measures address greenhouse gas emissions as well as energy use during construction and operation of the project.

GHG-1 The project would ensure that applicable greenhouse gas-reducing diesel particulate and NO_X emissions measures for off-road construction vehicles are implemented during construction. The measures would be noted on all construction plans and the project sponsor would perform periodic site inspections. Applicable greenhouse gas-reducing measures include the following:

- Use of diesel construction equipment meeting Air Resources Board's Tier 2 certified engines or cleaner off-road heavy-duty diesel engines, and comply with the State Off-Road Regulation.
- Use of on-road heavy-duty trucks that meet the Air Resources Board's 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation.
- All on- and off-road diesel equipment would not idle for more than 5 minutes. Signs would be posted in the designated queuing areas and or job sites to remind drivers and operators of the 5-minute idling limit.
- Use of electric equipment in place of diesel-powered equipment, where feasible.
- Substitute gasoline-powered in place of diesel-powered equipment, where feasible.
- Use of alternatively fueled construction equipment on-site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.

GHG-2 All lighting installed by the project will be energy-efficient and designed to use the least amount of energy to serve the purpose of the lighting. Lighting would use solar energy wherever feasible.

GHG-3 New landscaping design and irrigation systems installed by the project will be water-efficient.

Adaptation Strategies

"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage—or, put another way, planning and design for resilience. Climate change is expected to produce

increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

Federal Efforts

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Quality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011,[13] outlining the federal government's progress in expanding and strengthening the nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provided an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

The Federal Department of Transportation issued a U.S. Department of Transportation Policy Statement on Climate Adaptation in June 2011, committing to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of U.S. Department of Transportation in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions."[14]

To further the U.S. Department of Transportation Policy Statement, in December 15, 2014, the Federal Highway Administration issued order 5520 (*Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events*).[15] This directive established a Federal Highway Administration policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The Federal Highway Administration will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.

[13] https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/resilience
[14] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[15] https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm

The Federal Highway Administration has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels.[16]

State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed Executive Order S-13-08, which directed a number of state agencies to address California's vulnerability to sea-level rise caused by climate change. This order set in motion several agencies and actions to address the concern of sea-level rise and directed all state agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea-level rise. Sea-level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, and storm surge and storm wave data.

Then-Governor Schwarzenegger also requested the National Academy of Sciences to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, Sea-Level Rise for the Coasts of California, Oregon, and Washington (Sea-Level Rise Assessment Report),[17] was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates, and the range of uncertainty in selected sea-level rise projections. It provided a synthesis of existing information on projected sea-level rise impacts to state infrastructure (such as roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems, and a discussion of future research needs regarding sea-level rise.

In response to Executive Order S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, state, federal, and public and private entities, developed The California Climate Adaptation Strategy (Dec 2009),[18] which summarized the best available science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across state agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as Safeguarding California: Reducing Climate Risk (Safeguarding California Plan).

[16] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[17] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.
[18] http://www.climatechange.ca.gov/adaptation/strategy/index.html

Then-Governor Jerry Brown enhanced the overall adaptation planning effort by signing Executive Order B-30-15 in April 2015, requiring state agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how state agencies are implementing Executive Order B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

Executive Order S-13-08 also gave rise to the *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), of which Caltrans is a member. First published in 2010, the document provided "guidance for incorporating sea-level rise (SLR) projections into planning and decision making for projects in California," specifically, "information and recommendations to enhance consistency across agencies in their development of approaches to SLR."[19]

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation, and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is actively engaged in working toward identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in Executive Order B-30-15.

The project is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

[19] http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/

Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation, the level of analysis required, and to identify potential impacts and mitigation measures and related environmental requirements. Agency consultation and public participation for the project have been accomplished through a variety of formal and informal methods, including: project development team meetings and interagency coordination meetings. Also, local groups and individuals were notified of the project and invited to comment.

This chapter summarizes the results of efforts to identify, address, and resolve project-related issues through early and continuing coordination.

Public Agencies

Agencies were formally or informally contacted and consulted during the preparation of this environmental document. Also, local groups and individuals were notified of the project and invited to comment. All relevant federal, state, and local agencies, organizations, and other interested entities and individuals would receive a Notice of Availability of this environmental document.

Coordination Regarding Cultural Resources

Native American Consultation

The Native American Heritage Commission was contacted on August 25, 2017 to request that they review their Sacred Lands File for any resources that might be affected by the project. Also requested were the names of Native Americans who might have information or concerns about the project. In an email response dated August 31, 2017, Ms. Sharaya Souza, Staff Services Analyst, indicated that the Sacred Lands File search was completed for the area of potential effect with negative results.

On October 2, 2017, letters describing the project and maps showing the area of potential effect were sent to the Native American contacts provided by the Native American Heritage Commission, asking for any information or concerns regarding cultural resources in the area of potential effect. No response to the letters was received within two weeks, and follow-up calls were made on October 17, 2017. Most follow-up phone calls that were made resulted in messages being left with no call-back; however, a representative from the Buena Vista Rancheria indicated that if virgin soils were involved in project construction, then the Buena Vista Rancheria would like to be contacted.

Historical Society Consultation

On August 28, 2017, a letter describing the project and maps showing the area of potential effect were sent to the Manteca Historical Society and San Joaquin County Historical Society requesting any information or concerns they may have about the project. The Manteca Historical Society indicated that it had no comments or concerns regarding the project. Messages were left with the San Joaquin County Historical Society and staff indicated that their archivist would be in contact if there was concern about the project.

State Historic Preservation Officer

On December 10, 2018, the Office of Historic Preservation received a letter from Caltrans initiating consultation with the State Historic Preservation Officer regarding the project. On January 10, 2019, the State Historic Preservation Officer wrote a letter to Caltrans stating the State Historic Preservation Officer concurs that the resources within the project vicinity are not eligible for listing on the National Register of Historic Places. The letter has been included below.

Environmental Protection Agency/Federal Highway Administration Concurrence

On October 9, 2018, the San Joaquin Council of Governments prepared a memo that was sent to the Interagency Consultation Partners to concur that the project is not a “project of air quality concern.” The Interagency Consultation Partners reviewed the memo and, on October 11, 2018, the Environmental Protection Agency concurred that the project was not a “project of air quality concern.” On October 12, 2018, the Federal Highway Administration (via Caltrans) indicated that the project was not a “project of air quality concern.” The Interagency Consultation Partners process was completed on October 12, 2018.

Public Outreach

Caltrans District 10, working with the City of Manteca and San Joaquin Council of Governments, held a Public Workshop in Manteca for the project on August 2, 2017. The Public Workshop provided members of the public and other interested parties an opportunity to provide comments, concerns, or suggestions that could be addressed during this outreach period. The Public Workshop was publicized through an invitation sent by first-class U.S. mail, a news release to print and broadcast media that serve the Manteca area, newspaper advertisements, and the San Joaquin Council of Governments and City of Manteca websites. Seventy-two people signed in at the Public Workshop, including 15 members of the project team and 57 members of the public and elected officials. The meeting was conducted as an open house workshop with informational display exhibits. Members of the project team were available throughout the open house to receive comments and answer questions. Each attendee was provided with a printed agenda and a comment sheet. Representatives from Caltrans, the City of Manteca, the San Joaquin

Council of Governments, and the consultant team staffed the information stations. Twelve comment sheets were received at the meeting. Oral comments and suggestions from local residents and community members were also received by project personnel attending the meeting. Main topics/concerns expressed by member of the public and elected officials included:

- Need for an overpass over the railway track between Woodward and Moffatt
- Keep Austin Road Interchange (11 opinions)
    - It is imperative to have an on-ramp at Austin Road to provide access to State Route 99 (provided my Manteca Fire Department)
    - Eliminating current State Route 99 access to/from Austin Road would be devastating to locals
    - Access to both north and southbound Austin Road is needed
    - Keep Austin Road interchange and perhaps move a safe distance to the east
    - Proposes Moffatt off-ramp in new location makes no sense-need to adapt the one in the current location
    - Closing Austin on/off-ramps creates a huge problem for local businesses
    - Keep Austin Road on/off-ramps open
    - Need to reconsider elimination of Austin Road exit between Phases
- Project is minimal benefit to residents of Manteca
- Add a lane to exit bypass to southbound State Route 99
- Discourage the pattern of exiting the bypass on McKinley, Airport, or Union, driving south to access West Ripon Road
- Need to improve local flow in AM/PM peak periods (e.g., overpass at Moffatt)
- Current plan has the potential effect on the State Route 120 corridor to allow flooding
- Need more information on landscaping design

During the public review period, eight (8) comment letters were received. Five (5) letters were from the public and three (3) letters were from public agencies. A couple of the public comment letters that were received required revisions/clarifications to be added to this Final IS/MND. The public agency comment letters that were received did not require revisions/clarifications to this document.

Public Comments

Caltrans circulated the Draft IS/MND for the Project for public review and agency review, for 30 days, commencing on April 26, 2019 and ending on May 25, 2019. The following comment letters (five public comment letters and three public agency letters) were received on the May 2019 Draft IS/MND:

- JoAnn Connor Email (May 10, 2019)
- San Joaquin County Department of Public Works (May 20, 2019)
- Herum Comment Letter (May 20, 2019)
- Billy Betschart Comment Letter (May 21, 2019)
- Antoinette Betschart Comment Letter (May 20, 2019)
- CDFW Email (May 25, 2019)
- Will Fassler Comment Letter (Undated)
- State of California Governor's Office of Planning and Research State Clearinghouse and Planning Unit Public Review Completion Letter (May 29, 2019)

State Historic Preservation Officer Concurrence

State of California • Natural Resources Agency
Gavin Newsom, *Governor*

DEPARTMENT OF PARKS AND RECREATION
OFFICE OF HISTORIC PRESERVATION
Lisa Ann L. Mangat, *Director*

Julianne Polanco, State Historic Preservation Officer
1725 23rd Street, Suite 100, Sacramento, CA 95816-7100
Telephone: (916) 445-7000 FAX: (916) 445-7053
calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

January 10, 2019

VIA ELECTRONIC MAIL

Reply in Reference To: FHWA_2018_1210_001

Mr. Benjamin Broyles, Branch Chief
California Department of Transportation
Northern San Joaquin Valley Cultural Branch
District 10
1976 E. Dr. Martin Luther King Jr. Blvd
Stockton CA 95205

Subject: Determination of Eligibility for the Proposed State Route 99 at State Route 120 Interchange Improvements, San Joaquin County, California (10-SJ-99, PM 3.1/6.2; 10-SJ-120, PM R5.1/T7.2)

Dear Mr. Broyles:

On December 10, 2018, the Office of Historic Preservation (OHP) received a letter from the California Department of Transportation (Caltrans) initiating consultation with the State Historic Preservation Officer (SHPO) regarding the above referenced undertaking. Caltrans is consulting with the SHPO in accordance with the January 1, 2014 *First Amended Programmatic Agreement Among the Federal Highway Administration (FHWA), the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (Section 106 PA).

In accordance with Stipulation VIII.C.6 of the Section 106 PA, Caltrans is seeking SHPO concurrence on determinations of eligibility. Caltrans also submitted the following:

- Historic Property Survey Report (HPSR).
- Archaeological Survey Report (ASR).
- Project Vicinity, Location, and Area of Potential Effect (APE) maps.
- Historical Resources Evaluation Report (HRER).

Caltrans District 10, with the cooperation of the City of Manteca and the San Joaquin Council of Governments, proposes to reconstruct the existing State route (SR) 99/120 interchange. A more detailed description of the undertaking and the area of potential effects (APE) are on pages one and two of the HPSR.

Caltrans' efforts resulted in the identification of six architectural resources requiring evaluation according to the National Register of Historic Places (NRHP) criteria. Pursuant to Stipulation VIII.C.6 of the Section 106 PA, Caltrans requests SHPO concurrence that the following are not eligible for listing on the NRHP:

Name	Address	APN	Property Type
Van Till Ranch	N/A	228-050-18	Residential
20270 S. SR 99 E. Frontage Road	20270 S. SR 99 E. Frontage Road	228-060-15	Residential
2090 S. Austin Road	2090 S. Austin Road	228-060-24	Residential
Betschart Dairy	2075 S. Austin Road	228-060-17	Residential
2252 S. Austin Road	2252 S. Austin Road	228-060-27	Residential
Betschart House	2065 S. Austin Road	224-5050-16	Residential

Upon review of the documentation submitted by Caltrans, **I concur** that the above listed resources are not eligible for listing on the NRHP.

Please be advised that under certain circumstances, such as post-review discoveries or a change in the undertaking description, Caltrans may have future responsibilities for this undertaking under the Section 106 PA. If you have questions, please do not hesitate to contact State Historian Natalie Lindquist at (916) 445-7014 or at natalie.lindquist@parks.ca.gov.

Sincerely,

Julianne Polanco
State Historic Preservation Officer

Chapter 5 List of Preparers

This document was prepared by the following individuals:

Bender Rosenthal Incorporated – Relocation Impact Statement and Last Resort Housing Plan for the State Route 99/State Route 120 Project

Mike Lahodny, Senior Appraiser, Right of Way Specialist. B.S. Geography/Urban Planning/Real Estate, California State University, Northridge. 46 years of experience in Uniform Act and Right of Way process and procedures. Contribution: Relocation Impact Statement and Right-of-Way Data Sheet.

Blackburn Consulting – Aerially Deposited Lead Assessment

Laura Long, Environmental Engineer. M.S. Mechanical Engineering & Material Science, Duke University, and B.S. Biology, Management, Rensselaer Polytechnic Institute. 21 years of experience in public, corporate, and military environmental engineering. Contribution: Aerially Deposited Lead Assessment.

Caltrans

Allam Alhabaly, Transportation Engineer. B.S., California State University, Fresno, School of Engineering; 17 years of experience in environmental technical studies, with emphasis on noise studies. Contribution: document review.

Jon L. Brady, Associate Environmental Planner/Architectural Historian. M.A., History, California State University, Fresno; B.A., Political Science and Anthropology; more than 30 years of experience as a consulting archaeologist and historian. Contribution: document review.

Laura Cook, Associate Environmental Planner (Archeology), PQS Co-PI Prehistoric/Historical Archaeology. M.A. candidate, Archaeology and Heritage, University of Leicester, U.K.; B.A. Anthropology (Archaeology emphasis), U.C. Davis; 10 years professional archaeology/CRM experience. Contribution: document review.

Jennifer Lugo, Senior Environmental Planner. M.A., History, California State University, Fresno; B.A., History, Minor in Political Science, California State University, Fresno; 14 years of environmental planning experience. Contribution: document review.

Jason Meigs, Associate Environmental Planner (Natural Sciences). B.A., Environmental Studies, Minor in Biological Sciences, California State University, Sacramento; more than 20 years of environmental planning and biological sciences experience. Contribution: document review.

Shawn Ogletree, Engineering Geologist. B.S., Environmental Conservation of Natural Resources, Texas Tech University; B.S., Wildlife/Fisheries Management, Texas Tech University; MPH, California State University, Fresno; 14 years of environmental health, environmental technical studies experience; 10 years of biology experience. Contribution: document review.

Nathan Roberts, Associate Environmental Planner/Architectural Historian. M.A., Public History, California State University, Sacramento; B.A., History; 4 years of experience as an Architectural Historian. Contribution: document review.

Ken J. Romero, Senior Transportation Engineer. B.S., Civil Engineering, California State University, Fresno; 13 years of environmental technical studies experience. Contribution: document review.

Jane Sellers, Associate Environmental Planner. B.A., Journalism, California State University, Fresno; 18 years of environmental compliance experience, focusing on QA/QC and reviewing and editing NEPA and CEQA environmental documents; 1.5 years of environmental planning (generalist) experience. Contribution: document review.

Juan Torres, Associate Environmental Planner. B.A., Environmental Studies, University of the Pacific, Stockton; 20 years of environmental planning experience. Contribution: Coordination of the environmental process for the project.

Fehr and Peers Transportation Consultants – Final Traffic Operations Analysis Report (FTOAR)

Fred Choa, P.E., Registered Professional Traffic Engineer, Principal. M.S. Civil Engineering, University of California, Berkeley and B.S. Civil Engineering, California State Polytechnic University at Pomona. 24 years of experience in freeway corridor traffic operations analysis, multi-modal transportation planning and traffic engineering. Contribution: Final Traffic Operation Analysis Report.

LSA – Environmental Document, Visual Impact Assessment, Community Impact Assessment Checklist, Natural Environment Study, Archeological Survey Report, Historical Resources Evaluation Report, Paleontological Identification Report/Paleontological Identification Report

Ali Boule, Environmental Planner. B.S. Environmental Management and Protection, California Polytechnic State University, San Luis Obispo. 4 years environmental planning experience. Contribution: Visual Impact Assessment.

Jeff Bray, Principal. B.S. Wildlife Biology, Humboldt State University, Arcata, CA. 25 years of experience performing biological studies for environmental review and managing environmental review. Contribution: review of Natural Environment Study.

Chris Graham, Environmental Planner. B.S. Environmental Science and Resource Management, California State University, Channel Islands. 12 years environmental planning experience. Contribution: environmental document preparation.

Edward Heming, Associate Environmental Planner, A.I.C.P. B.A. Economics and Accounting, University of California Santa Barbara and M.S. Environmental Studies, California State University Fullerton. 16 years environmental planning experience. Contribution: Project Management and review of environmental document.

Kat Hughes, Environmental Planner. Ph.D. Film and Television Studies, University of Glasgow. M.A. Cinema Studies, San Francisco State University. B.A. Anthropology and Women's Studies, University of California, Santa Cruz. 6 years environmental planning experience. Contribution: environmental document preparation and Community Impact Assessment Checklist.

Laura Lafler, Principal. M.L.A. Landscape Architecture/Environmental Planning, University of California, Berkeley, and B.A. Geography/ Environmental Studies, University of California, Los Angeles. 39 years environmental planning experience. Contribution: review of environmental Document.

Mike Trueblood, Senior Biologist. B.S. Wildlife, Fish, and Conservation Biology, University of California, Davis. 19 years of experience performing biological studies for environmental review. Contribution: Natural Environment Study.

Kim Untermoser, Assistant Environmental Planner. B.S. Environmental Studies, California State University, Sacramento. 1 year environmental planning experience. Contribution: environmental document preparation.

Sarah Rieboldt, Ph.D., Paleontologist. Ph.D. Paleontology, University of California, Berkley, and B.A. Biology, Minor in Geology, University of Colorado, Boulder. 6 years of experience performing paleontology studies for environmental review. Contribution: Paleontological Identification Report/Paleontological Evaluation Report.

Anna Van Zuuk, Assistant Biologist/Botanist. B.S. Environmental Horticulture and Urban Forestry, University of California, Davis. 2 years of experience performing biological studies for environmental review. Contribution: Natural Environment Study and wetland delineation.

Katie Vallaire, M.A., RPA Architectural History and Archeology. M.A. Public History, California State University, Sacramento, and B.A. Anthropology, Cultural Resource Management Certificate, California State University, Chico. 5 years of experience in cultural resource management. Contribution: Archeological Survey Report and Historical Resources Evaluation Report.

Dan Williams, Wildlife Biologist. B.S. Geography (Environmental Studies), University of Wisconsin, La Crosse. 13 years of experience performing biological studies for environmental review. Contribution: Natural Environment Study.

Mark Thomas – Engineering Studies and Construction Costs

Gary Horton PE, Project Manager. B.S. Civil Engineering, University of Maryland. 43 years of experience, specializing in highway design and management of transportation projects. Contribution: Project management, engineering studies, and construction costs.

Parikh Consultants, Inc. – Initial Environmental Site Assessment, Hazardous Waste Report, Preliminary Foundation Reports

Gary Parikh, P.E., G.E. #666, Principal-In-Charge. M.S. Geotechnical Engineering, University of Berkeley. 46 years of experience managing and conducting geotechnical investigations and materials engineering services. Contribution: Initial Environmental Site Assessment, Hazardous Waste Report, and Preliminary Foundation Reports.

Terry A. Hayes Associates Inc. – Air Quality Report, Noise Study Report and Noise Abatement Decision Report

Anders Sutherland, Environmental Scientist. B.S. Atmospheric, Oceanic, & Environmental Sciences, University of California, Los Angeles. 9 years of experience in air quality assessment. Contribution: Air Quality Report.

Sam Silverman, Senior Associate. M.S. Environmental Health, University of California, Los Angeles. 18 years of experience preparing Air Quality and Greenhouse Gas Studies and Noise Studies. Contribution: Noise Study Report and Noise Abatement Decision Report.

Chapter 6 Distribution List

The following officials, agencies, and interested parties have receive either a copy of the environmental document or a notice informing them of its availability.

Federal Agencies

- U.S. Army Corps of Engineers
- U.S. Fish and Wildlife Service

State Agencies

- California Air Resources Board
- California Highway Patrol
- California Department of Conservation – Reclamation Board, Farmland Mapping and Monitoring Program Division, Land Resources Protection Division
- California Department of Fish and Wildlife North Central Region (2)
- California Native American Heritage Commission
- California Office of Emergency Services
- California Office of Historic Preservation
- California Public Utilities Commission
- California Regional Water Quality Control Board District 5 Sacramento
- California Natural Resources Agency
- California Transportation Commission
- California Department of Water Resources
- California Highway Patrol – Business Office
- State Water Resources Control Board: Storm Water Regional Control Board: Water Quality

Regional Agencies

- San Joaquin Regional Transit District
- San Joaquin Council of Governments
- San Joaquin Regional Rail Commission

County Agencies

- County of San Joaquin, Community Development Department
- County of San Joaquin, Public Works Department

- County of San Joaquin, Parks and Recreation Department
- San Joaquin County Office of Emergency Services
- San Joaquin County Sheriff's Department

City of Manteca Agencies

- City of Manteca Community Development Division
- City of Manteca Economic Development Division
- City of Manteca Fire Department
- City of Manteca Transit Department
- City of Manteca Parks and Recreation Department
- City of Manteca Police Department
- City of Manteca Public Works Department

City of Ripon Agencies

- City of Ripon Planning Department
- City of Ripon Parks and Recreation Department
- City of Ripon Public Works Department
- City of Ripon Police Department

Other Interested Parties

- Union Pacific Railroad
- Ms. Rhonda Morningstar Pope, Chairperson, Buena Vista Rancheria of Me-Wuk Indians
- Ms. Crystal Martinez-Alire, Chairperson, Ione Band of Miwok Indians
- Mr. Randy Yonemura, Cultural Committee Chair, Ione Band of Miwok Indians
- Ms. Katherine Erolinda Perez, Chairperson, North Valley Yokuts Tribe
- Ms. Lois Martin, Chairperson, Southern Sierra Miwuk Nation
- Mr. Gene Whitehouse, Chairperson, United Auburn Indian Community of the Auburn Rancheria
- Mr. Raymond Hitchcock, Chairperson, Wilton Rancheria

Chapter 7 Response to Comments

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Comment Letter A: JoAnn Connor Email (May 10, 2019)

Comment Letter A

Chris Graham

From: Lugo, Jennifer@DOT <jennifer.lugo@dot.ca.gov>
Sent: Friday, May 10, 2019 9:31 AM
To: Torres, Juan@DOT; Edward Heming
Cc: Padda, Jes S@DOT
Subject: Fwd: 99/120 Project - Your Voicemail

Comments below.

Sent from my iPhone

Begin forwarded message:

From: JoAnn Connor <joannconnor@yahoo.com>
Date: May 10, 2019 at 9:28:10 AM PDT
To: "Lugo, Jennifer@DOT" <jennifer.lugo@dot.ca.gov>
Subject: Re: 99/120 Project - Your Voicemail

Hi Jennifer,

Thank you so much for your kind response. I do have several more questions. Is the interchange going to be physically closer to 767 Bishop Street when finished? If so about how much closer? A-1 Do you think that the construction noise will be heard at Bishop street during construction and at what level? (Some, Medium or Loud) A-2 These are important to me as I need to make sure my tenants are taken care of with a rent reduction. So to know the amount that would make them want to stay your information is important to me.

Those are all my questions. I have glaucoma and it is hard to see the tiny print on some web sites. So thank you.

Sincerely, JoAnn Connor

On Friday, May 10, 2019, 9:13:46 AM PDT, Lugo, Jennifer@DOT <jennifer.lugo@dot.ca.gov> wrote:

Good Morning,

Thank you for your voicemail yesterday about your property located at 767 Bishop Street in Manteca. I checked the Draft Environmental Document (DED), and it looks like your property is not listed as being needed for temporary or permanent acquisition. You also asked about access to the neighborhood. The interchange at Main will be available to use during construction. These topics as well as construction impacts associated with the project are contained within the DED (ex: Chapter 1, Project Description and Project Alternatives, pages 2 and 9; Community Impacts, page 31; Traffic and Transportation, page 38). A-3

You had mentioned that there were issues with accessing the link to the DED. I pasted a few links below for you to try. If these do not work, let me know and we can send you an electronic version of the document. Please read through the document and send any comments you may to have to me via email or US mail by May 25, 2019. Your comments will be officially responded to in the project's Final Environmental Document.

A-3 Con.

http://www.dot.ca.gov/d10/project-docs/sanjoaquin/sr99120interchangeconnector/SR99-120_ED_MasterDocument_2019_26_9_Final_CLEAN.pdf

http://www.dot.ca.gov/d10/x-project-sr99120interchange.html

Thanks again,

Jennifer Lugo

Senior Environmental Planner

Branch Chief – Northern San Joaquin Valley Management Branch 1

855 M Street, Suite 200

Fresno, CA 93721

Desk: (559) 445-6172

Mobile: (559) 779-6612

Response to Comments: Letter A

JoAnn Connor Email (May 10, 2019)

A-1: Caltrans has reviewed the design of the proposed Project and determined that the interchange would not be closer to the commenter's property. Project construction near the property will occur within the existing right-of-way of SR 120.

A-2: Section 2.2.3 Noise [and Vibration] pg. 100, and Chapter 3 Noise pg. 189 in the environmental document provide a construction noise analysis estimating that noise levels generated by project construction could reach up to 67.1 dBA L_{max} in the Bishop Street vicinity. This noise level is equivalent to the current ambient noise level in the Bishop Street vicinity; therefore, noise levels are not anticipated to increase in this area. Please refer to Table 2-20 on page 123 of the environmental document, which shows the existing ambient noise level north of Bishop Street in the condominium complex between E Atherton Drive and the SR 120 right-of-way.

A-3: Caltrans staff (Jennifer Lugo) provided the following response to the voice mail that she received:

"Thank you for your voicemail yesterday about your property located at 767 Bishop Street in Manteca. I checked the Draft Environmental Document (DED), and it looks like your property is not listed as being needed for temporary or permanent acquisition. You also asked about access to the neighborhood. The interchange at Main will be available to use during construction. These topics as well as construction impacts associated with the project are contained within the DED (ex: Chapter 1, Project Description and Project Alternatives, pages 2 and 9; Community Impacts, page 31; Traffic and Transportation, page 38). You had mentioned that there were issues with accessing the link to the DED. I pasted a few links below for you to try. It these do not work, let me know and we can send you an electronic version of the document. Please read through the document and send any comments you may to have to me via email or US mail by May 25, 2019. Your comments will be officially responded to in the project's Final Environmental Document."

http://www.dot.ca.gov/d10/project-docs/sanjoaquin/sr99120interchangeconnector/SR99-120_ED_MasterDocument_2019_26_9_Final_CLEAN.pdf

http://www.dot.ca.gov/d10/x-project-sr99120interchange.html

Comment Letter B: San Joaquin County Department of Public Works

Comment Letter B

SAN JOAQUIN COUNTY
Greatness grows here.

Public Works
Working for YOU

Department of Public Works

Kris Balaji, Director of Public Works

Fritz Buchman, *Deputy Director/Development*
Alex Chetley, *Interim Deputy Director/Engineering*
Jim Stone, *Deputy Director/Operations*
Kristi Rhea, *Manager of Strategic Initiatives*

May 20, 2019

Jennifer Lugo, Senior Environmental Planner
Department of Transportation, Dist 10
1976 Dr. Martin Luther King Jr BLVD
Stockton CA 95205

SUBJECT: NOA INITIAL STUDY AND NOI TO ADOPT A MND FOR THE STATE ROUTE 99/ STATE ROUTE 120 INTERCHANGE IMPROVEMENT PROJECT

Dear Jennifer Lugo,

The San Joaquin County Department of Public Works has reviewed the Initial Study and Proposed Mitigated Negative Declaration for the above project and has no comment at this time.

The County does request to be included on the circulation list for any additional project documents.

Thank you for the opportunity to review and comment. Should you have questions please contact me at lsears@sjgov.org or (209) 468-3085.

B-1

Sincerely,

Laurel Sears
Environmental Coordinator, Associate Planner

LS:jl c:Najee Zarif, Engineering Services Manager

Response to Comments: Letter B

San Joaquin County Public Works Department (May 20, 2019)

B-1: Caltrans and SJCOG appreciates your interest in this project and will keep you on the circulation list for any additional project documents.

Comment Letter C: Herum\Crabtree\Suntag Attorneys Letter

HERUM \ CRABTREE \ SUNTAG
ATTORNEYS

RECEIVED
MAY 22 2019
San Joaquin
Council of Governments

Comment Letter C

Steven A. Herum
sherum@herumcrabtree.com

May 20, 2019

Ms. Jennifer Lugo
Senior Environmental Planner
California Department of Transportation
855 M Street, Suite 200
Fresno, California 93721

Mr. David Ripperda
Associate Regional Planner
San Joaquin Council of Governments
555 E. Weber Avenue
Stockton, California 95202

Re: **State Route 99/State Route 120 Interchange Improvement Project**
City of Manteca, San Joaquin County, California
District 10-SJ-99/120 (PM 3.1/6.2 PM R5.1/T7.2)
EA 10-1E740 Project ID: 1016000038

Dear Ms. Lugo and Mr. Ripperda:

This office represents the Indelicato family who reside at 2170 South Austin Road, Manteca, California. The family has a vital interest in this project, which is designed to take by force a portion of their family homestead and could also deprive them of reasonable ingress and egress.

To start with, CEQA is to be expansively interpreted in order to provide maximum evaluation and consideration of potential direct and indirect environmental effects. Title 14 California Code of Regulation § 15003(f) [hereinafter CEQA Guideline]; *Friends of Mammoth v. Board of Supervisors* (1972) 8 Cal.3d 247,259. **In keeping with this expansive statutory mandate the "EIR requirement is the heart of CEQA."** CEQA Guideline § 15003(a) (bolding added); *County of Inyo v. Yorty* (1973) 32 Cal.App.3d 795.

C-1

In particular, under the Fair Argument standard an agency must prepare an EIR in instances where there is a fair argument that a project may cause a significant effect to the environment. The argument may be based upon substantial evidence or upon the agency's failure to proceed in a manner required by law when evaluating the potential significant environment effects in an initial study. *Quail Botanical Gardens Foundation, Inc. v. City of Encinitas* (1994) 29 Cal.App.4th 1597; *Sundstrom v. County Mendocino* (1988) 202 Cal.app.3d 296, 309. Here, with respect to several potentially

significant environmental effects, the agency did not proceed in a manner required by law when evaluating the impacts and this failure results in the need to prepare an environmental impact report.

C-1 Con.

More specifically, a CEQA compliance document must consider both direct and indirect environmental effects (CEQA Guideline § 15064(e)) including secondary environmental effects resulting from direct economic effects. The expansive interpretation of this rule was presented in *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1205-1206 and illustrates the meaningful relationship between socio-economic direct effects to secondary or indirect environmental effects:

> Guidelines section 15131, subdivision (a) provides, "An EIR may trace a chain of cause and effect from a proposed decision on a project through anticipated economic or social changes resulting from the project to physical changes in turn caused by the economic or social changes. The intermediate economic or social changes need not be analyzed in any detail greater than necessary to trace the chain of cause and effect. The focus of the analysis shall be on the physical changes."
>
> Case law already has established that in appropriate circumstances CEQA requires urban decay or deterioration to be considered as an indirect environmental effect of a proposed project. The relevant line of authority begins with *Citizens Assn. for Sensible Development of Bishop Area v. County of Inyo* (1985) 172 Cal.App.3d 151, 217 Cal.Rptr. 893 (*Bishop*). There, the appellate court held that adoption of multiple negative declarations for different aspects of the same large regional shopping center violated CEQA. (*Id.* at p. 167, 217 Cal.Rptr. 893.) The court also agreed with appellant that on remand "the lead agency must consider whether the proposed shopping center will take business away from the downtown shopping area and thereby cause business closures and eventual physical deterioration of downtown Bishop." (*Id.* at p. 169, 217 Cal.Rptr. 893.) Citing Guidelines section 15064, the court found that the lead agency had an affirmative duty to consider whether the new shopping center would start an economic chain reaction that would lead to physical deterioration of the downtown area. (*Id.* at p. 170, 217 Cal.Rptr. 893.) Therefore, "[o]n remand the lead agency should consider physical deterioration of the downtown area to the extent that potential is demonstrated to be an indirect environmental effect of the proposed shopping center." (*Id.* at p. 171, 217 Cal.Rptr. 893.)

C-2

Accordingly, in *Bakersfield Citizens* the socio-economic impact of store closures required the two EIRs to study in depth the potential that this non-environmental effect could start a "chain of events" leading to urban decay, a recognized environmental effect.

C-2 Con.

We are surprised that the agency dispensed with preparing an environmental impact report for a project of this size and magnitude. A strong presumption in favor of preparing EIRs is built into CEQA. *Friends of 'B' Street v. City of Hayward* (1980) 106 Cal.app.3d 988, 1002. The standard for requiring an EIR sets a "low threshold" for preparing an EIR rather than proceeding with a negative declaration. *Pocket Protectors v. City of Sacramento* (2004) 124 Cal.App.4th 252. Here substantial relevant information and reasonable inferences exists to require preparation of an EIR. In addition, there are important points in the Initial Study/Negative Declaration process where the agency failed to proceed in a manner required by law in evaluating potentially significant environmental effects, and this failure creates a separate and independent basis for requiring an EIR in this instance.

C-3

The DEIR Did Not Correlate the Project's Adverse Air Quality Impacts to Resultant Adverse Health Effects.

Failing to correlate the Project's adverse air quality impacts to increased incidents of health ailments constitutes a prejudicial abuse of discretion. Health problems caused by a project must be addressed in the CEQA compliance document, including health effects caused by increases in air pollution. *Bakersfield* at 1220. Specifically, CEQA requires a CEQA compliance document to discuss "health and safety problems caused by the physical changes" by the proposal. §15126.2(a). In order to meet CEQA's disclosure requirement, the document must "*correlate* the identified adverse air quality impacts to resultant adverse health effects." *Bakersfield* at 1219 (italics added). "Correlate" is defined as: "to bring (a thing) into mutual relation (*with* another thing); **calculate** or show the reciprocal relation between; specif., to bring (one or two related or interdependent **quantities**, sets of statistics, etc.) into contrast (*with* the other)." Webster's New World Dictionary 319 (2d College ed. 1985) (italics in original; bold added).

C-4

Thus, the court in *Bakersfield* used "correlate" to mean an EIR must disclose the proportional relationship between increased tonnages in air pollution and increased incidents of health ailments. The DEIR fails to comply with this necessary informational disclosure requirement. Indeed, *Bakersfield* teaches us a truncated analysis involving a bare statement that increased air pollution tonnages means more people get ill fails to satisfy CEQA's information disclosure requirement. In *Bakersfield*, the two EIRs at issue calculated the approximate increased tonnage of air pollution and then baldly concluded that more air pollution means more health and respiratory ailments. *Id.* at 1220. According to *Bakersfield*, this embryonic level of detail is insufficient and resulted in the Appellate Court rejecting the air quality analyses for failing to quantify or correlate the relationship between increased health ailments and increased air

pollution. *Id.* at 1220-1221. Accordingly, it is not enough for an EIR to simplistically conclude air pollution will increase and then supply a laundry list of pollutants and related health effects. Rather, CEQA is satisfied only when an EIR discloses and quantifies anticipated increases of health ailment events resulting from a project's increases in air pollution tonnages.

The CEQA document prepared in this instance essentially suffers the same affliction as the *Bakersfield* EIRs and likewise fails to satisfy CEQA. The document fails to disclose the Project will increase the total tonnage of air pollution in the region and fails to offer an estimate of the increase in "Criteria Air Pollutants and Precursors from Project Operations", including reactive organic gases, nitrogen oxides, and particulate matter. **The analysis deliberately omitted any quantification of the amount of ROG, Nox, or particulate matter**. This produces a significant omission of relevant information in the form of the amount air pollution emitted by the Project and the projected number of air pollution related health problems. The truncated analysis prevents the public and decision makers from understanding the health risks associated with this project.

C-4
Con.

Indeed, the analysis is cut off artificially at this point, however, and fails to quantify the increases in "known adverse health effects" produced by the Project's "significant and unavoidable" increase in air pollutants. By stopping short, the CEQA compliance document prevents the public from having a reasonable idea how much worse our health will be if the Project is constructed and operates.

Furthermore, it does not disclose the magnitude of public health effects resulting from the anticipated increase in ozone and particulate matter generated by the Project. This simply does not provide the public and decision makers with relevant information essential to determining the exacerbated health consequences caused by a significant and unavoidable increase in pollutants in the San Joaquin Valley nonattainment air basin.

In order to foster this critical review, we append as Attachment 1 copies of the deficient air quality analyses from the *Bakersfield* EIRs and explained that this CEQA compliance document does less than the disapproved *Bakersfield* approach to studying and disclosing respiratory health effects. We also append as Attachment 2 qualified medical journal studies demonstrating the scientific and technical capabilities of studying the causal link between increased tonnages of air pollution caused by new development and increased incidents of air pollution caused illnesses. Yet this CEQA compliance document contains a dearth of information explaining why information correlating increases in air pollution to anticipated increases in cardiovascular disease was omitted. ["The EIR does not explain in even minimum detail the basis for the omission and provides no reasoned analysis clarifying why complete reliance on the AQNP is justified when this major omission exists." *Citizens to Preserve the Ojai* at 430.] Indeed, *Ojai* teaches us that this DEIR is deficient unless it expressed reasons for omitting a study correlating the adverse air quality impacts to resultant adverse health effects. But alas, the only evidence is the multiple scientific studies we introduced illustrating that the requisite correlation of effect and harm is both feasible and practical.

The CEQA compliance document's air quality analysis ignores glaring omissions and falls short of fulfilling the disclosure requirement. This truncated analysis violates CEQA by omitting a correlation between adverse air quality impacts and resultant adverse health effects and does not disclose the severity of the Project's environmental impacts. As *Bakersfield* holds, brief references to, or the listing of, potential respiratory illnesses do not satisfy CEQA. *Bakersfield* at 1220. It is only when correct and feasible scientific analysis is conducted and the EIR calculates the significance of the impact in terms of increased events of disease and suffering, are the public and decision makers notified of a project's true impacts. This correlation information is scientifically possible and legally required (*Bakersfield* at 1220), and the omission amounts to a prejudicial failure to proceed in the manner required by law.

C-4 Con.

Finally, we observe that the principles and process enunciated in *Bakersfield* was recently endorsed by the state Supreme Court in *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502.

The DEIR Failed to Satisfy Appendix F of the CEQA Guidelines.

The CEQA compliance document's actual disclosures fail to comply with CEQA's "Appendix F" energy disclosure and mitigation standards. Public agencies are directed to evaluate, disclose, and mitigate a project's energy implications in their environmental analyses, and the "[f]ailure to include a detailed statement setting forth mitigation measures proposed to reduce wasteful energy consumption as required by Pub. Res. C. §21100 (b)(3) may render an EIR legally inadequate." *CEB CEQA Treatise*, §14.14 at 711. "In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy." Guidelines Appendix F(I)(underline added) (see §15126.4).

C-5

Appendix F implements this CEQA mandate by instructing public agencies that "[p]otentially significant energy implications of a project should be considered in an EIR," and describing several energy-related issues to be evaluated such as energy efficiency, effects to energy supplies, effects on peak and base period demands, compliance with existing energy standards, and transportation energy consumption. *Id.* at (II)(C). Appendix F explains that compliance starts with the EIR's project description. To produce a legally sufficient analysis, the Guidelines direct an EIR's project description to include a discussion of:

- energy consuming equipment to be used by the project (App. F II.A.1.);
- energy requirements of the project by fuel type (App. F II.A.2.);
- energy conservation equipment (App. F II.A.3.);
- energy costs (App F. II.A.4.); and
- energy consumption per vehicle trip (App F. II.A.5.).

Likewise, Appendix F suggests an EIR's "environmental setting" section "include existing energy supplies and energy use patterns in the region and locality." *Id.*

The CEQA compliance document omits any discussion of energy consuming equipment to be used by the Project, energy requirements of the Project by fuel type, energy conservation equipment, energy costs, or energy consumption per vehicle trip in the "Project Description" section as required by the Guidelines. This failure to proceed in a manner required by law makes it impossible for the public to determine whether energy impacts have been adequately addressed or whether a full EIR is required. Further, the environmental setting fails to disclose existing energy supply and use patterns in Manteca or the surrounding region.

C-5 Con.

In short, the CEQA compliance document's analysis is limited to a series of evidence-starved conclusions offering no analysis or information produced by following Appendix F's procedure. This failure to proceed in a manner required by law is fatal to the Negative Declaration's legal sufficiency.

When evaluating an agency's failure to meaningfully consider a potential impact due to omitted relevant information, "[t]he relevant question is whether the lead agency failed to proceed in the manner required by law." *Bakersfield* at 1208. Here, the CEQA compliance document's abject failure to adequately describe and mitigate the Project's energy impacts in compliance with Appendix F prejudices the decision-making process. It unlawfully dispensed with the energy evaluation and mitigation measures of Public Resources Code §21100, Guidelines §15126.5, and Appendix F. In addition, in light of California's ongoing energy supply crisis, which has resulted in inflated fuel prices, skyrocketing heating and air-conditioning bills, and regular summertime threats of "rolling blackouts", it is critical that the CEQA compliance document contain all necessary information relating to the Project's energy consumption. After reviewing the Initial Study/Negative Declaration, neither the public nor the decision makers know the extent to which the *entire* Project consumes energy, whether such consumption is inefficient and wasteful, and whether the impacts can be reduced or mitigated to less-than-significant levels.

The DEIR's Evaluation of the Project's Direct and Indirect Impact to Global Warming is Legally Deficient.

Public agencies are encouraged to adopt thresholds of significance. CEQA Guideline § 15064.7. For evaluating individual projects the State of California and regional state agencies offered multiple thresholds of significance for global warming. For instance, the South Coast Air District believes a project emitting three tons of GHG a year is significant. South Coast Air Quality Management District, "Draft Guidance Document—Interim CEQA Greenhouse Gas (GHG) Significance Threshold (October 2008). AB 32 establishes a state goal of reducing GHG emissions to 1990 levels by 2020 (a reduction of approximately 25 percent from forecast emission levels).

C-6

Recently the State Air Resources Board concluded that the threshold should either be a zero threshold or, if a non-zero threshold is employed it "must be sufficiently stringent to make substantial contributions to reducing the State's GHG emission peak, to causing that peak to occur sooner or to putting California on the right track to meet its interim (2020) and long term (2050) emissions reduction targets." California Air Resources Board. Preliminary Draft Staff Proposal, Recommended Approaches for Setting Interim Significant Thresholds for Greenhouse Gases under the California Environmental Quality Act (October 24, 2008). In any event, the threshold is either a net no increase in emitting GHG or "stringent" steps to foster attaining the 2020 and 2050 goals.

Most importantly, since the CPR identifies itself as "acting in the capacity of a state agency", it is bound by Executive Order Number 3-05 (June 1, 2005) calling for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions to 1990 levels by 2050. This Executive Order constitutes a mandatory duty to all state agencies and constitutes a threshold of significance whenever a state agency is reviewing a proposal.

C-6
Con.

At least two fatal flaws are embedded in the CEQA compliance document. First, there is a lack of an understandable threshold of significance. Hence, the reader is unable to determine whether the impact is significant or not. Instead the CEQA compliance document, without any evidentiary support, concludes that the project will not cause a significant climate change impact. Yet the various thresholds of significance discussed earlier, and ignored by the CEQA compliance document, do not focus on this question. Instead, the thresholds of significance focus on whether the proposal helps or hurts efforts to meet the 2020 and 2050 goals. Without a threshold of significance statement the entire analysis lacks an intellectual context and results in omitting relevant information.

Indeed, the sketchy treatment of the threshold or method to conclude whether an environmental effect is significant renders such an EIR legally deficient. In *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th 1099. The court discussed the use of thresholds in determining (1) whether to prepare an EIR and (2) whether any of the possible significant environmental effects of the project will, in fact, be significant. *Id.* at 1106-09. The court held that "the fact that a particular environmental effect meets a particular threshold cannot be used as an automatic determinant that the effect is or is not significant...a threshold of significance cannot be applied in a way that would foreclose the consideration of other substantial evidence tending to show the environmental effect to which the threshold relates might be significant." *Id.* at 1109.

In the EIR, the Amador Water Agency set forth various standards of significance, which mirrored Appendix G sample questions. The agency determined that the reduced stream flows "are insignificant since the thresholds developed from the standardized Appendix G checklist make it so." *Id.* at 1111. Petitioner asserted the agency abused its discretion by adopting narrow and irrelevant thresholds of

significance which did not address the particular physical change the project would have on the seasonal reduction of surface flow in local streams.

The court did not even address petitioner's claim because "contrary to CEQA requirements, the EIR fails to explain the reasons *why* the Agency found the reduction in stream flow would not be significant." *Id.* at 1111. The court held that the EIR provided nothing but a "bare conclusion" because it simply explained how construction would affect existing local hydrology by reducing surface flow and then baldly concluded the impact would not be significant. *Id.* Since the EIR lacked a "statement of reasons", the court was unable to determine whether the agency reached its "less than significant" conclusion based on substantial evidence in the record or because it applied standards of significance that did not address reduction in stream flow as a potential environmental effect of the project. *Id.* at 1112. Either way, the agency abused its discretion by omitting the required statement of reasons. *Id.*

Second, the section does not provide information about the amount of GHG produced by the Project and whether the amount emitted facilitates meeting the 2020 and 2050 goals. Rather than contribute to reducing GHG emissions to 1990 standard this project has the individual characteristic of making the GHG situation substantially worse.

C-6 Con.

Accordingly, under any of the proposed and adopted thresholds of significance discussed earlier, the Project's individual impact on GHG is significant. The CEQA compliance document omits relevant information and data and reaches the wrong conclusion about whether the impact is significant or not.

Moreover, the CEQA compliance document failed to discuss the feasibility of multiple mitigation measures that could be imposed to reduce this significant effect. CEQA requires all feasible mitigation measures to be incorporated into a project, even if the environmental effect remains significant. The State of California, Office of the Governor, Office of Planning and Research, has identified thirty three feasible mitigation measures to reduce GHG and attain the 2020 and 2050 goals. See State of California, Office of Planning & Research. "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review (June 19, 2008) at Attachment 3. Each mitigation measure is feasible for the proposal and the DEIR has a duty to identify and discuss each proposed measure. Failing to perform this task results in an omission of information and failure to proceed in a manner required by law.

GROWTH INDUCING IMPACTS

C-7

The CEQA compliance document summarily dismisses growth inducing impacts by stating without evidence that the project is intended to accommodate existing growth planned by the City of Manteca. This unsupported argument is flawed for several reasons.

First, growth occurs in areas other than the incorporation boundaries of Manteca. This interchange will be used by residents of the County and the City of Ripon. The statement implies that the growth anticipated in these areas are not addressed in the project. Second, the statement fails to disclose that the City of Manteca is presently updating its General Plan and adding substantial residential areas that are not identified in the current General Plan. Thus the statement is objectively false in that the density, amount and pattern of residential growth in Manteca will change once the new General Plan is adopted. Third, infrastructure improvements such as new roadways and sewer extension are inherently growth inducing. This project squarely fits the definition of growth inducing. See CEQA Guideline section 15126.2(g).

Finally growth inducing impacts carry a very low threshold of significance to require a full environment impact report. *Stanislaus Audubon Soc'y v. County of Stanislaus* (1993) 33 Cal.App.4th 144. 150. Historically significant freeway or road improvements have resulted in growth inducement that must be studied as part of an EIR. Thus a golf course proposal (see *Stanislaus Audubon*) or freeway improvements (see *City of Carmel-by-the-Sea v. U.S. Dep't of Transportation* (9th Cir.) 123 R.3d 1142, 1165) require an analysis of the growth inducing impacts caused by the proposals.

C-7 Con.

Based on personal observation, public improvements such as improving and enlarging street widths or adding freeway interchanges contribute to growth inducing impacts. At a bare minimum the freeway interchange creates attractive corners for highway commercial uses or office buildings that otherwise would not have been constructed at the location. Omitting consideration of the new Manteca General plan in combination with omitting an analysis of the new County General Plan and the Ripon General Plan contradicts the naked assertion that the improvement only address planned growth in Manteca.

TRAFFIC IMPACTS

The report concludes that traffic congestion is acceptable. Yet at build out the evening LOS at Moffit/Austin is LOS D, at Yosemite and Austin is LOS E, at Westbound SR 120 Ramps/Main is LOS F and at Eastbound SR 120 Ramps/Main Street is LOS F. Report at page 71. These LOS levels are not insignificant or acceptable nor do they conform to acceptable thresholds of significance. It does not make logical sense that the failure of a freeway intersection would not trigger a finding of significance and therefore require an EIR.

C-8

Very truly yours,

STEVEN A. HERUM
Attorney-at-Law

SAH:lac

Attachment 1

Gosford Village

Final Environmental Impact Report

SCH# 2002051156



Prepared for:

City of Bakersfield

Prepared by:

Jones & Stokes

December 2002

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Chapter 3B

Air Quality

Introduction

This section describes the setting and potential air quality impacts of the proposed land development project known as Gosford Village, located in the western part of the City of Bakersfield. Specifically, it focuses on the relationship between topography and climate, discusses federal and state ambient air quality standards and existing air quality conditions in the proposed project area, describes the overall regulatory framework for air quality management in California and the region, and identifies sensitive receptors in the proposed project area. This section then identifies the potential air quality impacts of the proposed project and proposes mitigation measures to reduce any significant impacts to less-than-significant levels. This analysis is primarily based on the Air Quality Impact Study prepared for the project by WZI Inc. (2002) (Appendix C).

Environmental Setting

Regional Climate and Meteorology

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The proposed project site is located in Kern County, and lies within the San Joaquin Valley Air Basin (SJVAB). The SJVAB includes a portion of Kern County and all of San Joaquin, Stanislaus, Merced, Madera, Fresno, Kings, and Tulare Counties. The San Joaquin Valley Unified Air Pollution Control District (SJVUAPCD) has jurisdiction over air quality issues throughout the 8-county San Joaquin Valley Air Basin. It administers air quality regulations developed at the federal, state, and local levels. Federal, state, and local air quality regulations applicable to the proposed project are described below.

The SJVAB, which is approximately 250 miles long and averages 35 miles wide, is the second largest air basin in the state. The SJVAB is defined by the Sierra Nevada mountains in the east (8,000–14,000 feet in elevation), the Coast Ranges in the west (averaging 3,000 feet in elevation), and the Tehachapi Mountains in the south (6,000–8,000 feet in elevation). The topography of the air basin includes foothills and mountain ranges to the east, west and south, and a relatively flat valley floor with a slight downward gradient to the northwest. The topography of the project area is flat at an elevation of approximately 365 feet above mean sea level as shown on the U. S. Geological Survey topographical

map, Gosford, California, Quadrangle. The valley opens to the sea at the Carquinez Straits where the San Joaquin-Sacramento Delta empties into San Francisco Bay. The San Joaquin Valley (SJV), thus, could be considered a "bowl" open only to the north.

The SJVAB has an "inland Mediterranean" climate averaging over 260 sunny days per year. The valley floor experiences warm, dry summers and cool, wet, winters. Summer high temperatures often exceed 100°F, averaging in the low 90s in the northern valley and high 90s in the south. In the entire SJV, high daily temperature readings in summer average 95°F. Over the last 30 years, the SJV averaged 106 days a year at 90°F or hotter, and 40 days a year at 100°F or hotter. The daily summer temperature variation can be as high as 30°F.

In winter, as the cyclonic storm track moves southward, the storm systems moving in from the Pacific Ocean bring a maritime influence to the SJV. The high mountains to the east prevent the cold, continental air masses of the interior from influencing the valley. Winters are mild and humid. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50s, but highs in the 30s and 40s can occur on days with persistent fog and low cloudiness. The average daily low temperature is 45°F.

Although marine air generally flows into the basin from the San Joaquin River Delta, the region's topographic features restrict air movement through and out of the basin. The Coastal Range hinders wind access into the SJV from the west, the Tehachapis prevent southerly passage of airflow, and the high Sierra Nevada range is a significant barrier to the east. These topographic features result in weak airflow, which becomes blocked vertically by high barometric pressure over the SJV. 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).

Criteria Pollutants and Local Air Quality

Description of Pollutants

The federal and state governments have established ambient air quality standards for six criteria pollutants: ozone, carbon dioxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than 10 microns in diameter (PM_{10}), and lead. Ozone and PM_{10} are generally considered to be "regional" pollutants, as these pollutants or their precursors affect air quality on a regional scale. Pollutants such as CO, NO_2, SO_2, and lead are considered to be local pollutants that tend to accumulate in the air locally. PM_{10} is considered to be a localized pollutant as well as a regional pollutant. In the area where the proposed project is located, PM_{10} and ozone are of particular concern.

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Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and can cause substantial damage to vegetation and other materials. Ozone is a severe eye, nose, and throat irritant. Ozone also attacks synthetic rubber, textiles, plants, and other materials. Ozone causes extensive damage to plants by leaf discoloration and cell damage.

Ozone is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Ozone precursors, which include reactive organic gases (ROG) and oxides of nitrogen (NO_x), react in the atmosphere in the presence of sunlight to form ozone. Because photochemical reaction rates depend on the intensity of ultraviolet light and air temperature, ozone is primarily a summer air pollution problem. The ozone precursors, ROG and NOx, are emitted by mobile sources and by stationary combustion equipment.

State and federal standards for ozone have been set for a 1-hour averaging time. The state 1-hour ozone standard is 0.09 parts per million (ppm), not to be exceeded. The federal 1-hour ozone standard is 0.12 ppm, not to be exceeded more than three times in any 3-year period.

The Bakersfield California Avenue monitoring station has recorded 131 exceedances of the state ozone standard and two exceedances of the federal ozone standard during the three most recent years for which data are available (1998-2000) (Table 3B-1).

Carbon Monoxide

CO is essentially inert to plants and materials but can have significant effects on human health. CO is a public health concern because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans range from slight headaches to nausea to death.

Motor vehicles are the dominant source of CO emissions in most areas. High CO levels develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures.

State and federal CO standards have been set for both 1-hour and 8-hour averaging times. The state 1-hour standard is 20 ppm by volume, and the federal 1-hour standard is 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period.

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The Bakersfield California Avenue monitoring station has recorded no exceedances of the state or federal CO standard during the three most recent years for which data are available (1998-2000) (Table 3B-1).

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PM_{10}

Health concerns associated with suspended particulate matter focus on those particles small enough to reach the lungs when inhaled. Particulates can damage human health and retard plant growth. Particulates also reduce visibility, and soil buildings and other materials, and corrode materials.

PM_{10} emissions are generated by a wide variety of sources including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by reactions in the atmosphere.

The state PM_{10} standards are 50 micrograms per cubic meter as a 24-hour average and 20 micrograms per cubic meter as an annual geometric mean. The federal PM_{10} standards are 150 micrograms per cubic meter as a 24-hour average and 50 micrograms per cubic meter as an annual arithmetic mean.

The Bakersfield California Avenue monitoring station has recorded 324 exceedances of the state PM_{10} standard and nine exceedances of the federal PM_{10} standard during the three most recent years for which data are available (1998-2000) (Table 3B-1).

Existing Air Quality Conditions

The existing air quality conditions in the proposed project area can be characterized by monitoring data collected in the region. PM_{10}, CO, and ozone concentrations are measured at several north bay monitoring stations. These are the pollutants of greatest concentration within the SJVUAPCD and are the pollutants of most concern from the proposed project. Air quality monitoring data for the last three years are presented in Table 3B-1. The closest monitoring station is located at the California Avenue monitoring station in the City of Bakersfield.

Areas such as the San Joaquin Valley are classified as either *attainment* or *non-attainment* with respect to state and federal ambient air quality standards. These classifications are determined by comparing actual monitored air pollutant concentrations to state and federal standards. The pollutants of greatest concern in this valley are ozone and inhalable particulate matter. As seen from Table 3B-1, the project area has experienced violations of the state and federal ozone standards and state PM_{10} standards during the last three years. Table 3B-1 also indicates that the federal and state CO standards have not been exceeded.

The State of California has designated the SJVUAPCD as being in severe non-attainment for ozone and in non-attainment for PM_{10}. The SJVUAPCD has adopted an air quality improvement plan that addresses NO_x and ROGs, both of which are ozone precursors and contribute to PM_{10}. The plan specifies that regional air quality standards for ozone and PM_{10} concentrations can be met through the use of additional source controls and trip reduction strategies. It also establishes emissions budgets for transportation and stationary sources. Those

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Table 3B-1. Ambient Air Quality Monitoring Data from Bakersfield- California Avenue Monitoring Station

Pollutant Standards	1999	2000	2001
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.116	0.125	0.129
No. Days Standard Exceeded			
CAAQS (1-hour) > 0.09 ppm	44	41	46
NAAQS (1-hour) >.0.12 ppm	0	1	1
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	4.51	4.89	3.41
Maximum 1-hour concentration (ppm)	5.8	6.9	5.8
No. Days Standard Exceeded			
CAAQS (8-hour) ≥ 9.0 ppm	0	0	0
NAAQS (8-hour) ≥ 9.0 ppm	0	0	0
CAAQS (1-hour) ≥ 20 ppm	0	0	0
NAAQS (1-hour) ≥ 35 ppm	0	0	0
Particulate Matter (PM10)			
Maximum 24-hour concentration ($\mu g/m^3$)	143.0	140.0	190.0
2nd Highest 24-hour concentration ($\mu g/m^3$)	138.0	133.0	186.0
Average geometric mean concentration ($\mu g/m^3$)	40	39	43
Average arithmetic mean concentration ($\mu g/m^3$)	47	45	47
No. Days Standard Exceeded*			
CAAQS (24-hour) > 50 $\mu g/m^3$	108	102	114
NAAQS (24-hour) > 150 $\mu g/m^3$	0	0	9

* Calculated exceedances based on measurements taken every six days.

Source: California Air Resources Board 2002 and Environmental Protection Agency 2002

budgets, developed through air quality modeling, reveal how much air pollution can occur in an area before national ambient air quality standards are violated.

The EPA has designated the SJVUAPCD as being in severe non-attainment for ozone and in serious non-attainment for PM_{10}. The San Joaquin Valley Air Basin did not attain the federal 1-hour ozone standards by November 1999; as a result, EPA redesignated the San Joaquin Valley Air Basin as a *severe* ozone non-attainment area. Under the *serious* designation, the SJVUAPCD had until November 1999 to reach the federal 1-hour ozone standards. The redesignation as a *severe* non-attainment area gives the SJVUAPCD more time (until 2005) to conform to the health-based standards. However, the redesignation also will require that more stringent and expensive control measures be imposed on industry and will bring thousands of businesses under EPA Title I requirements. If the SJVUAPCD fails to attain the standards by 2005, sanctions and a *de facto* growth moratorium could be imposed in the air basin.

Under the severe designation, transportation control measures are no longer voluntary. Reasonably available transportation control measures must be implemented unless a demonstration can be made that a measure is either financially or technologically infeasible, or would not contribute to attainment, or does not apply to a local area. Non-attainment has already forced local transportation control measures, air district controls on industrial emissions and enhanced vehicle emissions testing. Prolonged non-attainment could also result in the implementation of federal controls on interstate truck, train, and plane travel, as well as additional controls on stationary and mobile sources (Stanislaus Council of Governments [StanCOG] 2001a).

The EPA has mandated that the SJVUAPCD submit a Severe Area Ozone Plan by May 31, 2002 (StanCOG 2001a). In addition, the SJVUAPCD must adopt and implement by November 15, 2002, the six measures committed to in the federally approved State Implementation Plan (SIP), or revise its SIP. Failure to address the nonimplementation finding within this deadline will trigger the Clean Air Act sanctions 18 months after the effective date of the October 23, 2001 action. The Valley Regional Transportation Planning Agencies (RTPAs) are already in the process of evaluating transportation control measures for the SIP development process in response to the severe nonattainment status. At present, applicable SIPs submitted to and approved by EPA include ozone (under a serious classification) and CO (a maintenance plan). Approved motor vehicle emission budgets for volatile organic compounds (VOCs), NO_X, and CO are in place. The EPA has found the submitted PM_{10} plan budgets to be inadequate (which included PM_{10}, VOC, and NO_X) (StanCOG 2001b).

Sensitive Land Uses

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Sensitive land uses are generally defined as locations where people reside or where the presence of air emissions could adversely affect the use of the land. Typical sensitive receptors include residents, school children, hospital patients, the elderly, etc.

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Sensitive land uses in the vicinity of the project area include:

- the "Campus Park" single-family residential subdivision located north of the project site across Pacheco Road and adjacent to the Southern Pacific Railroad (SPRR) tracks;
- the "Silver Creek" single-family residential subdivision located east of the project site across Gosford Road;
- Reimer's Garden Center plant nursery located east of the project site at the southeast corner of Gosford Road and Pacheco Road; and
- Sing Lum School, which is located west on 4600 Chaney Lane, approximately 0.25-mile from the project site.

Applicable Regulations

Both the State of California and the federal government have established ambient air quality standards for several different pollutants. For some pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). The pollutants of greatest concern in the Bakersfield area are CO, ozone, and PM_{10}. Table 3B-2 shows the state and federal standards for a variety of pollutants.

Federal Regulations

Federal Clean Air Act

The federal Clean Air Act, promulgated in 1970 and amended twice thereafter (including the 1990 amendment), establishes the framework for modern air pollution control. The Act directs the EPA to establish ambient air standards for six pollutants: ozone, carbon monoxide, lead, nitrogen dioxide, particulate matter, and sulphur dioxide. The standards are divided into primary and secondary standards; the former are set to protect human health within an adequate margin of safety and the latter to protect environmental values, such as plant and animal life.

The primary legislation that governs federal air quality regulations is the Clean Air Act Amendments of 1990 (CAAA). The CAAA delegates primary responsibility for clean air to the EPA. The EPA develops rules and regulations to preserve and improve air quality, as well as delegating specific responsibilities to state and local agencies.

The EPA has established National Ambient Air Quality Standards for criteria pollutants (Table 3B-2). Criteria pollutants include CO, NO_2, SO_2, ozone, PM_{10}, and lead.

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Table 3B-2. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Concentration	
		State Standards	Federal Standards
Ozone	8 hours	NA[a]	0.08 ppm
	1 hour	0.09 ppm (180 $\mu g/m^3$)	0.12 ppm (235$\mu g/m^3$)
Carbon Monoxide	8 hours	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
	1 hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
Nitrogen Dioxide	Annual average	NA[a]	0.053 ppm (100 $\mu g/m^3$)
	1 hour	0.25 ppm (470 $\mu g/m^3$)	NA[a]
Sulfur Dioxide	Annual average	NA[a]	80 $\mu g/m^3$ (0.03 ppm)
	24 hours	0.04 ppm (105 $\mu g/m^3$)	365 $\mu g/m^3$ (0.14 ppm)
	1 hour	0.25 ppm (655 $\mu g/m^3$)	NA[a]
Particulate Matter (PM_{10})	Annual arithmetic mean	NA[a]	50 $\mu g/m^3$
	Annual geometric mean	20 $\mu g/m^3$	NA[a]
	24 hours	50 $\mu g/m^3$	150 $\mu g/m^3$
Particulate Matter – Fine ($PM_{2.5}$)	Annual arithmetic mean	NA[a]	12 $\mu g/m^3$
	24 hours	NA[a]	65 $\mu g/m^3$
Sulfates	24 hours	25 $\mu g/m^3$	NA[a]
Lead	Calendar quarter	NA[a]	1.5 $\mu g/m^3$
	30 days	1.5 $\mu g/m^3$	NA[a]
Hydrogen Sulfide	1 hour	0.03 ppm (2 $\mu g/m^3$)	NA[a]
Vinyl Chloride (chloroethene)	24 hours	0.010 ppm (26 $\mu g/m^3$)	NA[a]
Visibility Reducing Particles (VRP)	8 hours (10 a.m.–6 p.m. PST)	Particles in sufficient amount to produce an extinction coefficient of 0.23 per kilometer when the relative humidity is less than 70%.[b]	NA[a]

Notes: ppm = parts per million
mg/m^3 = milligrams per cubic meter
$\mu g/m^3$ = micrograms per cubic meter
PST = Pacific Standard Time

[a] No standard implemented.

[b] Statewide VRP Standard applies statewide except in Lake Tahoe Air Basin. This standard is intended to limit the frequency and severity of visibility impairment due to regional haze and is equivalent to a 10-mile nominal visual range.

Source: WZI Inc. 2002

If an area does not meet the federal NAAQS shown in Table 3B-2 are called "nonattainment" areas. For these nonattainment areas, the federal Clean Air Act requires states to develop and adopt SIPs, which are air quality plans showing how air quality standards will be attained. The SIP, which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. In cases where the SIP is submitted by the State but fails to demonstrate achievement of the standards, the EPA is directed to prepare a Federal Implementation Plan. In California, the EPA has delegated authority to prepare SIPs to the California Air Resources Board (ARB), which, in turn, has delegated that authority to individual air districts.

State Regulations

California Clean Air Act

Responsibility for achieving California's standards, which are more stringent than federal standards, is placed on the ARB and local air pollution control districts, and is to be achieved through district-level air quality management plans that will be incorporated into the SIP. In California, the EPA has delegated authority to prepare SIPs to the ARB, which, in turn, has delegated that authority to individual air districts

The ARB has traditionally established state air quality standards, maintaining oversight authority in air quality planning, developing programs for reducing emissions from motor vehicles, developing air emission inventories, collecting air quality and meteorological data, and approving state implementation plans.

Responsibilities of air districts include overseeing stationary source emissions, approving permits, maintaining emissions inventories, maintaining air quality stations, overseeing agricultural burning permits, and reviewing air quality–related sections of environmental documents required by CEQA.

The California CAA of 1988 substantially added to the authority and responsibilities of air districts. The California CAA designates air districts as lead air quality planning agencies, requires air districts to prepare air quality plans, and grants air districts authority to implement transportation control measures. The California CAA focuses on attainment of the state ambient air quality standards, which, for certain pollutants and averaging periods, are more stringent than the comparable federal standards.

The California CAA requires designation of attainment and nonattainment areas with respect to state ambient air quality standards. The California CAA also requires that local and regional air districts expeditiously adopt and prepare an air quality attainment plan if the district violates state air quality standards for CO, SO_2, NO_2, or ozone. These Clean Air Plans are specifically designed to attain these standards and must be designed to achieve an annual five percent reduction in districtwide emissions of each nonattainment pollutant or its precursors. No

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locally prepared attainment plans are required for areas that violate the state PM_{10} standards.

The California CAA requires that the state air quality standards be met as expeditiously as practicable but, unlike the federal CAA, does not set precise attainment deadlines. Instead, the act established increasingly stringent requirements for areas that will require more time to achieve the standards.

The California CAA emphasizes the control of "indirect and area-wide sources" of air pollutant emissions. The California Clean Air Act gives local air pollution control districts explicit authority to regulate indirect sources of air pollution and to establish traffic control measures (TCM). The California CAA does not define *indirect and area-wide sources*. However, Section 110 of the federal CAA defines an indirect source as

> "a facility, building, structure, installation, real property, road, or highway which attracts, or may attract, mobile sources of pollution. Such term includes parking lots, parking garages, and other facilities subject to any measure for management of parking supply...."

TCMs are defined in the California CAA as "any strategy to reduce trips, vehicle use, vehicle miles traveled, vehicle idling, or traffic congestion for the purpose of reducing vehicle emissions."

Recently enacted amendments to the California Clean Air act impose additional requirements designed to ensure an improvement in air quality within the next five years. More specifically, local districts with moderate air pollution that do not achieve "transitional nonattainment" status by December 31, 1997, must implement the more stringent measures applicable to districts with serious air pollution.

California Air Resources Board Diesel Exhaust Control Program

In August 1998, the ARB identified air particulate emissions from diesel-fueled engines (diesel PM) as toxic air contaminants based on their potential to cause cancer and other adverse health effects. The ARB then conducted a risk management evaluation to identify whether a need for further control of diesel PM was warranted (California Air Resources Board 2001).

The ARB developed the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles*, and *Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines*. The Board approved these documents on September 28, 2000, paving the way for the next step in the regulatory process: the control measure phase (California Air Resources Board 2001).

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During the control measure phase, specific statewide regulations designed to further reduce diesel PM emissions from diesel-fueled engines and vehicles are

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to be evaluated and developed. The goal of each regulation is to make diesel engines as clean as possible by establishing state-of-the-art technology requirements or emission standards to reduce diesel PM emissions. The regulations will be developed in an open and public process where availability, applicability, and cost of technology will all be evaluated. The interested members of the public, manufacturers, and other stakeholders will be asked to participate in the development of all proposed regulations (California Air Resources Board 2001).

Currently, the ARB is still in the process of developing Air Toxics Control Measures for diesel engines. A public hearing for the ARB's diesel emission control strategy verification procedure for on-road, off-road, and stationary diesel-fueled vehicles and equipment has been scheduled to take place in Sacramento, California. Some of the diesel control measures identified by the ARB that will be addressed at the public hearing include diesel oxidation catalysts, diesel particulate filters, fuel additives, alternative diesel fuels, and NO_X control strategies. A further discussion of these diesel control measures identified by the ARB is presented in Appendix D (California Air Resources Board 2002b). Please reference the final recommendation of the ARB evaluation prepared in August 1998.

Local Regulations

San Joaquin Valley Unified Air Pollution Control District

At the local level, the SJVUAPCD is responsible for establishing and enforcing local air quality rules and regulations that address the requirements of federal and state air quality laws. Air quality is also managed through land use and development planning practices. These practices are implemented in Kern County through the general planning process.

The District regulates air quality in the Bakersfield area. The predicted emissions associated with vehicular traffic (mobile sources) are not subject to the District's permit requirements. However, the District is responsible for overseeing efforts to improve air quality within the San Joaquin Valley. The District has prepared an Air Quality Attainment Plan to bring the San Joaquin Valley into compliance with the California Ambient Air Quality Standard for ozone. The District reviews land use changes to evaluate the potential impact on air quality.

San Joaquin Valley Air Pollution Control District Regulation VIII

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San Joaquin Valley Air Pollution Control District Regulation VIII specifies control measures for specified outdoor sources of fugitive particulate matter emissions. The District does not require a permit for these activities, but does impose measures to control fugitive dust, such as the application of water or a

chemical dust suppressant. The rules contained in Regulation VIII are listed below.

- Rule 8010 Fugitive dust administrative requirement for control of fine particulate matter.
- Rule 8020 Fugitive dust requirements for control of fine particulate matter from construction, demolition, excavation and extraction activities.
- Rule 8070 Fugitive dust requirements for control of fine particulate matter from vehicle and/or equipment parking, shipping, receiving, transfer, fueling and service areas one acre or larger.

In addition, the facility shall include the following as requirements of local zoning regulations.

- Water sprays or chemical suppressants must be used in all unpaved areas to control fugitive emissions.
- All access roads and parking areas must be covered with asphalt-concrete paving.

Compliance with District Regulation VIII and the local zoning code will reduce particulate emission impacts to levels that are considered "less than significant."

Impacts and Mitigation

Methodology

Construction Emissions

Construction will also result in exhaust emissions from diesel-powered heavy equipment. Exhaust emissions from construction include emissions associated with the transport of machinery and supplies to and from the site, emissions produced onsite as the equipment is used, and emissions from trucks transporting excavated materials from the site and fill soils to the site.

Emissions due to construction activities include CO, ROG, NO_X, SO_X, and PM_{10}. Emissions from construction activities were calculated using the URBEMIS 7G air quality model. Model inputs included five pieces of earthmoving equipment, two trucks, four miscellaneous mobile units, one fork-lift, seven construction workers commuting to the site, 30 days of grading, and a six-month construction period. The model output is available upon request at the City of Bakersfield Planning Department as part of the WZI Inc. report (WZI Inc 2002).

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Operational Emissions

Mobile Source Emissions

Vehicle emissions have been estimated for the year 2020 (expected completion date of this project) using the URBEMIS 7G computer model from the California Air Resources Board. This model predicts carbon monoxide, total hydrocarbons, nitrogen oxides, oxides of sulfur, and particulate matter emissions from motor vehicle traffic associated with new or modified land uses. The URBEMIS 7G modeling results are available upon request at the City of Bakersfield Planning Department as part of the WZI Inc. report (WZI Inc 2002).

Carbon monoxide emissions are a function of vehicle idling time and, thus, under normal meteorological conditions depend on traffic flow conditions. Carbon monoxide transport is extremely limited; it disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations close to a congested roadway or intersection may reach unhealthful levels, affecting sensitive receptors (residents, school children, hospital patients, the elderly, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable Level of Service (LOS). CO "Hot Spot" modeling is required if a traffic study reveals that the project will reduce the LOS on one or more streets to E or F; or, if the project will worsen an existing LOS F.

The impact of the proposed project on local carbon monoxide levels was assessed at these intersections with the Caltrans CALINE-4 Air Quality Model, which allows microscale CO concentrations to be estimated along each roadway corridor or near intersections. This model is designed to identify localized concentrations of carbon monoxide, often termed "hot spots." Year 2020 traffic data as predicted by the traffic study was used in the CALINE-4 model.

A traffic study was prepared by McIntosh & Associates for the Gosford Village project. The study indicates that nine intersections warrant a CO Hot Spot analysis:

- Gosford Road and Stockdale Highway,
- Gosford Road and Ming Avenue,
- Ashe Road and Ming Avenue,
- Ashe Road and White Lane,
- Stine Road and White Lane,
- Ashe Road and Harris Road,
- Gosford Road and Panama Lane,
- Ashe Road and Panama Lane, and
- Gosford Road and Taft Highway (PM hours).

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The modeling analysis was performed for worst-case wind angle and windspeed. The assumptions are shown below.

- Due to lack of specific receptor locations for CO hot spot analysis, locations near the most impacted intersections were used for this analysis. Selected modeling locations represent the intersections that would potentially experience LOS F or worse in year 2020. Receptor locations with the possibility of extended outdoor exposure are located between 21–51 meters from the roadway centerlines.
- Four receptor locations at each intersection, under worst-case wind angle conditions, were modeled to determine carbon monoxide dispersion concentrations. CO concentrations were modeled at these locations to assess the potential maximum CO exposure that would occur in year 2020.
- The calculations assume a meteorological condition of almost no wind (0.5 m/s), a flat topological condition between the source and the receptor, and a mixing height of 1,000 meters.
- CO concentrations are calculated for the one-hour averaging period, and then compared to the state one-hour CO standard. CO eight-hour averages are extrapolated using techniques outlined by the U.S. Environmental Protection Agency and compared to the carbon monoxide eight-hour standards.
- Emission factors for year 2020 were used in the model. Caltrans has indicated in its Transportation Project-Level Carbon Monoxide Protocol (Caltrans, revised 1997) that the "intersection" option of CALINE-4 should not be used because it calculates model emissions based on an algorithm developed for an outdated vehicle fleet. The "at-grade" option has been used in this analysis. Emission factors for approach and departure links were based on approach and departure average speeds as a function of traffic volume, average cruise speed, and percentage of red time.
- Concentrations are given in parts per million (ppm) at each of the receptor locations.
- Future year ambient CO concentrations were derived by averaging the last two years' CO levels monitored at Bakersfield's California Avenue station. Actual future ambient CO levels may be lower due to emissions control strategies that will be implemented between now and year 2020.

The input and output data for Caline-4 modeling is available upon request at the City of Bakersfield Planning Department as part of the WZI Inc. report (WZI Inc 2002).

Area Source Emissions

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Area source emissions result from fuel and personal product use. Electricity and natural gas are utilized by almost every commercial and residential development. The URBEMIS 7G computer model predicted the following emissions from natural gas usage and landscape maintenance. The model output is available upon request at the City of Bakersfield Planning Department as part of the WZI Inc. report (WZI Inc 2002). The numbers shown below are from typical energy

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consumption and do not include fireplaces and consumer products such as hairspray.

Criteria for Determining Significance

Based on the State CEQA Guidelines and standard professional practice, the proposed project would result in a significant impact on air quality if it would:

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

In addition to the above significant criteria, emission thresholds are contained in the *Guide for Assessing and Mitigating Air Quality Impacts* produced by the SJVUAPCD (SJVUAPCD 2002). According to the SJVUAPCD, impacts would be significant if the project would:

- expose sensitive receptors to substantial pollutant concentrations,
- produce greater than 10 tons/year ROG,
- produce greater than 10 tons/year NO_x,
- exceed National or California Ambient Air Quality Standard for CO (9 ppm 8-hr average; 20 ppm 1-hr average), or
- not comply with the San Joaquin Valley Air Pollution Control's Regulation VIII regarding particulate matter emissions from construction activities. Compliance with District Regulation VIII and the local zoning code will reduce particulate emission impacts to levels that are considered less-than-significant by the SJVUAPCD.

Additionally, the SJVUAPCD has not established a significance threshold for PM_{10}. However, because the San Joaquin Valley Air Basin is classified as a severe PM_{10} nonattainment area for the federal standard, emissions exceeding the SJVUAPCD's New Source Review threshold of 15 tons per year are considered a significant impact (Mitchell pers. comm.).

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Project Impacts

Impact B-1. Conflict With or Obstruct Implementation of Air Quality Attainment Plan

The California CAA requires non-attainment districts with severe air quality problems to provide for a five percent reduction in non-attainment emissions per year. The SJVAPCD prepared an Air Quality Attainment Plan for the SJVAB in compliance with the requirements of the Act. The plan requires best available retrofit technology on specific types of stationary sources to reduce emissions. The California CAA and the Air Quality Attainment Plan also identify transportation control measures as methods of reducing emissions from mobile sources. The California CAA defines transportation control measures as, "any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling or traffic congestion for the purpose of reducing motor vehicle emissions." The Air Quality Attainment Plan for the SJVAB identifies the provisions to accommodate the use of bicycles, public transportation and traffic flow improvements as transportation control measures.

The emissions of reactive organic gases and nitrogen oxides predicted by the model exceed the District's interim threshold levels; however, Golden Empire Transit (GET) provides public (bus) transportation in the Bakersfield metropolitan area. The project area is undeveloped; therefore, it is not currently served by GET. However, GET does provide service to the general area. The project could easily be serviced by GET upon completion. A "Traffic Impact Study" was prepared by McIntosh & Associates to evaluate impacts on the surrounding local roadway system due to traffic generated by the proposed development. The Traffic Impact Study recommends mitigation measures, such as street improvements or traffic signals, for intersections and street segments which fall below an acceptable LOS due to the impact of future traffic. The study allocates a proportionate share of the mitigation measures to the project. The proposed mitigation measures are traffic flow improvements, which are recognized transportation control measures in compliance with the Air Quality Attainment Plan.

The Air Quality Attainment Plan recognized growth of the population and economy within the air basin. The plan predicted the workforce in Kern County to increase 40 percent and housing to increase 30 percent from 1990 to 2000. This project can be viewed as growth that was anticipated by the plan and will not conflict with or obstruct implementation of the air quality plan. Consequently, this impact is considered less-than-significant.

Mitigation Measures

No mitigation is required.

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Residual Impacts

Impacts would be less than significant.

Impact B-2. Violation of Air Quality Standards or Substantial Contribution to an Existing or Projected Air Quality Violation

Construction-Related Emissions

Construction of the project would result in the temporary generation of emissions of ROG, NO_x, and PM_{10}. Construction-related emissions would result from construction equipment exhaust, construction employee vehicle exhaust, dust from land clearing, wind erosion of exposed soil, and volatile organic compound (VOC) emissions from painting, and asphalt paving. Construction-related emissions would vary substantially, depending on the level of activity, length of construction period, the specific construction operations, types of equipment, number of personnel, wind and precipitation conditions, and soil moisture content.

Table 3B-3 summarizes maximum daily construction emissions. Construction activities were divided into separate phases and analyzed separately. Consequently, project significance is not a comparison of the sum of all construction phases to the SJVUAPCD threshold levels. Instead, if one phase of construction is found to have a significant impact, than the entire project is considered to have a significant air quality impact.

The construction of the proposed project would result in the generation of fugitive dust. Compliance with SJVUAPCD Regulation VIII and the City of Bakersfield air quality regulations would result in no significant fugitive dust emissions. To ensure compliance, mitigation measures B-1 and B-2 below shall be implemented.

Additionally, as indicated in Table 3B-3, emissions from architectural coatings exceed the SJVUAPCD's ROG threshold of 10 tons per year. Mitigation will further reduce ROG levels, but not to levels below the significance threshold of 10 tons per year. Consequently, this impact is considered significant and unavoidable.

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Operation-Related Emissions

The proposed project would generate motor-vehicle trips that would in turn generate operation-related air emissions. Emission calculations for with-project conditions are based on the daily trip generation data provided by McIntosh & Associates. In addition, area source emissions were calculated based on land-use characteristics. Area source emissions result from fuel and personal product use. Electricity and natural gas are utilized by almost every commercial and

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residential development. Table 3B-4 summarizes the results of project operational emissions.

Table 3B-4 indicates that emissions resulting from project operations will exceed the SJVUAPCD's ROG and NO_X thresholds of 10 tons per year; and this impact is considered significant. Implementation of the following mitigation measures will reduce operational emissions, but not to a less-than-significant level. Consequently, this impact is considered significant and unavoidable.

Mitigation Measures

Construction-Related Mitigation Measures

Mitigation Measure B-1. Prior to approval of a grading plan, the project applicant shall submit a letter to the City of Bakersfield Planning Department from SJVUAPCD stating the dust suppression measures that shall be completed during construction activities to comply with the SJVUAPCD Regulation VIII.

Mitigation Measure B-2. In addition to compliance with Regulation VIII, the following measures shall be incorporated into building plans and implemented during construction activities to further reduce fugitive dust emissions associated with the project.

- Cover all access roads and parking areas with asphalt-concrete paving.
- Ensure that asphalt-concrete paving complies with SJVUAPCD Rule 4641 and restrict the use of cutback, slow-cure, and emulsified asphalt paving materials.
- Use water sprays or chemical suppressants on all unpaved areas to control fugitive dust emissions.
- Enclose, cover, or water all stockpiled soils to reduce fugitive dust emissions.
- Cease grading activities during periods of high winds (greater than 20 mph over a one-hour period).
- Limit construction-related vehicle speeds to 15 mph on all unpaved areas at the construction site.
- Cover all haul trucks when transporting loads of soils.
- Wash off construction and haul trucks to minimize the removal of mud and dirt from the project site.
- Shut down equipment when not in use for extended periods of time to reduce emissions associated with idling engines.
- Encourage ride sharing and use of transit transportation for construction employees commuting to the project site.
- Use electric equipment for construction whenever possible instead of fossil fuel-fired equipment.

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Table 3B-3. Emissions from Construction Activities

Construction Phase	Unmitigated				Mitigated			
	ROG (tons/year)	NO_X (tons/year)	PM_{10} (tons/year)	CO (tons/year)	ROG (tons/year)	NO_X (tons/year)	PM_{10} (tons/year)	CO (tons/year)
Site Grading	0.15	2.16	--	2.47	0.15	2.06	--	1.09
Construction Worker Trips	0.17	0.23	0.44	0.04	0.17	0.23	0.44	0.04
Stationary Equipment	0.33	0.27	--	0.02	0.33	0.27	--	0.02
Mobile Equipment- Gas	1.88	1.26	--	0.13	0	--	--	--
Mobile Equipment- Diesel	0.52	6.82	--	0.51	0.49	6.48	--	0.49
Architectural Coatings	12.95	--	--	--	12.3	--	--	--
Asphalt Offgassing	0.02	--	--	--	0.02	--	--	--
Total[1]	16.02	10.74	0.44	3.17	13.46	9.04	0.44	1.64
Threshold	**10**	**10**	**15**	**NA[2]**	**10**	**10**	**15**	**NA[2]**

1. Totals for construction emissions are presented for informational purposes only. Project significance is not a comparison of the sum total of all construction phases to the SJVUAPCD threshold levels. Rather, if one phase of construction is found to have a significant impact, than the entire project is considered to have a significant air quality impact.

2. The SJVUAPCD does not have a significance criteria for CO

Table 3B-4. Emissions from Project Operation

Operational Phase	ROG (tons/year)	NO_X (tons/year)	PM_{10} (tons/year)	CO (tons/year)
Area Source Emissions				
Natural Gas	0.09	1.24	0.0	0.49
Landscaping	0.01	0.0	0.0	0.06
Vehicular Emissions	12.21	34.98	1.4	119.77
Total	12.31	36.22	1.4	120.32
Threshold	**10**	**10**	**15**	**NA[1]**

1. The SJVUAPCD does not have a significance criteria for CO

Operational-Related Mitigation Measures

These projects will be required to comply with Title 24 of the California Code of Regulations regarding energy conservation standards. The applicant shall incorporate these requirements, along with the following mitigation measures, into the building plans:

Mitigation Measure B-3
Use low-NO_x emission water heaters.

Mitigation Measure B-4
Provide shade trees to reduce building cooling requirements consistent with the current landscaping ordinance requirements.

Mitigation Measure B-5
Install energy-efficient and automated air conditioners.

Mitigation Measure B-6
Exterior windows should all be double-paned glass.

Mitigation Measure B-7
Energy-efficient metal halide parking lights will be used.

Mitigation Measure B-8
Use EPA-approved wood burning stoves, fireplace inserts, or pellet stoves instead of conventional fireplaces.

Residual Impacts

Impacts would be significant and unavoidable.

Impact B-3. Cumulatively Considerable Net Increases of Criteria Pollutants

The State of California and EPA have designated the SJVAB as being in severe non-attainment for ozone. As seen in Table 3B-4, the project will result in cumulatively considerable net increases in ozone precursor (ROG and NO_X) emissions above the District thresholds of 10 tons per year. Consequently, this impact is considered significant. Additionally, construction-related emissions exceed District thresholds and are considered cumulatively considerable. Implementation of Mitigation Measures B-1 through B-8 will reduce air quality emissions, but not to a less-than-significant level. Consequently, this impact is considered significant and unavoidable.

Mitigation Measures

Mitigation Measures B-1 through B-8.

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Residual Impacts

Impacts would be significant and unavoidable.

Impact B-4. Expose Use of Sensitive Receptors to Substantial Pollutant Concentrations of CO

The impact of the proposed project on local carbon monoxide levels was assessed at these intersections with the CalTrans CALINE-4 Air Quality Model, which allows microscale CO concentrations to be estimated along each roadway corridor or near intersections. This model is designed to identify localized concentrations of carbon monoxide, often termed "hot spots." Year 2020 traffic data as predicted by the traffic study was used in the CALINE-4 model. Table 3B-5 summarizes CALINE-4 modeling results.

The CO air quality impact of this project is not likely to affect sensitive receptors. Sensitive receptors are areas where young children, chronically ill individuals, or other individuals more sensitive than the general population are located. Examples of sensitive receptors are schools, day care centers, and hospitals.

Table 3B-5 indicates that the proposed project will not create any significant localized concentrations of carbon monoxide in excess of the California ambient air quality standards of 9 ppm on an 8-hour average and 20 ppm on a 1-hour average. Neither standard would be equaled or exceeded at any of the intersections studied. As such, the CO impacts from the project are considered less than significant.

The potential ambient air quality impacts from this project are related to increased in traffic. The project is not expected to result in localized impacts, such as CO hot spots, and is not expected to impact nearby sensitive receptors. Therefore, this impact is considered less-than-significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

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Impacts would be less than significant.

Impact B-5. Creation of Objectionable Odors Affecting A Substantial Number Of People

The project consists of general commercial land uses. The generation of odors is generally associated with certain types of industrial and agricultural activities and is not anticipated to result from the proposed project. Therefore, the project is

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Table 3B-5. CALINE-4 Maximum Predicted Carbon Monoxide Concentrations

Intersection	Year 2020 w/ Project		Year 2020 w/o Project		Project Increase	
	1 hr[1] (ppm)	8 hr[2] (ppm)	1 hr[1] (ppm)	8 hr[2] (ppm)	1 hr[1] (ppm)	8 hr[2] (ppm)
Gosford Road & Stockdale Highway	12.7	8.9	12.7	8.9	0.0	0.0
Gosford Road & Ming Avenue	11.5	8.1	11.4	8.0	0.1	0.07
Ashe Road & Ming Avenue	9.5	6.7	9.5	6.7	0.0	0.0
Ashe Road & White Lane	11.7	8.2	11.5	8.1	0.2	0.14
Stine Road & White Lane	11.9	8.3	11.9	8.3	0.0	0.0
Ashe Road & Harris Road	9.2	6.4	9.2	6.4	0.0	0.0
Gosford Road & Panama Lane	9.5	6.7	9.1	6.4	0.0	0.0
Ashe Road & Panama Lane	8.6	6.0	8.5	6.0	0.1	0.07
Gosford Road & Taft Highway	7.8	5.5	7.8	5.5	0.0	0.0

Notes:

Predicted concentrations modeled using "worst case" option

[1] 1-hour concentrations include ambient CO of 6 ppm (extrapolated from 2 year, 8-hour average).

[2] Eight 1-hour concentrations were obtained by multiplying the 1-hour concentration by a factor of 0.7, as referenced in *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources*, USEPA, October 1992.

[3] parts per million

not expected to result in the generation of odors and impacts are considered less-than-significant.

Mitigation Measures

No mitigation is required.

Residual Impacts

Impacts would be less than significant.

Cumulative Impacts

This Air Quality Impact Study considered the affects of the project, as defined by the Traffic Study, with the cumulative impacts of growth in the area.

The *Guide for Assessing and Mitigating Air Quality Impacts* (SJVUAPCD 2002) under CEQA defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

This report considered the following cumulative impacts.

- Cumulative Ozone Impacts – Ozone impacts are the result of the cumulative emissions from numerous sources in the region and transport from outside the region. Ozone is in chemical reactions involving ROG, NO_X, and sunlight.
- Cumulative PM_{10} Impacts – PM_{10} has the potential to cause significant local problems during periods of dry conditions accompanied by high winds, and during periods of heavy earth disturbing activities. PM_{10} may have cumulative local impacts, if, for example, several unrelated grading or earth moving projects are underway simultaneously at nearby sites.
- Cumulative CO Impacts – Cumulative carbon monoxide impacts are accounted for in the CO Hotspot Analysis described earlier in the assessment. Traffic levels were used to determine if the proposed project would have a significant cumulative impact.
- Cumulative Hazardous Air Pollutant (HAP) Impacts – Cumulative analysis for HAPs focused on local impacts on sensitive receptors. The District recommends screening a radius of 1 mile for HAP cumulative impacts.

The existing and proposed projects within one mile of the proposed project are shown in Figure 2-5. Three proposed residential development projects have been identified and modeled using the URBEMIS7G computer model to predict cumulative impacts. Emissions for the operational phase of these proposed projects were based on housing lot totals provided by the City of Bakersfield Planning Department (WZI Inc. 2002). The predicted model outputs, including the Gosford Village project, are summarized in Tables 3B-6 and 3B-7.

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City of Bakersfield Planning Department has advised that no other proposed or existing project, besides the three that have been previously identified, exist within a 1-mile radius of the project (WZI Inc. 2002). Therefore, the cumulative impacts for ROG and NO_X attributable to this project are considered cumulatively considerable based on the District's levels of significance as summarized in Table 3B-7.

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Table 3B-6. Cumulative Impact Model Results

Project Name	Number of Lots	Emissions Source	Mitigated Emissions ROG (tons/year)	NO_X (tons/year)	PM_{10} (tons/year)	CO (tons/year)
South Pacific District	95	Area	5.26	0.38	0.66	5.00
Christian & Mission Alliance		Vehicle	1.09	3.20	0.13	11.12
Burlington Homes	269	Area	14.84	1.07	1.87	14.16
		Vehicle	2.87	8.27	0.34	28.77
Coleman Homes, Inc.	267	Area	14.73	1.06	1.85	14.05
		Vehicle	2.87	8.30	0.34	28.86

Table 3B-7. Cumulative Impact Model Emissions Totals

Project Name	ROG (tons/year)	NO_X (tons/year)	PM_{10} (tons/year)	CO (tons/year)
South Pacific District	6.33	3.58	0.79	16.12
Christian & Mission Alliance				
Burlington Homes	17.71	9.34	2.21	42.93
Coleman Homes, Inc.	17.6	9.36	2.19	42.91
Gosford Village	14.81	43.95	1.67	146.13
Totals	56.45	66.23	6.86	248.09
Threshold	**10**	**10**	**15**	NA[1]

PROOF OF SERVICE

I, Laura Cummings, certify and declare as follows:

I am over the age of 18 years, and not a party to this action. My business address is 2291 West March Lane, Suite B100, Stockton, California 95207, which is located in the county where the mailing described below took place.

I am readily familiar with the business practice at my place of business for collection and processing of correspondence for mailing. On November 10, 2005 at my place of business a copy of **DECLARATION OF STEVEN A. HERUM IN SUPPORT OF PETITIONER HANFORD NO ON WAL-MART SUPERCENTER'S REQUEST FOR JUDICIAL NOTICE** was placed for deposit following ordinary course of business as follows:

[ ] **BY U.S. MAIL** with the United States Postal Service in a sealed envelope, with postage thereon fully prepaid.

The envelope was addressed as follows:

[SEE ATTACHED SERVICE LIST]

[X] **BY FEDERAL EXPRESS/OVERNIGHT MAIL** in a sealed envelope, with postage thereon fully prepaid. [Code Civ. Proc., §§ 1013(c), 2015.5.]

[ ] **BY PERSONAL SERVICE/HAND DELIVERY.**

[ ] **BY FACSIMILE** at approximately _____ .m. by use of facsimile machine telephone number (209) 472-7986. I caused the facsimile machine to print a transmission record of the transmission, a copy of which is attached to this declaration. The transmission was reported as complete and without error. [Cal. Rule of Court 2008 and 2003(3).]

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated: November 10, 2005

Laura Cummings

Laura Cummings

01818

Hanford No On Wal-Mart and Valley Advocates v. City of Hanford
[Kings County Superior Court Case No. 04-C-0273]
Appellate Court No. F048303

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California Supreme Court (5 Copies) 350 McAllister St., Rm. 1295 San Francisco, CA 94102	

01819

FINAL
Environmental Impact Report

General Plan Amendment / Zone Change #02-0193



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5.4 AIR QUALITY

This Section evaluates air quality associated with short and long-term impacts resulting from buildout of the proposed Project. Information in this Section is based on the *Air Quality Impact Study* prepared by WZI Inc. (June 2002), which is included as Appendix 15.3, *Air Quality Data*, of this document. RBF Consulting conducted a peer review of the WZI report which was prepared pursuant to the San Joaquin Valley Air Pollution Control District's *Guide for Assessing and Mitigating Air Quality Impacts*, January 10, 2002 Revision.

EXISTING CONDITIONS

ENVIRONMENTAL SETTING

The proposed Project site is located in the San Joaquin Valley Air Basin, within the City of Bakersfield, and within the jurisdiction of the San Joaquin Valley Air Pollution Control District. The topography of the air basin includes foothills and mountain ranges to the east, west, and south, and a relatively flat valley floor. The valley is characterized by long, hot, dry summers, and short, foggy winters. The features of the valley produce climatic episodes such as frequent temperature inversions. The topography of the Project area is flat at an elevation of approximately 365 feet above mean sea level.

STATE AND NATIONAL AMBIENT AIR QUALITY STANDARDS

National Ambient Air Quality Standards (NAAQS) are assigned as the result of provisions of the Federal Clean Air Act. The NAAQS establish acceptable pollutant concentrations which may be equaled continuously or exceeded only once per year. California Ambient Air Quality Standards (CAAQS) are limits set by the California Air Resources Board (CARB) that cannot be equaled or exceeded. An air pollution control district must prepare an Air Quality Attainment Plan if the standards are not met. The California and National Ambient Air Quality Standards are outlined in Table 5.4-1, *Ambient Air Quality Standards*.

The following is a summary of the characteristics of primary and secondary pollutants.

Ozone (O_3)

Ozone is a pungent, colorless toxic gas. Ozone makes up 90 percent of the group of pollutants known as photochemical oxidants. Ozone and other photochemical oxidants are products of atmospheric reaction of nitrogen oxides and reactive organic gases with ultraviolet light. High ozone levels can adversely affect plants, and in humans, can cause respiratory irritation.

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Carbon Monoxide (CO)

Carbon monoxide is an odorless, colorless toxic gas produced by incomplete combustion of carbon-containing substances. Carbon monoxide interferes with the transfer of fresh oxygen from blood into body tissues.

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Table 5.4-1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 µg/m³)	Ultraviolet Photometry	0.12 ppm (235 µg/m³)	Same as Primary Standard	Ethylene Chemiluminescence
	8 Hour	—		0.08 ppm (157 µg/m³)		
Respirable Particulate Matter (PM_{10})	Annual Geometric Mean	30 µg/m³	Size Selective Inlet Sampler ARB Method P (8/22/85)	—	Same as Primary Standard	Inertial Separation Gravimetric Analysis
	24 Hour	50 µg/m³		150 µg/m³		
	Annual Arithmetic Mean	—		50 µg/m³		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		65 µg/m³	Same as Primary Standard	Inertial Separation Gravimetric Analysis
	Annual Arithmetic Mean			15 µg/m³		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 µg/m³)	Non-dispersive Infrared Photometry (NDIR)	9.0 ppm (10 µg/m³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 µg/m³)		35 ppm (40 µg/m³)		
	8 Hour (Lake Tahoe)	6 ppm (7 µg/m³)		—		
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	—	Gas Phase Chemiluminescence	0.053 ppm (100 µg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 µg/m³)		—		
Lead	30 days average	1.5 µg/m³	AHL Method 54 (12/74) Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m³	Same as Primary Standard	
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	—	Fluorescence	0.04 ppm (105 µg/m³)	—	Pararosoaniline
	24 Hour	0.04 ppm (105 µg/m³)		0.04 ppm (105 µg/m³)	—	
	3 Hour	—		—	0.05 ppm (1300 µg/m³)	
	1 Hour	0.25 ppm (655 µg/m³)		—	—	
Visibility Reducing Particles	8 Hour (10 a.m. to 6 p.m., PST)	Insufficient amount to produce an extinction coefficient of 0.23 per kilometer-visibility of ten miles or more (0.07-30 miles or more for Lake Tahoe) due to particles when the relative humidity is less than 70 percent. Method: ARB Method V (8/18/89).		No Federal Standards		
Sulfates	24 Hour	25 µg/m³	Turbidimetric Barium Sulfate-AIHL Method 61 (2/76)			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m³)	Cadmium Hydroxide STRactan			

Nitrogen Oxides (NOx)

Nitrogen oxides are formed from nitrogen and oxygen at high combustion temperatures and further reacts to form other oxides of nitrogen, such as nitrogen dioxide. Nitrogen dioxide reacts with ultraviolet light to initiate reactions producing photochemical smog, and it reacts in air to form nitrate particulates. Nitrogen dioxide significantly affects visibility.

Sulfur Oxides (SOx)

Sulfur dioxide is a colorless, pungent gas primarily formed by combustion of sulfur-containing fossil fuels. High sulfur dioxide concentrations irritate the upper respiratory tract, while low concentrations of sulfur dioxide injure lung tissues. Sulfur oxides can react to form sulfates which significantly reduce visibility.

Particulates (PM_{10})

Dust, aerosols, soot, mists, and fumes make up atmospheric particulates. Sources of particulates include industrial and agricultural operations, combustion, and photochemical actions of pollutants in the atmosphere. Particulates substantially reduce visibility and adversely affect the respiratory tract. PM_{10} is made up of finely divided particulate matter less than 10 microns in diameter.

Reactive Organic Gases (ROG)

Organic compounds are composed primarily of carbon and hydrogen. Motor vehicle emissions and evaporation of organic compounds produce hydrocarbon emissions. Hydrocarbon levels can affect plant growth. Many hydrocarbon species react in the atmosphere to form photochemical smog.

Air Quality - Basin-wide: The San Joaquin Valley Air Pollution Control District has jurisdiction in eight counties located in the San Joaquin Valley, including the Bakersfield area. The San Joaquin Valley Air Basin has been designated as attainment for carbon monoxide and non-attainment for ozone and particulate matter (PM_{10}) by federal and California standards. The California Clean Air Act requires that all reasonable stationary and mobile source control measures be implemented in non-attainment areas to help achieve a mandated, five percent per year reduction in ozone precursors, and to reduce population exposures. Table 5.4-2, *Ambient Air Quality Classifications Project Area of the San Joaquin Valley*, contains the ambient air quality classifications for the Bakersfield area.

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Table 5.4-2
Ambient Air Quality Classifications Project Area of the San Joaquin Valley

Pollutant	State	Federal
Carbon Monoxide	Attainment	Attainment
Ozone	Non-Attainment/Severe	Non-Attainment/Severe
Oxides of Nitrogen	Attainment	Attainment
Sulfur Dioxide	Attainment	Attainment
Particulate Matter <10 microns	Non-Attainment	Non-Attainment/Serious

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Air Monitoring Station. The closest air monitoring station to the Project site is the Bakersfield Station located at 5558 California Avenue. The station monitors particulates, ozone, carbon monoxide, and nitrogen dioxide.

Table 5.4-3, *Maximum Pollutant Levels at Bakersfield's California Avenue Monitoring Station*, contains the maximum pollutant levels detected during 1999 through 2001 (the latest data available).

Table 5.4-3
Maximum Pollutant Levels at Bakersfield's California Avenue Monitoring Station

Pollutant	Time Averaging	Year 1999 Maximums	Year 2000 Maximums	Year 2001 Maximums	Standards	
					National	State
Ozone (O_3)	1 Hour	0.116 ppm	0.125 ppm	0.129 ppm	0.12 ppm	0.09 ppm
Ozone (O_3)	8 Hour	0.101 ppm	0.106 ppm	0.115 ppm	0.08 ppm	—
Carbon Monoxide (CO)	8 Hour	4.51 ppm	4.89 ppm	3.41 ppm	9 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 Hour	0.107 ppm	0.089 ppm	0.115 ppm	—	0.25 ppm
Nitrogen Dioxide (NO_2)	1 Hour Annual Average	0.025 ppm	0.024 ppm	—	0.053 ppm	—
Particulates (PM_{10})	24 Hour	143 µg/m³	140 µg/m³	190 µg/m³	150 µg/m³	50 µg/m³
	Federal Annual Geometric Mean	47 µg/m³	45 µg/m³	47 µg/m³	50 µg/m³	—
	State Annual Geometric Mean	40 µg/m³	39 µg/m³	43 µg/m³	—	30 µg/m³
Sulfur Dioxide (SO_2)	24 Hour	0.006 ppm	0.003 ppm	0.005 ppm	0.14 ppm	0.04 ppm

Notes: ppm = parts per million
µg/m³ = micrograms per cubic meter
— = no applicable

Source: CARB Website, 2002.

SENSITIVE RECEPTORS

Air quality impacts of this Project are not likely to affect sensitive receptors. Sensitive receptors are areas where young children, chronically ill individuals, or other individuals more sensitive than the general population are located. Examples of sensitive receptors are schools, day care centers, and hospitals.

The nearest receptor is W.A. Kendrick School, which is located approximately 0.5-miles north of the Project site. There are also a residential areas bordering the Project site to the north and east, which could contain sensitive receptors.

STANDARDS OF SIGNIFICANCE

SIGNIFICANCE CRITERIA

In accordance with CEQA, the effects of a Project are evaluated to determine if they will result in a significant impact on the environment. An EIR is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts which are identified. The criteria, or standards, used to determine the significance of impacts may vary depending on the nature of the Project. Air quality impacts resulting from the implementation of the proposed Project could be considered significant if they cause any of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statement 5.4-4);
- Violate any air quality standard or contribute substantially to an existing or Projected air quality violation (refer to Impact Statements5.4-1 and 5.4-2);
- 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 (including releasing emissions which exceed quantitative thresholds for ozone precursors) (refer to Impact Statement 5.4-5);
- Exposes sensitive receptors to substantial pollutant concentrations (refer to Impact Statement5.4-2 and 5.4-3); and/or
- Create objectionable odors affecting a substantial number of people (refer to Section 10.0, *Effect Found Not to be Significant*).

Potential impacts associated with the proposed Project have been identified. The impacts are categorized according to topic then numbered consecutively under each category. Mitigation measures at the end of this Section directly correspond to the numbered impact statements below.

IMPACTS

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SHORT-TERM EMISSIONS

5.4-1 *Significant short-term air quality impacts may occur during site preparation and project construction. These impacts are considered less than significant with implementation of the recommended mitigation measures. (Mitigation in this instance refers to applicable City Development Code Sections and SJV APCD Rules.)*

Short-term impacts from the Projects would primarily result in fugitive particulate matter emissions during construction. Grading, excavation, trenching, filling, and other construction activities result in increased dust emissions. Regulation VIII of the San Joaquin Valley Unified Air Pollution Control District specifies control measures for specified outdoor sources of fugitive particulate matter emissions. Rule 8010

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contains administration requirements, Rule 8020 applies to construction activities, and Rule 8070 applies to vehicle and equipment parking, fueling, and service areas. The Air District does not require a permit for these activities, but does impose measures to control fugitive dust, such as the application of water or a chemical dust suppressant.

Construction would also result in exhaust emissions from diesel-powered heavy equipment. Exhaust emissions from construction include emissions associated with the transport of machinery and supplies to and from the site, emissions produced onsite as the equipment is used and emissions from trucks transporting excavated materials from the site and fill soils to the site. Examples of these emissions include CO, ROG, NOx, SOx, and PM_{10}.

The proposed Project may have potentially significant short-term construction equipment emission impacts, which could exceed the Air District threshold levels for several criteria pollutants. Exhaust emission factors for typical diesel-powered heavy equipment, are found in U.S. EPA AP-42, Volume II, Table II-7.1 (1985) (refer to Table 5.4-4, *Emission Factors for Heavy-Duty Diesel-Powered Equipment*). Exhaust emissions would vary substantially from day to day. Numerous variables factored into estimating total construction emissions include: level of activity, length of construction period, number of pieces and types of equipment in use, site characteristics, weather conditions, number of construction personnel, and amount of materials to be transported on/offsite. Additional exhaust emissions would be associated with the transport of workers and materials. Because the specific mix of construction equipment needed for future development is not presently known, equipment emissions cannot be accurately quantified. This data is not available until the construction of specific project components is undertaken. The construction equipment should be properly and routinely maintained, as recommended by manufacturer manuals, to control exhaust emissions.

Table 5.4-4
Emission Factors for Heavy-Duty Diesel-Powered Equipment

Type of Equipment	Pollutant (lb/hr)			
	ROG	NOx	CO	PM
Track-Type Tractor	0.12	1.26	0.35	0.11
Wheeled Tractor	0.18	1.27	3.59	0.14
Wheeled Dozer	0.19	4.17	1.79	0.17
Scraper	0.27	3.84	1.26	0.41
Motor Grader	0.039	0.71	0.15	0.061
Wheeled Loader	0.23	1.89	0.57	0.17
Track-Type Loader	0.095	0.83	0.20	0.059
Off-Highway Truck	0.19	4.17	1.79	0.26
Roller	0.065	0.66	0.30	0.050
Miscellaneous	0.15	1.69	0.68	0.14
Source: U.S. EPA AP-42, Volume II, Table II-7.1, 1985.				

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The Bakersfield area and the San Joaquin Valley are non-attainment for particulates. Although the proposed land uses are not considered a potential source for significant particulate emissions, fugitive particulate emissions would occur during construction. Construction activity has the potential to generate 1.2 tons of total suspended particulates per acre per month of activity.[1] The proposed Project involves development of 37.52 acres. Fugitive construction emissions have the potential to cause a significant impact on air quality. The application of water, or other dust suppressant, could significantly reduce emissions. Doubling the moisture content could reduce emissions on unpaved roads by 75 percent[2] and use of a chemical dust suppressant on storage piles could reduce emissions by approximately 90 percent.[3] Assuming that the total suspended particulates are comprised of 50 percent PM_{10} and that the application of water controls emissions by 50 percent, fugitive PM_{10} emissions during construction could be reduced to 0.3 tons per acre per month of activity. Actual emissions would depend on the level of activity and the type of control being used. A construction schedule for each project component would be required to develop accurate emission estimates from construction. Control measures required and enforced by the San Joaquin Valley Air Pollution Control District under Regulation VIII would control these short-term emission sources to a level that is considered less than significant provided a limited amount of acres is disturbed at any one time. The following three rules related to fugitive dust control apply to this project:

- Rule 8010 Fugitive dust administrative requirements for control of fine particulate matter.
- Rule 8020 Fugitive dust requirements for control of fine particulate matter from construction, demolition, excavation and extraction activities.
- Rule 8070 Fugitive dust requirements for control of fine particulate matter from vehicle and/or equipment parking, shipping, receiving, transfer, fueling and service areas one acre or larger.

In addition, the Project shall include the following as required by the Bakersfield Zoning Code.

- Water sprays or chemical suppressants must be used in all unpaved areas to control fugitive emissions.
- All access roads and parking areas must be covered with asphalt-concrete paving.

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[1] EPA, *Compilation of Air Pollutant Emission Factors*, Volume I: Stationary Point and Area Sources, EPA Publication No. AP-42, Fifth Edition, GPO Stock No. 055-000-00251-7, January 1995; Section 13.2.3, Heavy Construction Operations.

[2] United States Environmental Protection Agency, *Control of Open Fugitive Dust Sources*, EPA-450/3-88-008, September 1988.

[3] Ibid.

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Compliance with Regulation VIII of the San Joaquin Valley Unified Air Pollution Control District and the Bakersfield Zoning Code would reduce particulate emission impacts to levels that are considered less than significant.

LONG-TERM OPERATIONAL EMISSIONS

5.4-2 *The Project may result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions and indirect impacts from electricity and natural gas consumption. This impact is considered significant and unavoidable for ROG and NOx.*

Long-term air quality impacts would consist of mobile source emissions generated from project-related traffic and area source emissions generated directly from the natural gas consumed and indirectly from the power plant providing electricity to the Project site. Emissions associated with each of these sources are discussed and calculated below.

Mobile Source - Ozone

The Bakersfield area is a non-attainment area for federal air quality standards for ozone and particulates. Nitrogen oxides and reactive organic gases are regulated as ozone precursors. A precursor is defined by the District as "a directly emitted air contaminant that, when released into the atmosphere, forms or causes to be formed or contributes to the formation of a secondary air contaminant for which an ambient air quality standard has been adopted..."

The District regulates air quality in the Bakersfield area. The predicted emissions associated with vehicular traffic (mobile sources) are not subject to the District's permit requirements. However, the District is responsible for overseeing efforts to improve air quality within the San Joaquin Valley. The District has prepared an Air Quality Attainment Plan to bring the San Joaquin Valley into compliance with the California Ambient Air Quality Standard for ozone. The District reviews land use changes to evaluate the potential impact on air quality. The District has established a significance level for ROG and NOx of 10 tons per year each, but has not established levels of significance for other pollutants.

Vehicle emissions have been estimated for the year 2020 using the URBEMIS 7G computer model from the California Air Resources Board. This model predicts carbon monoxide, total hydrocarbons, nitrogen oxides, oxides of sulfur, and particulate matter emissions from motor vehicle traffic associated with new or modified land uses. Appendix 15.3, *Air Quality Data*, contains the URBEMIS 7G modeling results.

Project-related mobile source mitigated emissions for ROG and NOx would be considered significant based on the District's levels of significance as summarized on Table 5.4-5, *Long-Term Project Emissions*.

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Table 5.4-5
Long-Term Project Emissions

Buildout	ROG (ton/year)	NOx (ton/year)	CO (ton/year)	PM10 (ton/year)
Project Buildout				
• Mobile Source Emissions	10.39	30.9	105	1.24
• Area Source Emissions (Mitigated)	00.06	00.71	0.33	0.00
Total Mitigated Emissions	10.45	31.61	105.33	1.24
SJVAPCD Significance Threshold	10	10	N/A	N/A
Is Threshold Exceeded? (Significant Impact?)	Yes	Yes	N/A	N/A

ROG = reactive organic gases
NOx = nitrogen oxides
CO = carbon monoxide
PM_{10} = fine particulate matter

Area Source Emissions

The proposed Project would result in personal product use, and would create electrical demands and heating demands resulting in natural gas combustion. Electrical demand would result in electrical generation emissions from local power plants. The URBEMIS 7G computer model predicted emissions from typical energy consumption, gas usage, landscape maintenance, and consumer products. The model output is included in Appendix 15.3, Air Quality Data. As indicated in Table 5.4-5, *Long-Term Project Emissions*, area source emissions generated by the Project at buildout would not individually exceed SJVAPCD thresholds. However, as discussed below, area source emissions combined with vehicular emissions would cause operational emissions to exceed SJVAPCD thresholds for ROG and NO_x.

Potential Effect on Sensitive Receptors

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Air quality impacts of the Project are not likely to affect sensitive receptors. Sensitive receptors are areas where young children, chronically ill individuals, or other individuals more sensitive than the general population are located. Examples of sensitive receptors are schools, day care centers, and hospitals.

The nearest receptor is W.A. Kendrick School, which is located approximately 0.5-mile north of the Project site. There is also a residential area bordering the Project site to the north and east, which could contain sensitive receptors.

The potential ambient air quality impacts from the Project are related to increases in traffic. The Project is not expected to result in localized impacts, such as CO hot spots, and is not expected to impact nearby sensitive receptors.

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Potential Impacts from Odors and Hazardous Air Pollutants

The Project consists of general commercial land uses. The generation of odors and hazardous air pollutants is generally associated with certain types of industrial and agricultural activities. Therefore, the Project is not expected to result in the generation of odors or hazardous air pollutants.

Total Project Operational Emissions

As shown in Table 5.4-5, the mobile source and area emissions associated with the proposed Project would generate pollutant emissions in excess of SJVAPCD thresholds. Thus, implementation of the proposed Project would create a significant and unavoidable individual Project impact from ROG and NOx emissions.

LOCALIZED CO EMISSIONS

5.4-3 *The Project may expose sensitive receptors to substantial pollutant concentrations. Analysis has concluded that a less than significant impact would occur in this regard.*

Mobile Source - Carbon Monoxide

Carbon monoxide emissions are a function of vehicle idling time and, thus, under normal meteorological conditions, depend on traffic flow conditions. Carbon monoxide transport is extremely limited; it disperses rapidly with distance from the source. Under certain extreme meteorological conditions, however, CO concentrations close to a congested roadway or intersection may reach unhealthful levels, affecting sensitive receptors (residents, school children, hospital patients, the elderly, etc.). Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable Level of Service (LOS). CO "Hot Spot" modeling is required if a traffic study reveals that the project will reduce the LOS on one or more streets to E or F; or, if the project will worsen an existing LOS F.

A traffic study was prepared by Ruettgers & Schuler for the proposed Project. The study indicates that twelve unsignalized intersections (based on Year 2020 + projections) warrant a CO Hot Spot analysis:

- South H Street at McKee Road*
- Hosking Road at Wible Road*
- Hosking Road at South H Street*
- Berkshire Road at South H Street*
- Panama Lane at Gosford Road*
- Panama Lane at Monitor Street*
- White Lane at State Road 99 North Bound Ramp*
- Berkshire Road at Wible Road*
- White Lane at Wible Road
- White Lane at State Road 99 South Bound Ramps
- Panama Lane at Wible Road
- Wible Road at Harris Road

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*Denotes intersections for which the CO analysis was based on mitigation measures proposed in the Traffic Study.

The impact of the proposed Project on local carbon monoxide levels was assessed at these intersections with the Caltrans CALINE-4 Air Quality Model, which allows microscale CO concentrations to be estimated along each roadway corridor or near intersections. This model is designed to identify localized concentrations of carbon monoxide, often termed "hot spots". Year 2020 traffic as predicted by the Traffic Study was used in the CALINE-4 model.

The modeling analysis was performed for worst-case wind angle and windspeed. The assumptions used in conducting the modeling analysis are provided in Appendix 15.3, *Air Quality Data*.

The results of the modeling analysis are shown in Table 5.4-6, *CALINE-4 Predicted Carbon Monoxide (CO) Concentrations*. The modeling results were compared to the California ambient air quality standards for carbon monoxide of 9 ppm on an 8-hour average and 20 ppm on a 1-hour average. Neither standard would be equaled or exceeded at any of the intersections studied. As such, the CO impacts from the proposed Project are considered less than significant. The input and output data is contained in Appendix 15.3, *Air Quality Data*.

Table 5.4-6
CALINE-4 Predicted Carbon Monoxide (CO) Concentrations

Intersection	Maximum Modeled Impact Year 2020 With Project		Maximum Modeled Impact Year 2020 Without Project		Project Increase	
	1-Hour (ppm)	8-Hour (ppm)	1-Hour (ppm)	8-Hour (ppm)	1-Hour (ppm)	8-Hour (ppm)
South H Street at Mckee Road	8.3	5.8	8.2	5.7	0.1	0.07
Hosking Road at Wible Road	8.2	5.7	8.2	5.7	0.0	0.00
Hosking Road at South H Street	7.7	5.4	7.7	5.4	0.0	0.00
Berkshire Road at South H Street	7.6	5.3	7.5	5.3	0.1	0.07
Panama Lane at Gosford Road	8.4	5.9	8.4	5.9	0.0	0.00
Panama Lane at Monitor Street	9.5	6.7	9.3	6.5	0.2	0.14
White Lane at State Road 99 North Bound Ramp	9.2	6.4	9.1	6.4	0.1	0.07
Berkshire Road at Wible Road	7.9	5.6	7.8	5.5	0.1	0.07
White Lane at Wible Road	12.1	8.5	12.0	8.4	0.1	0.07
White Lane at State Road 99 South Bound Ramps	11.1	7.8	11.1	7.8	0.0	0.00
Panama Lane at Wible Road	11.5	8.1	11.0	7.7	0.5	0.35
Wible Road at Harris Road	9.8	6.9	9.7	6.8	0.1	0.07

Notes: 1. 1-hour concentrations include ambient CO of 6.8 ppm (second highest 2 year impact, 8-hour average corrected upwards for 1-hour averaging period).
2. 8-hour concentrations were obtained by multiplying the 1-hour concentration by a factor of 0.7, as referenced in *Screening Procedures for Estimating the Air Quality Impact of Stationary Sources*, USEPA, October, 1992. Predicted concentrations modeled using "worst case" option.

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CONFORMITY WITH AIR QUALITY ATTAINMENT PLAN

5.4-4 *The Project has the potential to conflict with the Air Quality Attainment Plan. Analysis has concluded that a less than significant impact would occur in this regard.*

As noted above under the Significance Criteria discussion, a potentially significant impact to air quality would occur if the Project would conflict with or obstruct implementation of the applicable air quality plan. Although the Project would represent an incremental negative impact to air quality in the Basin, of primary concern is that Project-related impacts have been properly anticipated in the regional air quality planning process and reduced whenever feasible. Therefore, it is necessary to assess the Project's Conformity with the AQMP.

Conformity with the Air Quality Attainment Plan

The California Clean Air Act requires non-attainment districts with severe air quality problems to provide for a five percent reduction in non-attainment emissions per year. The San Joaquin Valley Air Pollution Control District prepared an Air Quality Attainment Plan for the San Joaquin Valley Air Basin in compliance with the requirements of the Act. The plan requires best available retrofit technology on specific types of stationary sources to reduce emissions. The California Clean Air Act and the Air Quality Attainment Plan also identify transportation control measures as methods of reducing emissions from mobile sources. The California Clean Air Act defines transportation control measures as "any strategy to reduce vehicle trips, vehicle use, vehicle miles traveled, vehicle idling or traffic congestion for the purpose of reducing motor vehicle emissions." The Air Quality Attainment Plan for the San Joaquin Valley Air Basin identifies the provisions to accommodate the use of bicycles, public transportation, and traffic flow improvements as transportation control measures.

The ROG and NOx emissions predicted by the model exceed the District's interim threshold levels. Golden Empire Transit (GET) provides public (bus) transportation in the Metropolitan Bakersfield area. The Project area is located near two separate GET bus routes. The possibility exists that when the Project is completed, the City would increase the level of service to the Project area, thereby reducing the operational (vehicular) emissions attributable to the Project.

The "traffic impact study" prepared by Ruettgers & Schuler recommends mitigation measures, such as street improvements and traffic signals, for intersections and street segments which fall below an acceptable Level of Service due to the impact of future traffic. The study allocates a proportionate share of the mitigation measures to the Project. The proposed mitigation measures are traffic flow improvements that are recognized transportation control measures in compliance with the Air Quality Attainment Plan.

The Air Quality Attainment Plan recognized growth of the population and economy within the air basin. The Plan predicted the workforce in Kern County to increase 40 percent and housing to increase 30 percent from 1990 to 2000. Although the proposed project was not anticipated by the Plan, it is consistent with growth

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projections in the County. Thus, the Project is considered consistent with the Air Quality Attainment Plan.

CUMULATIVE IMPACTS

5.4-5 *Impacts to regional air quality resulting from cumulative development may significantly impact existing air quality levels. Analysis has concluded that a less than significant impact would occur in this regard.*

This Air Quality Impact Study considered the affects of the Project, as defined by the Traffic Study, with the cumulative impacts of growth in the area.

The *Guide for Assessing and Mitigating Air Quality Impacts*[4] under CEQA defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The document also states that "any proposed project that would individually have a significant air quality impact... would also be considered to have a significant cumulative air quality impact."[5]

This study considered the following cumulative impacts:

- Cumulative Ozone Impacts. Ozone impacts are the result of the cumulative emissions from numerous sources in the region and transport from outside the region. Ozone is in chemical reactions involving ROG, NOx, and sunlight.
- Cumulative PM_{10} Impacts. PM_{10} has the potential to cause significant local problems during periods of dry conditions accompanied by high winds, and during periods of heavy earth disturbing activities. PM_{10} may have cumulative local impacts, if for example, several unrelated grading or earth moving projects are underway simultaneously at nearby sites.
- Cumulative CO Impacts. Cumulative carbon monoxide impacts are accounted for in the CO Hotspot Analysis described earlier in this assessment. Traffic levels were used to determine if the proposed Project would have a significant cumulative impact.
- Cumulative Hazardous Air Pollutant (HAP) Impacts. Cumulative analysis for HAPs focused on local impacts on sensitive receptors. The District recommends screening a radius of one mile for HAP cumulative impacts.

The existing and proposed projects within one mile of the proposed Project are illustrated on Exhibit 4-1, *Cumulative Projects Location Map*. Six proposed residential development projects have been identified and modeled using the URBEMIS 7G computer model to predict cumulative impacts. Emissions for the operational phase of the proposed projects were based on housing lot totals provided by the City of Bakersfield Planning Department.[6] In accordance with district

[4] CARB Guide for Assessing and Mitigating Air Quality Impacts, revised January 10, 2002.

[5] City of Bakersfield, Active Tentative Tracts, David Dow, last updated April 25, 2002.

[6] CARB Guide for Assessing and Mitigating Air Quality Impacts, revised January 10, 2002.

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guidance, fireplaces were not considered since they are seasonal in nature. The predicted model outputs, including the proposed Project, are summarized in Table 5.4-7, *Cumulative Impact Model Results*, and Table 5.4-8, *Cumulative Impact Emission Totals*, and are included in Appendix 15.3, *Air Quality Data*.

Table 5.4-7
Cumulative Impact Model Results

Subdivision Name	Number of Lots	Emissions Source	ROG (lbs/day) Unmitigated	ROG (lbs/day) Mitigated	NOx (lbs/day) Unmitigated	NOx (lbs/day) Mitigated	CO (lbs/day) Unmitigated	CO (lbs/day) Mitigated	PM10 (lbs/day) Unmitigated	PM10 (lbs/day) Mitigated
T5327R – Genevieve Myers	93	Area Source	0.87	0.36	0.29	0.00				
		Vehicle Source	3.45	5.03	28.98	0.19				
T5738 – John Giumarra, Jr.	504	Area Source	4.74	1.93	1.57	0.01				
		Vehicle Source	16.6	23.8	137	0.92				
T5762R – R-M Development, Inc.	143	Area Source	1.34	0.55	0.44	0.00				
		Vehicle Source	5.14	7.47	43.0	0.29				
T5941 – Cemland Development	240	Area Source	2.26	0.92	0.75	0.00				
		Vehicle Source	8.33	12.0	69.4	0.47				
T6064 – Summerwind Group, Inc.	188	Area Source	1.77	0.72	0.58	0.00				
		Vehicle Source	6.64	9.62	55.4	0.37				
T6092 – Cemland Development	187	Area Source	1.76	0.72	0.58	0.00				
		Vehicle Source	6.60	9.57	55.1	0.37				

The *Guide for Assessing and Mitigating Air Quality Impacts*[7] states, "impacts of local pollutants (CO, HAPs) are cumulatively significant when modeling shows that the combined emissions from the project and other existing and planned projects will exceed air quality standards." The project is not expected to cause a cumulative impact in excess of the California Ambient Air Quality Standards (CAAQS) for several reasons. CO "hot spot" modeling demonstrated that the ambient air quality standards for CO would not be exceeded as a result of the Project. Also, the Project is not a source of HAP emissions and therefore cannot have a significant impact from HAPs.

For ROG and NOx, the only significance thresholds exceeded would be from the Project's mobile source emissions. The Project was below the thresholds for both ROG and NOx for stationary source emissions. Therefore the Project is considered to be cumulatively less than significant for ROG and NOx. PM_{10} emissions from the Project are minimal and are expected to be less than significant.

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[7] *CARB Guide for Assessing and Mitigating Air Quality Impacts*, revised January 10, 2002, p. 29.

Table 5.4-8
Cumulative Impact Emission Totals

Subarea Name	ROG (tons/yr)	NOx (tons/yr)	CO (tons/yr)	PM10 (tons/yr)
Area Source Emissions				
T5327R – Genevieve Myers	0.87	0.36	0.29	0.00
T5738 – John Giumarra, Jr.	4.74	1.93	1.57	0.01
T5762R – R-M Development, Inc.	1.34	0.55	0.44	0.00
T5941 – Cemland Development	2.26	0.92	0.75	0.00
T6064 – Summerwind Group, Inc.	1.77	0.72	0.58	0.00
T6092 – Cemland Development	1.76	0.72	0.58	0.00
Panama 99 Properties, LLC	0.06	0.71	0.33	0.00
Totals	*12.8*	*5.91*	*4.54*	*0.01*
Vehicular Source Emissions				
T5327R – Genevieve Myers	3.45	5.03	28.98	0.19
T5738 – John Giumarra, Jr.	16.6	23.8	137	0.92
T5762R – R-M Development, Inc.	5.14	7.47	43.0	0.29
T5941 – Cemland Development	8.33	12.0	69.4	0.47
T6064 – Summerwind Group, Inc.	6.64	9.62	55.4	0.37
T6092 – Cemland Development	6.60	9.57	55.1	0.37
Panama 99 Properties, LLC	10.4	30.9	105	1.24
Totals	*57.2*	*98.4*	*494*	*3.85*
Cumulative Total	70.0	104	498	3.86

Cumulative operational impacts associated with the Project are also expected to be less than significant. For the most part, the cumulative vehicular emissions from the Project would not occur at the site, but would be distributed throughout an area surrounding the Project site. This would minimize the impact from the vehicular sources due to the large area in which the pollutants are emitted and the mixing that traffic creates. Overall, cumulative impacts are expected to be less than the CAAQS and, therefore, would be considered less than significant.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

SHORT-TERM EMISSIONS

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5.4-1a The following mitigation measures shall be utilized during the construction phase of the Project to reduce construction exhaust emissions:

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LOCALIZED CO EMISSIONS

5.4-3 No mitigation measures are recommended.

CONFORMITY WITH AIR QUALITY MANAGEMENT PLAN

5.4-4 No mitigation measures are recommended.

CUMULATIVE IMPACTS

5.4-5 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

ROG and NOx emissions from Project operations would remain significant and unavoidable following mitigation.

If the City of Bakersfield approves the Project, the City would be required to cite their findings in accordance with Section 15091 of the CEQA Guidelines and prepare a Statement of Overriding Considerations in accordance with Section 15093 of the CEQA Guidelines.

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Attachment 2

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TABLE OF CONTENTS >

Lung Cancer, Cardiopulmonary Mortality, and Long-term Exposure to Fine Particulate Air Pollution

C. Arden Pope III, PhD; Richard T. Burnett, PhD; Michael J. Thun, MD; Eugenia E. Calle, PhD; Daniel Krewski, PhD; Kazuhiko Ito, PhD; George D. Thurston, ScD

JAMA. 2002;287:1132-1141.

ABSTRACT

Context Associations have been found between day-to-day particulate air pollution and increased risk of various adverse health outcomes, including cardiopulmonary mortality. However, studies of health effects of long-term particulate air pollution have been less conclusive.

Objective To assess the relationship between long-term exposure to fine particulate air pollution and all-cause, lung cancer, and cardiopulmonary mortality.

Design, Setting, and Participants Vital status and cause of death data were collected by the American Cancer Society as part of the Cancer Prevention II study, an ongoing prospective mortality study, which enrolled approximately 1.2 million adults in 1982. Participants completed a questionnaire detailing individual risk factor data (age, sex, race, weight, height, smoking history, education, marital status, diet, alcohol consumption, and occupational exposures). The risk factor data for approximately 500 000 adults were linked with air pollution data for metropolitan areas throughout the United States and combined with vital status and cause of death data through December 31, 1998.

01841

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Main Outcome Measure All-cause, lung cancer, and cardiopulmonary mortality.

Results Fine particulate and sulfur oxide–related pollution were associated with all-cause, lung cancer, and cardiopulmonary mortality. Each 10-μg/m^3 elevation in fine particulate air pollution was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively. Measures of coarse particle fraction and total suspended particles were not consistently associated with mortality.

Conclusion Long-term exposure to combustion-related fine particulate air pollution is an important environmental risk factor for cardiopulmonary and lung cancer mortality.

INTRODUCTION

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author Information
- References

Based on several severe air pollution events,[1-3] a temporal correlation between extremely high concentrations of particulate and sulfur oxide air pollution and acute increases in mortality was well established by the 1970s. Subsequently, epidemiological studies published between 1989 and 1996 reported health effects at unexpectedly low concentrations of particulate air pollution.[4] The convergence of data from these studies, while controversial,[5] prompted serious reconsideration of standards and health guidelines[6-10] and led to a long-term research program designed to analyze health-related effects due to particulate pollution.[11-13] In 1997, the Environmental Protection Agency adopted new ambient air quality standards that would impose regulatory limits on fine particles measuring less than 2.5 μm in diameter ($PM_{2.5}$). These new standards were challenged by industry groups, blocked by a federal appeals court, but ultimately upheld by the US Supreme Court.[14]

Although most of the recent epidemiological research has focused on effects of short-term exposures, several studies suggest that long-term exposure may be more important in terms of overall public health.[4] The new standards for long-term exposure to $PM_{2.5}$ were originally based primarily on 2 prospective cohort studies,[15-16] which evaluated the effects of long-term pollution exposure on mortality. Both of these studies have been subjected to much scrutiny,[5] including an extensive independent audit and reanalysis of the original data.[17] The larger of these 2 studies linked individual risk factor and vital status data with national ambient air pollution data.[16] Our analysis uses data from the larger study and (1) doubles the follow-up time to more than 16 years and triples the number of deaths; (2) substantially expands exposure data, including gaseous copollutant data and new $PM_{2.5}$ data, which have been collected since the promulgation of the new air quality standards; (3) improves control of occupational exposures; (4) incorporates dietary variables that account for total fat consumption, and consumption of vegetables, citrus, and high-fiber grains; and (5) uses recent advances in statistical modeling, including the incorporation of random effects and nonparametric spatial smoothing components in the Cox proportional hazards model.

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METHODS

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author information
- References

Study Population

The analysis is based on data collected by the American Cancer Society (ACS) as part of the Cancer Prevention Study II (CPS-II), an ongoing prospective mortality study of approximately 1.2 million adults.[18-19] Individual participants were enrolled by ACS volunteers in the fall of 1982. Participants resided in all 50 states, the District of Columbia, and Puerto Rico, and were generally friends, neighbors, or acquaintances of ACS volunteers. Enrollment was restricted to persons who were aged 30 years or older and who were members of households with at least 1 individual aged 45 years or older. Participants completed a confidential questionnaire, which included questions about age, sex, weight, height, smoking history, alcohol use, occupational exposures, diet, education, marital status, and other characteristics.

Vital status of study participants was ascertained by ACS volunteers in September of the following years: 1984, 1986, and 1988. Reported deaths were verified with death certificates. Subsequently, through December 31, 1998, vital status was ascertained through automated linkage of the CPS-II study population with the National Death Index.[19] Ascertainment of deaths was more than 98% complete for the period of 1982-1988 and 93% complete after 1988.[19] Death certificates or codes for cause of death were obtained for more than 98% of all known deaths. Cause of death was coded according to the *International Classification of Diseases, Ninth Revision (ICD-9)*. Although the CPS-II cohort included approximately 1.2 million participants with adequate questionnaire and cause-of-death data, our analysis was restricted to those participants who resided in US metropolitan areas with available pollution data. The actual size of the analytic cohort varied depending on the number of metropolitan areas for which pollution data were available. Table 1 provides the number of metropolitan areas and participants available for each source of pollution data.

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Table 1. Summary of Alternative Pollution Indices*

Air Pollution Exposure Estimates

Each participant was assigned a metropolitan area of residence based on address at time of enrollment and 3-digit ZIP code area.[20] Mean (SD) concentrations of air pollution for the metropolitan areas were compiled from various primary data sources (Table 1). Many of the particulate pollution indices, including $PM_{2.5}$, were available from data from the Inhalable Particle Monitoring Network for 1979-1983 and data from the National Aerometric Database for 1980-1981, periods just prior to or at the beginning of the follow-up period. An additional data source was the Environmental Protection Agency Aerometric Information

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Retrieval System (AIRS). The mean concentration of each pollutant from all available monitoring sites was calculated for each metropolitan area during the 1 to 2 years prior to enrollment.[17]

Additional information on ambient pollution during the follow-up period was extracted from the AIRS database as quarterly mean values for each routinely monitored pollutant for 1982 through 1998. All quarterly averages met summary criteria imposed by the Environmental Protection Agency and were based on observations made on at least 50% of the scheduled sampling days at each site. The quarterly mean values for all stations in each metropolitan area were calculated across the study years using daily average values for each pollutant except ozone. For ozone, daily 1-hour maximums were used and were calculated for the full year and for the third quarter only (ie, July, August, September). While gaseous pollutants generally had recorded data throughout the entire follow-up period of interest, the particulate matter monitoring protocol changed in the late 1980s from total suspended particles to particles measuring less than 10 μm in diameter (PM_{10}), resulting in the majority of total suspended particle data being available in the early to mid-1980s and PM_{10} data being mostly available in the early to mid-1990s.

As a consequence of the new $PM_{2.5}$ standard, a large number of sites began collecting $PM_{2.5}$ data in 1999. Daily $PM_{2.5}$ data were extracted from the AIRS database for 1999 and the first 3 quarters of 2000. For each site, quarterly averages for each of the 2 years were computed. The 4 quarters were averaged when at least 1 of the 2 corresponding quarters for each year had at least 50% of the sixth-day samples and at least 45 total sampling days available. Measurements were averaged first by site and then by metropolitan area. Although no network of $PM_{2.5}$ monitoring existed in the United States between the early 1980s and the late 1990s, the integrated average of $PM_{2.5}$ concentrations during the period was estimated by averaging the $PM_{2.5}$ concentration for early and later periods.

Mean sulfate concentrations for 1980-1981 were available for many cities based on data from the Inhalable Particle Monitoring Network and the National Aerometric Database. Recognizing that sulfate was artifactually overestimated due to glass fiber filters used at that time, season and region-specific adjustments were made.[17] Since few states analyzed particulate samples for sulfates after the early 1980s, individual states were directly contacted for data regarding filter use. Ion chromatography was used to analyze PM_{10} filters and this data could be obtained from metropolitan areas across the United States. Filters were collected for a single reference year (1990) in the middle of the 1982-1998 study period. The use of quartz filters virtually eliminated the historical overestimation of sulfate. Mean sulfate concentrations for 1990 were estimated using sulfate from AIRS, data reported directly from individual states, and analysis of archived filters.

Statistical Analysis

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The basic statistical approach used in this analysis is an extension of the standard Cox proportional hazards survival model,[21] which has been used for risk estimates of pollution-related mortality in previous longitudinal cohort studies.[15-16] The standard Cox model implicitly assumes that observations are statistically independent after controlling for available risk factors, resulting in 2

concerns with regard to risk estimates of pollution-related mortality.[22] First, if the assumption of statistical independence is not valid, the uncertainty in the risk estimates of pollution-related mortality may be misstated. Second, even after controlling for available risk factors, survival times of participants living in communities closer together may be more similar than participants living in communities farther apart, which results in spatial autocorrelation. If this spatial autocorrelation is due to missing or systematically mismeasured risk factors that are spatially correlated with air pollution, then the risk estimates of pollution-related mortality may be biased due to inadequate control of these factors. Therefore, in this analysis, the Cox proportional hazards model was extended by incorporating a spatial random-effects component, which provided accurate estimates of the uncertainty of effect estimates. The model also evaluated spatial autocorrelation and incorporated a nonparametric spatial smooth component (to account for unexplained spatial structure). A more detailed description of this modeling approach is provided elsewhere.[22]

The baseline analysis in this study estimated adjusted relative risk (RR) ratios for mortality by using a Cox proportional hazards model with inclusion of a metropolitan-based random-effects component. Model fitting involved a 2-stage process. In the first stage, survival data were modeled using the standard Cox proportional hazards model, including individual level covariates and indicator variables for each metropolitan area (without pollution variables). Output from stage 1 provided estimates of the metropolitan-specific logarithm of the RRs of mortality (relative to an arbitrary reference community), which were adjusted for individual risk factors. The correlation between these values, which was induced by using the same reference community, was then removed.[23] In the second stage, the estimates of adjusted metropolitan-specific health responses were related to fine particulate air pollution using a linear random-effects regression model.[24] The time variable used in the models was survival time from the date of enrollment. Survival times of participants who did not die were censored at the end of the study period. To control for age, sex, and race, all of the models were stratified by 1-year age categories, sex, and race (white vs other), which allowed each category to have its own baseline hazard. Models were estimated for all-cause mortality and for 3 separate mortality categories: cardiopulmonary (*ICD-9* 401-440 and 460-519), lung cancer (*ICD-9* 162), and all others.

Models were estimated separately for each of the 3 fine particle variables, $PM_{2.5}$ (1979-1983), $PM_{2.5}$ (1999-2000), and $PM_{2.5}$ (average). Individual level covariates were included in the models to adjust for various important individual risk factors. All of these variables were classified as either indicator (ie, yes/no, binary, dummy) variables or continuous variables. Variables used to control for tobacco smoke, for example, included both indicator and continuous variables. The smoking indicator variables included: current cigarette smoker, former cigarette smoker, and a pipe or cigar smoker only (all vs never smoking) along with indicator variables for starting smoking before or after age 18 years. The continuous smoking variables included: current smoker's years of smoking, current smoker's years of smoking squared, current smoker's cigarettes per day, current smoker's cigarettes per day squared, former smoker's years of smoking, former smoker's years of smoking squared, former smoker's cigarettes per day, former smoker's cigarettes per day squared, and the number of hours per day exposed to passive cigarette smoke.

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To control for education, 2 indicator variables, which indicated completion of high school or education beyond high school, were included. Marital status variables included indicator variables for single and other vs married. Both body mass index (BMI) values and BMI values squared were included as continuous variables. Indicator variables for beer, liquor, and wine drinkers and

nonresponders vs nondrinkers were included to adjust for alcohol consumption. Occupational exposure was controlled for using various indicator variables: regular occupational exposure to asbestos, chemicals/acids/solvents, coal or stone dusts, coal tar/pitch/asphalt, diesel engine exhaust, or formaldehyde, and additional indicator variables that indicated 9 different rankings of an occupational dirtiness index that has been developed and described elsewhere.[17, 25] Two diet indices that accounted for fat consumption and consumption of vegetables, citrus, and high-fiber grains were derived based on information given in the enrollment questionnaire.[18] Quintile indicator variables for each of these diet indices were also included in the models.[18]

In addition to the baseline analysis, several additional sets of analysis were conducted. First, to more fully evaluate the shape of the concentration-response function, a robust locally weighted regression smoother[26] (within the generalized additive model framework[27]) was used to estimate the relationship between particulate air pollution and mortality in the second stage of model fitting. Second, the sensitivity of the fine particle mortality risk estimates compared with alternative modeling approaches and assumptions was evaluated. Standard Cox proportional hazards models were fit to the data including particulate air pollution as a predictor of mortality and sequentially adding (in a controlled forward stepwise process) groups of variables to control for smoking, education, marital status, BMI, alcohol consumption, occupational exposures, and diet.

In addition, to evaluate the sensitivity of the estimated pollution effect while more aggressively controlling for spatial differences in mortality, a 2-dimensional term to account for spatial trends was added to the models and was estimated using a locally weighted regression smoother. The "span" parameter, which controls the complexity of the surface smooth, was set at 3 different settings to allow for increasingly aggressive fitting of the spatial structure. These included a default span of 50%, the span that resulted in the lowest unexplained variance in mortality rate between metropolitan areas, and the span that resulted in the strongest evidence (highest *P* value) to suggest no residual spatial structure. The risk estimates and SEs (and thus the confidence intervals) were estimated using generalized additive modeling[27] with S-Plus statistical software,[28] which provides unbiased effect estimates, but may underestimate SEs if there is significant spatial autocorrelation and significant correlations between air pollution and the smoothed surface of mortality. Therefore, evidence of spatial autocorrelation was carefully evaluated and tested using the Bartlett test.[29] The correlations of residual mortality with distance between metropolitan areas were graphically examined.

Analyses were also conducted of effect modification by age, sex, smoking status, occupational exposure, and education. Finally, models were fit using a variety of alternative pollution indices, including gaseous pollutants. Specifically, models were estimated separately for each of the pollution variables listed in Table 1, while also including all of the other risk factor variables.

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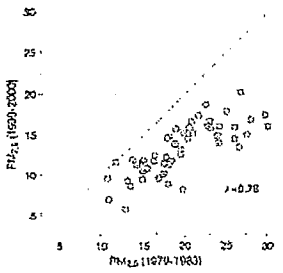
RESULTS

Jump to Section
- Top
- Introduction
- Methods

Fine particulate air pollution generally declined in the United States during the follow-up period of this study. Figure 1 plots mean $PM_{2.5}$ concentrations for 1999-2000 over mean $PM_{2.5}$ concentrations for 1979-

Results
• Comment
• Author information
• References

1983 for the 51 cities in which paired data were available. The concentrations of $PM_{2.5}$ were lower in 1999-2000 than in 1979-1983 for most cities, with the largest reduction observed in the cities with the highest concentrations of pollution during 1979-1983. Mean $PM_{2.5}$ levels in the 2 periods were highly correlated (r = 0.78). The rank ordering of cities by relative pollution levels remained nearly the same. Therefore, the relative levels of fine particle concentrations were similar whether based on measurements at the beginning of the study period, shortly following the study period, or an average of the 2.



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Figure 1. Mean Fine Particles Measuring Less Than 2.5 µm in Diameter ($PM_{2.5}$)

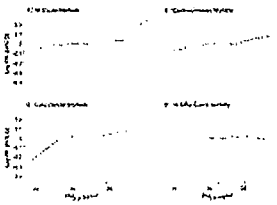
Mean $PM_{2.5}$ concentrations in micrograms per meters cubed for 1999-2000 are plotted along with concentrations for 1979-1983 for the 51 metropolitan areas with paired pollution data. The dotted line is a reference 45°-equality line.

As reported in Table 2, all 3 indices of fine particulate air pollution were associated with all-cause, cardiopulmonary, and lung cancer mortality, but not mortality from all other causes combined. Figure 2 presents the nonparametric smoothed exposure response relationships between cause-specific mortality and $PM_{2.5}$ (average). The log RRs for all-cause, cardiopulmonary, and lung cancer mortality increased across the gradient of fine particulate matter. Goodness-of-fit tests indicated that the associations were not significantly different from linear associations (P>.20).

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Table 2. Adjusted Mortality Relative Risk (RR) Associated With a 10-µg/m^3 Change in Fine Particles Measuring Less Than 2.5 µm in Diameter



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Figure 2. Nonparametric Smoothed Exposure Response Relationship

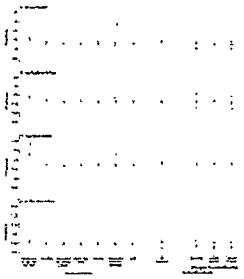
Vertical lines along x-axes indicate rug or frequency plot of mean fine particulate pollution; $PM_{2.5}$, mean fine particles measuring less than 2.5 µm in diameter; RR, relative risk; and CI, confidence interval.

The fine particle mortality RR ratios from various alternative modeling approaches and assumptions are presented in Figure 3. After controlling for smoking, education, and marital status, the controlled forward stepwise inclusion of additional covariates had little influence on the estimated associations with fine particulate air pollution on cardiopulmonary and lung cancer mortality. As expected, cigarette smoking was highly significantly associated with elevated risk of all-cause, cardiopulmonary, and lung cancer mortality ($P<.001$). Estimated RRs for an average current smoker (men and women combined, 22 cigarettes/day for 33.5 years, with initiation before age 18 years) were equal to 2.58, 2.89, and 14.80 for all-cause, cardiopulmonary, and lung cancer mortality, respectively. Statistically significant, but substantially smaller and less robust associations, were also observed for education, marital status, BMI, alcohol consumption, occupational exposure, and diet variables. Although many of these covariates were also statistically associated with mortality, the risk estimates of pollution-related mortality were not highly sensitive to the inclusion of these additional covariates.

Figure 3. Mortality Relative Risk (RR) Ratio Associated With 10-µg/m^3 Differences of $PM_{2.5}$ Concentrations

Data presented are for 1979-1983 for the different causes of death, with various levels of controlling for individual risk factors, and using alternative modeling approaches. The 3 models with spatial smoothing allow for increasingly aggressive fitting of the spatial structure. Plus sign indicates model included previous variables (ie, smoking included stratification by age, sex, and race); $PM_{2.5}$, mean fine particles measuring less than 2.5 µm in diameter; and CI, confidence interval.

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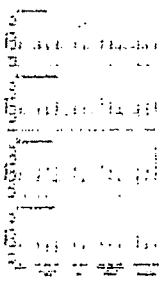
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Figure 3 also demonstrates that the introduction of the random-effects component to the model resulted in larger SEs of the estimates and, therefore, somewhat wider 95% confidence intervals. There was no evidence of statistically significant spatial autocorrelation in the survival data based on the Bartlett test ($P>.20$) after controlling for fine particulate air pollution and the various individual risk factors. Furthermore, graphical examination of the correlations of the residual mortality with distance between metropolitan areas did not reveal significant spatial autocorrelation (results not shown). Nevertheless, the incorporation of spatial smoothing was included to further investigate the robustness of the estimated particulate pollution effect. Effect estimates were not highly sensitive to the incorporation of spatial smoothing to account for regional clustering or other spatial patterns in the data.

Figure 4 presents fine particle air pollution–related mortality RR ratios after stratifying by age, sex, education, and smoking status, and adjusting for all other risk factors. The differences across age and sex strata were not generally consistent or statistically significant. However, a consistent pattern emerged from this stratified analysis: the association with particulate pollution was stronger for both cardiopulmonary and lung cancer mortality for participants with less education. Also, for both cardiopulmonary and lung cancer mortality, the RR estimates were higher for nonsmokers.

01849

Figure 4. Adjusted Mortality Relative Risk (RR) Ratio Associated With 10-μg/m^3 Differences of $PM_{2.5}$ Concentrations



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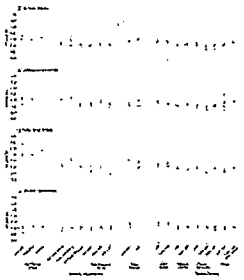
Data presented are for 1979-1983 for the different causes of death stratified by age, sex, education, and smoking status. $PM_{2.5}$ indicates mean fine particles measuring less than 2.5 μm in diameter; CI, confidence interval.

Figure 5 summarizes the associations between mortality risk and air pollutant concentrations listed in Table 1. Statistically significant and relatively consistent mortality associations existed for all measures of fine particulate exposure, including $PM_{2.5}$ and sulfate particles. Weaker less consistent mortality associations were observed with PM_{10} and PM_{15}. Measures of the coarse particle fraction ($PM_{15-2.5}$) and total suspended particles were not consistently associated with mortality. Of the gaseous pollutants, only sulfur dioxide was associated with elevated mortality risk. Interestingly, measures of $PM_{2.5}$ were associated with all-cause cardiopulmonary, and lung cancer mortality, but not with all other mortality. However, sulfur oxide pollution (as measured by sulfate particles and/or sulfur dioxide) was significantly associated with mortality from all other causes in addition to all-cause, cardiopulmonary, and lung cancer mortality.

Figure 5. Adjusted Mortality Relative Risk (RR) Ratio Evaluated at Subject-Weighted Mean Concentrations

$PM_{2.5}$ indicates particles measuring less than 2.5 μm in diameter; PM_{10}, particles measuring less than 10 μm in diameter; PM_{15}, particles measuring less than 15 μm in diameter; $PM_{15-2.5}$, particles measuring between 2.5 and 15 μm in diameter; and CI, confidence interval.

01850



View larger version (18K):
[in this window]
[in a new window]

COMMENT

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author information
- References

This study demonstrated associations between ambient fine particulate air pollution and elevated risks of both cardiopulmonary and lung cancer mortality. Each 10-μg/m^3 elevation in long-term average $PM_{2.5}$ ambient concentrations was associated with approximately a 4%, 6%, and 8% increased risk of all-cause, cardiopulmonary, and lung cancer mortality, respectively, although the magnitude of the effect somewhat depended on the time frame of pollution monitoring. In addition, this analysis addresses many of the important questions concerning the earlier, more limited analysis of the large CPS-II cohort, including the following issues.

First, does the apparent association between pollution and mortality persist with longer follow-up and as the cohort ages and dies? The present analysis more than doubled the follow-up time to more than 16 years, resulting in approximately triple the number of deaths, yet the associations between pollution and mortality persisted.

Second, can the association between fine particulate air pollution and increased cardiopulmonary and lung cancer mortality be due to inadequate control of important individual risk factors? After aggressively controlling for smoking, the estimated fine particulate pollution effect on mortality was remarkably robust. When the analysis was stratified by smoking status, the estimated pollution effect on both cardiopulmonary and lung cancer mortality was strongest for never smokers vs former or current smokers. This analysis also controlled for education, marital status, BMI, and alcohol consumption. This analysis used improved variables to control for occupational exposures and incorporated diet variables that accounted for total fat consumption, as well as for

01851

consumption of vegetables, citrus, and high-fiber grains. The mortality associations with fine particulate air pollution were largely unaffected by the inclusion of these individual risk factors in the models. The data on smoking and other individual risk factors, however, were obtained directly by questionnaire at time of enrollment and do not reflect changes that may have occurred following enrollment. The lack of risk factor follow-up data results in some misclassification of exposure, reduces the precision of control for risk factors, and constrains our ability to differentiate time dependency.

Third, are the associations between fine particulate air pollution and mortality due to regional or other spatial differences that are not adequately controlled for in the analysis? If there are unmeasured or inadequately modeled risk factors that are different across locations, then spatial clustering will occur. If this clustering is independent or random across metropolitan areas, then the spatial clustering can be modeled by adding a random-effects component to the Cox proportional hazards model as was done in our analysis. The clustering may not be independent or random across metropolitan areas due to inadequately measured or modeled risk factors (either individual or ecological). If these inadequately measured or modeled risk factors are also spatially correlated with air pollution, then biased pollution effects estimates may occur due to confounding. However, in this analysis, significant spatial autocorrelation was not observed after controlling for fine particulate air pollution and the various individual risk factors. Furthermore, to minimize any potential confounding bias, sensitivity analyses, which directly modeled spatial trends using nonparametric smoothing techniques, were conducted. A contribution of this analysis is that it included the incorporation of both random effects and nonparametric spatial smoothing components to the Cox proportional hazards model. Even after accounting for random effects across metropolitan areas and aggressively modeling a spatial structure that accounts for regional differences, the association between fine particulate air pollution and cardiopulmonary and lung cancer mortality persists.

Fourth, is mortality associated primarily with fine particulate air pollution or is mortality also associated with other measures of particulate air pollution, such as PM_{10}, total suspended particles, or with various gaseous pollutants? Elevated mortality risks were associated primarily with measures of fine particulate and sulfur oxide pollution. Coarse particles and gaseous pollutants, except for sulfur dioxide, were generally not significantly associated with elevated mortality risk.

Fifth, what is the shape of the concentration-response function? Within the range of pollution observed in this analysis, the concentration-response function appears to be monotonic and nearly linear. However, this does not preclude a leveling off (or even steepening) at much higher levels of air pollution.

Sixth, how large is the estimated mortality effect of exposure to fine particulate air pollution relative to other risk factors? A detailed description and interpretation of the many individual risk factors that are controlled for in the analysis goes well beyond the scope of this report. However, the mortality risk associated with cigarette smoking has been well documented using the CPS-II cohort.[16] The risk imposed by exposure to fine particulate air pollution is obviously much smaller than the risk of cigarette smoking. Another risk factor that has been well documented using the CPS-II cohort data is body mass as measured by BMI.[30] The Word Health Organization has categorized BMI values between 18.5-24.9 kg/m^2 as normal; 25-29.9 kg/m^2, grade 1 overweight; 30-39.9 kg/m^2, grade 2 overweight; and 40 kg/m^2 or higher, grade 3 overweight.[31] In the present analysis, BMI

01852

values and BMI values squared were included in the proportional hazards models. Consistent with previous ACS analysis,[30] BMI was significantly associated with mortality, optimal BMI was between approximately 23.5 and 24.9 kg/m^2, and the RR of mortality for different BMI values relative to the optimal were dependent on sex and smoking status. For example, the RRs associated with BMI values between 30.0 and 31.9 kg/m^2(vs optimal) would be up to approximately 1.33 for never smokers. Based on these calculations, mortality risks associated with fine particulate air pollution at levels found in more polluted US metropolitan areas are less than those associated with substantial obesity (grade 3 overweight), but comparable with the estimated effect of being moderately overweight (grade 1 to 2).

In conclusion, the findings of this study provide the strongest evidence to date that long-term exposure to fine particulate air pollution common to many metropolitan areas is an important risk factor for cardiopulmonary mortality. In addition, the large cohort and extended follow-up have provided an unprecedented opportunity to evaluate associations between air pollution and lung cancer mortality. Elevated fine particulate air pollution exposures were associated with significant increases in lung cancer mortality. Although potential effects of other unaccounted for factors cannot be excluded with certainty, the associations between fine particulate air pollution and lung cancer mortality, as well as cardiopulmonary mortality, are observed even after controlling for cigarette smoking, BMI, diet, occupational exposure, other individual risk factors, and after controlling for regional and other spatial differences.

AUTHOR INFORMATION

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author Information
- References

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01853

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Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author information
- References

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01856

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01857

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01858

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01859

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FULL TEXT

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01860

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ABSTRACT | FULL TEXT

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ABSTRACT | FULL TEXT

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01861

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TOMATIS
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01862

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FULL TEXT

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01863

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Vol. 290 No. 14, October 8, 2003

Original Contribution

TABLE OF CONTENTS >

Featured Link
- E-mail Alerts

Article Options
- Abstract
- PDF
- Send to a Friend
- Related articles in this issue
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- Asthma
- Allergy
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Association of Low-Level Ozone and Fine Particles With Respiratory Symptoms in Children With Asthma

Janneane F. Gent, PhD; Elizabeth W. Triche, PhD; Theodore R. Holford, PhD; Kathleen Belanger, PhD; Michael B. Bracken, PhD; William S. Beckett, MD; Brian P. Leaderer, PhD

JAMA. 2003;290:1859-1867.

ABSTRACT

Context Exposure to ozone and particulate matter of 2.5 μm or less ($PM_{2.5}$) in air at levels above current US Environmental Protection Agency (EPA) standards is a risk factor for respiratory symptoms in children with asthma.

Objective To examine simultaneous effects of ozone and $PM_{2.5}$ at levels below EPA standards on daily respiratory symptoms and rescue medication use among children with asthma.

Design, Setting, and Participants Daily respiratory symptoms and medication use were examined prospectively for 271 children younger than 12 years with physician-diagnosed, active asthma residing in southern New England. Exposure to ambient concentrations of ozone and $PM_{2.5}$ from April 1 through September 30, 2001, was assessed using ozone (peak 1-hour and 8-hour) and 24-hour $PM_{2.5}$. Logistic regression analyses using generalized estimating equations were performed separately for maintenance medication users (n = 130) and nonusers (n = 141). Associations between pollutants (adjusted for temperature, controlling for

01864

same- and previous-day levels) and respiratory symptoms and use of rescue medication were evaluated.

Main Outcome Measures Respiratory symptoms and rescue medication use recorded on calendars by subjects' mothers.

Results Mean (SD) levels were 59 (19) ppb (1-hour average) and 51 (16) ppb (8-hour average) for ozone and 13 (8) $\mu g/m^3$ for $PM_{2.5}$. In copollutant models, ozone level but not $PM_{2.5}$ was significantly associated with respiratory symptoms and rescue medication use among children using maintenance medication; a 50-ppb increase in 1-hour ozone was associated with increased likelihood of wheeze (by 35%) and chest tightness (by 47%). The highest levels of ozone (1-hour or 8-hour averages) were associated with increased shortness of breath and rescue medication use. No significant, exposure-dependent associations were observed for any outcome by any pollutant among children who did not use maintenance medication.

Conclusion Asthmatic children using maintenance medication are particularly vulnerable to ozone, controlling for exposure to fine particles, at levels below EPA standards.

INTRODUCTION

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author information
- References

Children with asthma are particularly vulnerable to the adverse health effects of high levels of **air pollution**. Studies of children with asthma living in some of the most highly polluted regions of the world conclude that exposure to levels of ozone or particulate matter (especially particles ≤2.5 µm in diameter [$PM_{2.5}$]) regularly in excess of US Environmental Protection Agency (EPA) air quality standards (120 ppb [1-hour average] and 80 ppb [8-hour average] for ozone and 65 $\mu g/m^3$ for 24-hour $PM_{2.5}$) significantly enhances the risk of respiratory symptoms, asthma medication use, and reduced lung function.[1-5]

Studies of children with asthma living in regions with levels of pollution within or near compliance with EPA air quality standards suggest that the current standards do not protect these more vulnerable members of the population.[6-10] Asthma severity, as measured by symptoms, medication use, restrictions in activity, or use of medical services, has been shown to be affected by exposure to ozone (1-hour maximum measurement[6-10] or 8-hour average[6-9]), particles 10 µm or smaller (PM_{10}),[6, 8] or $PM_{2.5}$ (12-hour total).[6]

Of interest in many recent studies of children with asthma are the simultaneous effects of ozone and particulates on asthma severity.[2-3,8] Simultaneous exposure to high levels of both ozone and $PM_{2.5}$ (fine particles)[2] or PM_{10}(coarse particles)[3] found in Mexico City, Mexico, contributed to increased respiratory symptoms among children with asthma. In a region of lower pollution, asthma symptoms were associated with both ozone and course particles.[8] In the current study, we examined the simultaneous

01865

effects of ozone and fine particles on daily respiratory symptoms and rescue medication use of children with asthma residing in southern New England during spring and summer 2001.

METHODS

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author Information
- References

Participants

The study participants were 271 children from a cohort of families living in Connecticut and the Springfield area of Massachusetts who were participating in a study of asthma development.[11,12] From 1997 through 1999, 1002 infants born to families with at least 1 child with physician-diagnosed asthma were enrolled in the original birth cohort. Beginning in 2000, eligible asthmatic siblings (1 per cohort family) were identified and invited to participate in a 1-year prospective study of asthma severity. Eligibility criteria were that the child was younger than 12 years at the time of enrollment and had exhibited respiratory symptoms or used asthma medication within the previous 12 months. Included in the current analysis are subjects enrolled for all or part of the 183-day sampling period (April 1 through September 30, 2001), which includes the summertime, high-ozone pollution months in this region. Of 357 children identified as being eligible for inclusion in the current analysis, 56 refused follow-up, 16 were lost to follow-up, and 14 withdrew before April 1, 2001, leaving a total of 271 (76%). The Human Investigation Committee of Yale University, New Haven, Conn, approved this study, and all respondents (mothers of study subjects) gave informed consent before participation.

Data Collection

Demographic information and medical histories were collected during a home interview with the mother at enrollment. Daily respiratory symptoms (wheeze, persistent cough, chest tightness, shortness of breath) and medication use (maintenance medications, including inhaled or systemic steroids, cromolyn sodium, and leukotriene inhibitors, and rescue medications, including bronchodilators) were recorded on symptom and medication calendars by the child's mother and collected through monthly telephone interviews. Additional information about the previous 12 months was collected at an exit interview (eg, dates the child had been away from the southern New England region during the study year).

Air Quality Assessment

Study subjects resided in a 6691-square mile area in Connecticut and the Springfield area of Massachusetts. All ambient air quality monitoring sites (14 sites for ozone, 10 in Connecticut and 4 in Massachusetts; 4 sites for daily $PM_{2.5}$, 2 in Connecticut and 2 in Massachusetts; 13 temperature sites, 12 in Connecticut and 1 in Massachusetts) were located within a 52.5-mile radius centered at Southington, Conn (14 miles southwest of Hartford). The maximum distance between sites was 105 miles; the minimum distance was 4 miles. The Departments of Environmental Protection (DEPs) of Connecticut and Massachusetts provided measurements for hourly ozone concentrations and temperatures and daily 24-hour $PM_{2.5}$ (total $PM_{2.5}$ accumulated during 24

01866

hours). Since both ozone and fine particle pollutants, as well as meteorological variables, tend to be regional,[13] the maximum daily 1-hour average (mean over 1 hour) and the 8-hour rolling average (mean over previous 8 hours) for ozone, daily $PM_{2.5}$ concentration, and maximum daily temperature were averaged across monitoring sites. Between-site correlation coefficients (Pearson *r*) were high for the 4 daily $PM_{2.5}$ sites (median $r = 0.91$; range, 0.84-0.95) and the 13 temperature sites (median $r = 0.97$; range, 0.85-0.99). There was more variability among the 14 ozone monitoring sites (median $r = 0.83$; range, 0.50-0.97 for the 1-hour average; and median $r = 0.81$; range, 0.47-0.97 for the 8-hour average). For technical details on ambient air quality monitoring, see the Web sites for the Connecticut DEP[14] and the Massachusetts DEP.[15]

Data Analysis

To examine the effects of ozone and $PM_{2.5}$ on children with different degrees of asthma severity, children were divided into 2 groups: those who used any maintenance medication during the 183-day observation period (n = 130) and those who did not (n = 141). Use of maintenance medication was used as a proxy for asthma severity to avoid using the outcome measures (respiratory symptoms and rescue medication use) in the assessment of severity. Logistic regression analyses, using generalized estimating equations (PROC GENMOD with AR1 autoregressive structure in SAS statistical software)[16-18] and adjusted for maximum daily temperature, were used to evaluate the association between levels of ozone and $PM_{2.5}$, with presence or absence of specific respiratory symptoms or rescue medication use. Using a repeated-measures technique permitted each subject to serve as his or her own control; therefore, personal variables (eg, race and other sociodemographic factors) that would not change during the study were not included in the models. Subgroup analysis, which included either 17 160 observations (an average of 132 days of data for 130 users of maintenance medication) or 19 035 observations (135 days for 141 nonusers of maintenance medication), focused directly on the association between exposures and health effects.

Exposure variables were categorized into quintiles, then entered into the model as dummy variables. The reference category for each was the lowest quintile. Both same-day and previous-day levels of ozone and $PM_{2.5}$ were examined. Analyses were performed separately for each severity group and each outcome. In single-pollutant models, a test for linear trend was performed by examining the model when the pollutant was entered as a continuous variable instead of as quintiles. In copollutant models, a test for goodness of fit was performed using the Hosmer-Lemeshow statistic for logistic regression. Significance level for all tests was set at .05.

RESULTS

Descriptive Statistics

Levels of ozone, $PM_{2.5}$, and temperature from April through September 2001 are summarized in Table 1 and Figure 1. The EPA 1-hour standard (120 ppb) was exceeded on 3 days, and the 8-hour ozone standard

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment

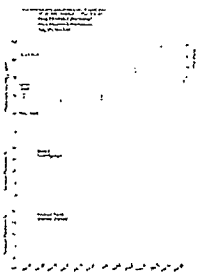
01867

• Author information
• References

(80 ppb) was exceeded on 10 days of the 183 days of observation. There were no days when the level of $PM_{2.5}$ exceeded the EPA 24-hour standard of 65 $\mu g/m^3$. There was a strong correlation between ozone and fine particles ($PM_{2.5}$ vs 1-hour average ozone $r = 0.77$ vs 8-hour average $r = 0.74$) (Table 2).

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Table 1. Ozone, Particulate Matter of 2.5 μm or Less ($PM_{2.5}$), and Temperature in Southern New England, April 1 to September 30, 2001



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Figure. Daily Levels of Ozone (Both 1-Hour Average and 8-Hour Average), Particulate Matter of 2.5 μm or Less ($PM_{2.5}$), and Daily Maximum Temperature, With Daily Prevalence of Respiratory Symptoms for Users of Asthma Maintenance Medication (n = 130) for Southern New England, April 1 through September 30, 2001

Dotted lines at 80 ppb and 120 ppb indicate Environmental Protection Agency standards for 8-hour average and 1-hour average ozone, respectively. Note that daily exposure levels shown here are the result of averaging over regional monitoring sites (14 ozone, 4 $PM_{2.5}$, and 13 temperature sites).

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Table 2. Pearson Correlation Coefficients for Same Day and Previous Day Levels of Ozone and Particulate Matter of 2.5 μm or Less ($PM_{2.5}$)

There were no significant differences between the users (n = 130) of maintenance medication and nonusers (n = 141) for mean (SD) age of study subjects (age on April 1, 2001, for users, 8.8 [2.0] years [range, 2.4-12.7 years]; age of nonusers, 8.3 [2.2] years [range, 2.0-12.6 years]; t test $P = .71$) or mean days of participation (mean participation for users, 132 [48] days [range, 3-183 days]; mean participation for nonusers, 135 [51] days [range, 5-183 days]; t test $P = .50$). Sex and ethnicity did not differ by medication use. Nearly two thirds of each group were male (users, 64.6%; nonusers, 64.5%; χ^2 test $P = .99$), and most

01868

children in each group were white, with smaller numbers of black and Hispanic children (users, 80.0%, 8.5%, and 11.5%, respectively; nonusers, 70.9%, 11.4%, and 17.7%, respectively; X^2 test $P = .22$). Compared with nonusers of maintenance medication, users had significantly more days of all respiratory symptoms and rescue medication use: 50% of this group experienced approximately 1 week of persistent cough or wheeze, had 2 to 3 days of chest tightness or shortness of breath, and used rescue medication for nearly 3 weeks during the 26-week study period. At least half of all nonusers experienced no symptoms and did not use rescue medication during this same period (Table 3). Daily prevalence of symptoms for users of maintenance medication is shown in Figure 1. With the exception of somewhat higher rates of symptoms in the early spring and late summer when the temperatures tended to be lowest, there was overall conformity of reporting all 4 symptoms across the observation period.

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Table 3. Rates of Respiratory Symptoms and Rescue Medication Use for Study Subjects Stratified by Use of Maintenance Medication (Southern New England, April 1-September 30, 2001)*

Single-Pollutant Models for Users of Maintenance Medication

Ozone (1-Hour Average). An ozone concentration of 51.6 ppb or higher (the top 3 quintiles of the distribution of the maximum 1-hour average) on the same day as the reported symptom was the only exposure variable associated with an increased likelihood of wheeze (by 16%, 16%, and 22%, respectively) (Table 4, model 1). A 4% increase in bronchodilator use was also associated with same-day levels of ozone (51.6-58.8 ppb) (Table 4, model 1). Previous-day levels of maximum 1-hour average ozone were associated with increased likelihoods of persistent cough (16% increase for levels ≥72.7 ppb), chest tightness (by 21%, 30%, and 37% for levels ≥51.6 ppb), and shortness of breath (by 22% and 30% for levels ≥58.9 ppb) (Table 4, Model 2). The effects of previous-day levels on chest tightness and shortness of breath were significant in an exposure-dependent way: for each 50-ppb increase in previous-day, 1-hour ozone levels, the likelihood of these symptoms increased by 26% (odds ratio [OR], 1.26; 95% confidence interval [CI], 1.0-1.48) and 22% (OR, 1.22; 95% CI, 1.02-1.45), respectively.

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Table 4. Odds Ratios From 6 Single-Pollutant Logistic Regression Models of Respiratory Symptoms or Rescue Medication Use of Maintenance Medication Users (n = 130) (Southern New England, April 1 to September 30, 2001)*

01869

Ozone (8-Hour Average). An ozone concentration of 63.3 ppb or higher, measured as the maximum 8-hour average on the same day as the reported symptom, was associated with a 30% increase in chest tightness (Table 4, model 3). Previous-day levels of 52.1 ppb or higher were associated with increased chest tightness, persistent cough, and shortness of breath (Table 4, model 4). As was the case with 1-hour ozone levels, the associations with the symptoms of chest tightness and shortness of

breath were exposure dependent: a 50-ppb increase in previous-day, 8-hour ozone level increased the likelihood of chest tightness (OR, 1.33; 95% CI, 1.09-1.62) and shortness of breath (OR, 1.30; 95% CI, 1.05-1.61).

$PM_{2.5}$. Increased likelihood of chest tightness was associated with same-day levels of $PM_{2.5}$ from 12.1 to 18.9 $\mu g/m^3$ (Table 4, model 5). Previous-day levels of 19.0 $\mu g/m^3$ or higher were associated with persistent cough, chest tightness, and shortness of breath (Table 4, model 6).

Copollutant Models for Users of Maintenance Medication

In logistic regression models of both ozone and fine particles for children taking maintenance medication, an increased likelihood of respiratory symptoms was associated with levels of ozone on the same day, previous day, or both; and increased bronchodilator use was associated with the highest level of same-day ozone. Neither respiratory symptoms nor bronchodilator use were associated with level of fine particles.

Ozone (1-Hour Average) and $PM_{2.5}$. Increased likelihood of wheeze was associated with same-day levels of 1-hour average ozone of 43.2 ppb or higher in an exposure-dependent manner (Table 5). When ozone is entered into this same model as a continuous variable, a 50-ppb increase in same-day ozone increases the likelihood of wheeze by 35% (OR, 1.35; 95% CI, 1.11-1.65). None of the exposure variables was associated with an increased likelihood of persistent cough, and only 1-hour average ozone levels between 43.2 and 51.5 ppb were associated with a decreased likelihood of cough (OR, 0.88; 95% CI, 0.78-0.99). The likelihood of chest tightness was significantly increased by same-day (≥58.9 ppb) and previous-day (≥51.6 ppb) levels of ozone in an exposure-dependent way. The likelihood of chest tightness increases by 47% (OR, 1.47; 95% CI, 1.18-1.84) for each 50-ppb increase in same-day levels of ozone, and by 42% (OR, 1.42; 95% CI, 1.14-1.78) for each 50-ppb increase in previous-day levels. Shortness of breath and ozone were similarly associated; likelihood of the symptom was increased by same-day levels of 72.7 ppb or higher and previous-day levels from 58.9 to 72.6 ppb (by 32%). Increased likelihood of bronchodilator use was associated with same-day levels of 72.7 ppb or higher (Table 5).

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Table 5. Odds Ratios From the Copollutant Logistic Regression Model for Same-Day and Previous-Day Levels of Ozone (1-Hour Average) and Particulate Matter of 2.5 μm or Less ($PM_{2.5}$) Related to Each Respiratory Symptom or Rescue Medication Use of Maintenance Medication Users (n = 130) (Southern New England, April 1 to September 30, 2001)*

01870

Ozone (8-Hour Average) and $PM^{2.5}$. For 8-hour average ozone levels, the likelihood of chest tightness was increased by same-day (OR, 1.64; 95% CI, 1.23-2.17) and previous-day (OR, 1.45; 95% CI, 1.10-1.92) levels of 63.3 ppb or higher. Shortness of breath was similarly associated; likelihood of the symptom was increased by same-day (OR, 1.45; 95% CI, 1.10-1.91) and

previous-day (OR, 1.31; 95% CI, 1.00-1.71) levels of 63.3 ppb or higher. As seen for the highest 1-hour ozone level, increased bronchodilator use was associated with same-day levels of 63.3 ppb or higher for 8-hour ozone measurements (OR, 1.09; 95% CI, 1.02-1.17).

Nonusers of Maintenance Medication

Single-Pollutant Models. Similar analyses for nonusers of maintenance medication revealed no significant associations among the top 3 concentration quintiles for the exposure variables and respiratory symptoms or bronchodilator use. For example, chest tightness was not significantly associated with same-day, 1-hour ozone levels of 72.7 ppb or higher (OR, 0.92; 95% CI, 0.68-1.25), same-day, 8-hour ozone levels of 63.3 ppb or higher (OR, 1.17; 95% CI, 0.72-1.92), or previous-day, 8-hour ozone levels of 63.3 ppb or higher (OR, 0.99; 95% CI, 0.74-1.35). The only significant association was an increased likelihood of wheeze (OR, 1.20; 95% CI, 1.00-1.43) in the presence of previous-day, 8-hour average ozone between 39.1 and 45.8 ppb (the second quintile).

Copollutant Models. For the children who were not users of asthma maintenance medication, neither fine particles nor 1-hour average ozone levels were associated with increased likelihoods of respiratory symptoms in copollutant models. Increased bronchodilator use was associated with previous-day fine particle concentrations between 9.0 and 12.0 $\mu g/m^3$ in the model with 1-hour ozone levels (Table 6) and with these same levels in the model with 8-hour ozone (OR, 1.30; 95% CI, 1.02-1.65). An increase in the likelihood of wheeze was associated with 8-hour ozone, but only for concentrations between 39.1 and 45.8 ppb on the same day (OR, 1.33; 95% CI, 1.00-1.77) or the previous day (OR, 1.31; 95% CI, 1.05-1.63) and between 52.1 and 63.2 ppb for same-day levels (OR, 1.35; 95% CI, 1.00-1.81).

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Table 6. Odds Ratios From the Copollutant Logistic Regression Model for Same-Day and Previous-Day Levels of Ozone (1-Hour Average) and Particulate Matter of 2.5 µm or Less ($PM_{2.5}$) Related to Respiratory Symptoms and Rescue Medication Use of Maintenance Medication Nonusers (n = 141) (Southern New England, April 1 to September 30, 2001)*

COMMENT

In models controlling for ambient fine particle concentration and typically at levels below EPA air quality standards, daily ambient ozone was found to be significantly associated with increased risk of respiratory symptoms and increased use of rescue medication among children with asthma severe enough to require maintenance medication. Study strengths include frequent telephone follow-up to collect information on daily calendar-recorded symptoms and medication use; absence of reporting bias between symptoms and

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author Information

01871

• References

regionally collected ambient air quality data; the use of both the maximum 1-hour average (sensitive to spikes in concentration) and 8-hour average (a measure of short-term, cumulative exposure) to assess daily ambient ozone levels; use of $PM_{2.5}$ levels measured daily; and examination of the simultaneous effects of ozone and $PM_{2.5}$ at levels near or below current EPA ambient standards. Our results contribute to the limited literature examining the simultaneous effects of ozone and suspended particles on daily respiratory symptoms for a sensitive subpopulation in models adjusted for daily temperature.

One potential limitation of the study is that ambient ozone and particle concentrations were represented as means over regional sites. For the 14 ozone sites on any particular day, the mean (SD) ratio of maximum to minimum reading was 1.70 (0.50), which is similar to the mean ratio of upper to lower limit of each quintile of the summer ozone distribution of 1.38 (0.30) from our study. This suggests that the analysis using quintiles of the ozone distribution captures the variability that exists in the study region. Variability among $PM_{2.5}$ sites was less, but a potential limitation is that there were only 4 sites with daily measurements. However, a comparison between readings from these 4 sites and readings from the 10 sites with $PM_{2.5}$ readings every 3 days revealed good agreement. For the 61 days all sites had in common, the 10-site mean (SD) was 13.8 (8.2) compared with 12.8 (7.7) $\mu g/m^3$ for the 4 sites, and the Pearson correlation was 0.97.

Another potential limitation is the lack of personal variables (eg, race) in the regression models. However, by taking advantage of the repeated measurements we had for each subject, we were able to use each subject as his or her own control. The sample of 271 children contributed 36 195 person-days of observations to the analyses. Our within-subjects analytic approach permitted a strong test of the associations between ambient **air pollution** and health outcomes, and personal variables, since they would not vary within subjects, could be excluded from the models.

In this study, we did not consider medical care utilization as an outcome. Since this was not a clinic-based study, we did not have access to records to confirm medical visit dates. However, medical records are not necessarily more objective than reports of symptoms and medication use, since a number of factors unrelated to symptom severity also influence utilization. Symptoms and medication use vary from day to day and may be a more sensitive indicator of the effects of daily changes in **air pollution** on respiratory health, since not all symptoms result in a physician visit.

In our copollutant models, ozone but not fine particles significantly predicted increased risk of respiratory symptoms and rescue medication use among children using asthma maintenance medication. We found an immediate (same-day) effect of ozone on wheeze (with the 1-hour ozone metric), chest tightness, and shortness of breath (with both the 1-hour and 8-hour ozone metrics). We also found that previous-day levels of ozone (both metrics) were significantly associated with increased risk of chest tightness and shortness of breath. Goodness-of-fit tests for copollutant models suggest that the models with significant findings (wheeze, chest tightness, and shortness of breath) are reasonably good fits to the data. There were no systematic patterns to the lack of fit for models for persistent cough and bronchodilator use. However, because of repeated measurements, observations were not independent in any of the models, which may affect the interpretation of the Hosmer-Lemeshow statistic. It is possible that the

01872

more frequently reported events of persistent cough and bronchodilator use may be associated with ambient **air pollution** in combination with other factors (eg, activity level) not included in the current study.

Effects of 1-hour ozone among children using asthma maintenance medication, especially the association of same-day ozone with wheeze and previous-day ozone with chest tightness, appear to be more exposure dependent than the effects of small particles. In copollutant models for wheeze and chest tightness, a 50-ppb increase in same-day, 1-hour ozone level increased the likelihood of wheeze by 35% and chest tightness by 47%. However, since particles and ozone were positively correlated, it is difficult to separate their effects in the copollutant models. In the single-pollutant model for chest tightness, a 50-ppb increase in previous-day levels of 1-hour ozone resulted in a 26% increase in the likelihood of having the symptom. When same-day levels of 1-hour ozone were added to the model, the likelihood of this symptom went up to 32%. In the copollutant model, a 50-ppb increase in previous-day, 1-hour ozone level increased the likelihood of chest tightness by 42%. Levels of $PM_{2.5}$ happened to be relatively low and never exceeded EPA standards for the duration of the study period, which likely contributed to the lack of significant particle effects observed in the copollutant models. For our region, an examination of the association between symptoms and particle levels in winter months when ozone is not a factor would help us better understand the role of exposure to small particles on respiratory health.

There is little doubt that children with asthma are especially vulnerable to high levels of **air pollution.** Among a group of asthmatic children (n = 71) living in Mexico City, where levels of ozone have regularly exceeded the EPA standard, multivariate regression analyses of same-day ambient **air pollution** and separate models of previous-day pollution all revealed significant effects of ozone and fine particles on the likelihood of cough (an increase of 8% for each 50-ppb increase in ozone on either the same day or previous day; an increase of 6% or 8% for each 10-$\mu g/m^3$ increase in $PM_{2.5}$ on the same day or previous day) and lower respiratory tract illness (by 7% for each pollutant on the same day or previous day).[2] The effects seen for $PM_{2.5}$ in Mexico City, but not in our study, could be explained by the large difference between the mean (SD) 24-hour concentration of $PM_{2.5}$ in Mexico City (85.7 [30.2] $\mu g/m^3$), which was above the EPA standard of 65 $\mu g/m^3$ and was well above the mean of 13.1 (7.9) $\mu g/m^3$ observed in the current study. In addition, the chemical composition of the fine particles in each region may be different.[2, 10] The larger effect of 1-hour ozone that we found could be explained in part by the fact that we stratified our analysis by asthma severity, thereby observing a consistent pattern of increased likelihood of some symptoms of more than 40% in the group with more severe disease and no significant effects among the group with less severe disease.

Our results are consistent with recent studies[7, 10] that suggest exposure to lower levels of ozone is associated with respiratory symptoms in children with asthma. Children with asthma who attended a week-long asthma summer camp (a total of 166 children during three 1-week periods compared with our 183-day observation period) in the Connecticut River Valley (the same geographic area as the current study) were exposed to levels of ozone somewhat higher than the current study (mean [SD] 1-hour average, 84 [38] ppb; range, 20-160 ppb). In single-pollutant models, daily levels of same-day ozone were significantly associated with increased chest symptoms, β-agonist use, and decreased lung function.[10] These associations did not change when same-day

01873

levels of sulfate (a primary constituent of $PM_{2.5}$ in this region) were added to the model. In a recent study[7] of 846 children with asthma living in 8 urban areas around the country, ozone at levels comparable to those observed in the current study (mean 8-hour average of 48 ppb compared with our mean of 51 ppb with <5% of the days exceeding the EPA standard of 80 ppb in both studies) was associated, in single-pollutant models, with morning respiratory symptoms (wheeze, cough, or chest tightness). Although the data were not shown, the authors of each study also noted that adding copollutants to their models did not appreciably confound the effect of ozone. Both studies concluded that ozone, even at levels lower than current EPA standards, is strongly associated with adverse respiratory health effects in children with asthma.

Previous environmental chamber studies[19-21] of adults with asthma exposed to ozone for 1 to a few hours have shown relatively little effect on symptoms or lung function. On the other hand, short-term exposure to elevated levels of ozone and particulates in outdoor air has been associated with reduced pulmonary function in otherwise healthy children.[1, 22-23] Our study of asthmatic children under ambient exposure conditions in areas of lower pollution suggests that the more prolonged exposures associated with summertime ozone produce a greater stimulus than chamber exposures, that asthmatic children are more susceptible than asthmatic adults, that effects are delayed and not captured by short-term chamber studies, or that coexposures to other unidentified constituents of ambient air enhance the response to ozone. A recent study supporting this view examined the impact of traffic-reducing changes in Atlanta, Ga, during the 1996 summer Olympic Games.[24] Significant reductions in ozone and particles were associated with significant reductions in acute asthma care events (physician, clinic, or hospital visits) among children aged 1 to 16 years. In analyses including days before, during, and after the Olympics, an increase in daily acute asthma events was associated with levels of 1-hour ozone concentrations beginning at 60 to 89 ppb. Our findings indicate that comparable levels were associated with an increased likelihood of wheeze (≥58.9 ppb), chest tightness (≥58.9 ppb), shortness of breath, and rescue medication use (≥72.7 ppb).

In our study, we defined 2 levels of asthma severity based on maintenance medication use. We reasoned that since we were examining the association of **air pollution** and symptoms, we did not want to use symptoms to define severity. Instead, we used maintenance medication as a proxy for disease severity even though medication use and symptoms will be related. Maintenance medication users had significantly more wheeze, persistent cough, chest tightness, and shortness of breath than the nonusers and used rescue medication significantly more often. Our results strongly suggest that this definition of asthma severity divides the group into 2 levels of vulnerability to **air pollution**.

Our study is a unique combination of a sample of asthmatic children with detailed symptom and medication use followed for a long period and well-measured daily ambient copollutants. These results add to others that suggest that, even at low levels of ambient ozone and controlling for ambient fine particle concentration, children with severe asthma are at a significantly increased risk of experiencing respiratory symptoms.

01874

AUTHOR INFORMATION

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author Information
- References

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01875

REFERENCES

Jump to Section
- Top
- Introduction
- Methods
- Results
- Comment
- Author Information
- References

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01878

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01879

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Research Article

Ambient Air Pollution and Atherosclerosis in Los Angeles

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- Introduction
- Materials and Methods
- Results
- Discussion

Abstract

Associations have been found between long-term exposure to ambient air pollution and cardiovascular morbidity and mortality. The contribution of air pollution to atherosclerosis that underlies many cardiovascular diseases has not been investigated. Animal data suggest that ambient particulate matter (PM) may contribute to atherogenesis. We used data on 798 participants from two clinical trials to investigate the association between atherosclerosis and long-term exposure to ambient PM up to 2.5 μm in aerodynamic diameter ($PM_{2.5}$). Baseline data included assessment of the carotid intima-media thickness (CIMT), a measure of subclinical atherosclerosis. We geocoded subjects' residential areas to assign annual mean concentrations of ambient $PM_{2.5}$. Exposure values were assigned from a $PM_{2.5}$ surface derived from a geostatistical model. Individually assigned annual mean $PM_{2.5}$ concentrations ranged from 5.2 to 26.9 μg/m^3 (mean, 20.3). For a cross-sectional exposure contrast of 10 μg/m^3 $PM_{2.5}$, CIMT increased by 5.9% (95% confidence interval, 1-11%). Adjustment for age reduced the coefficients, but further adjustment for covariates indicated robust estimates in the range of 3.9-4.3% (p-values, 0.05-0.1). Among older subjects (≥ 60 years of age), women, never smokers, and those reporting lipid-lowering treatment at baseline, the associations of $PM_{2.5}$ and CIMT were larger with the strongest associations in women ≥ 60 years of age (15.7%, 5.7-26.6%). These results represent the first epidemiologic evidence of an association between atherosclerosis and ambient air pollution. Given the leading role of cardiovascular disease as a cause of death and the large populations exposed to ambient $PM_{2.5}$, these findings may be important and need further confirmation. *Key words:* air pollution, atherosclerosis, particulate matter. *Environ Health Perspect* 113:201-206 (2005). doi:10.1289/ehp.7523 available via *http://dx.doi.org/* [Online 22 November 2004]

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01880

Introduction

A large body of epidemiologic evidence suggests associations between ambient air pollution and cardiovascular mortality and morbidity (Peters and Pope 2002; Pope et al. 2004). All of these studies focus on events occurring at a late stage of vascular disease processes. The impact of air pollution on the underlying preclinical conditions remains poorly understood.

We hypothesize that current levels of ambient particulate matter (PM) up to 2.5 μm in aerodynamic diameter ($PM_{2.5}$) may contribute to atherosclerosis, leading to subclinical anatomical changes that play a major role in cardiovascular morbidity and mortality later in life. Animal studies support our hypothesis by showing that inhalation of ambient PM promotes oxidative lung damage, including alveolar and systemic inflammatory responses (Becker et al. 1996; Dye et al. 2001; Fujii et al. 2002; Goto et al. 2004; Suwa et al. 2002; van Eeden et al. 2001).

We investigated the association between residential ambient $PM_{2.5}$ and carotid artery intima-media thickness (CIMT) using prerandomization baseline data from two recent clinical trials conducted in Los Angeles, California (Hodis et al. 2002). CIMT is a well-established quantitative measure of generalized atherosclerosis that correlates well with all of the major cardiovascular risk factors, with coronary artery atherosclerosis, and with clinical cardiovascular events (Mack et al. 2000). It is an established tool for investigating the contribution of long-term exposures such as smoking or passive smoking to subclinical stages of atherosclerosis at any given age (Diez-Roux et al. 1995; Howard et al. 1994, 1998). This is the first study to assess the association of atherosclerosis with air pollution.

Materials and Methods

Population and health assessment. We used baseline health data from two randomized, double-blind, placebo-controlled clinical trials conducted at the University of Southern California Atherosclerosis Research Unit (Hodis et al. 2002). The Vitamin E Atherosclerosis Progression Study (VEAPS) investigated the effects of vitamin E on the progression of atherosclerosis measured by CIMT. The B-Vitamin Atherosclerosis Intervention Trial (BVAIT) focused on the effect of vitamin B supplements on the progression of atherosclerosis (trial in progress). Baseline assessment in both trials included CIMT measured between 1998 and 2003 using the same standardized methods (Hodis et al. 2002; Selzer et al. 1994, 2001). Recruitment of volunteers occurred over the entire Los Angeles Basin, covering a geographic area of approximately 64,000 km^2.

Eligible subjects for the VEAPS trial ($n = 353$) were men and women ≥ 40 years of age with slightly increased LDL cholesterol (≥ 3.37 mmol/L) but with no clinical signs or symptoms of cardiovascular disease (CVD) (Hodis et al. 2002). Subjects with diabetes, diastolic blood pressure > 100 mm Hg, thyroid disease, serum creatinine > 0.065 mmol/L, life-threatening diseases, or high alcohol intake were excluded.

BVAIT ($n = 506$) had a similar design to that of VEAPS. Men and women > 40 years of age were prescreened to meet study criteria (fasting plasma homocysteine ≥ 8.5 μmol/L; postmenopausal for women; no evidence of diabetes, heart disease, stroke, or cancer). Subjects were excluded on the basis of any clinical signs or symptoms of CVD, diabetes or fasting serum glucose ≥ 140 mg/dL, triglyceride levels ≥ 150 mg/dL, serum creatinine > 1.6 mg/dL, high blood pressure,, untreated thyroid disease, life-threatening disease with prognosis < 5 years, or high alcohol intake.

Thus, our study included "healthy" subjects with biomarkers (elevated LDL cholesterol or homocysteine) that suggested an increased risk of future CVDs ($n = 859$). Fifty-eight subjects were excluded in the exposure assignment process because they lived outside the area with $PM_{2.5}$ data. Three subjects had missing data in at least one of the covariates used in the models. Our total sample consisted of 798 participants.

Health measures, including CIMT. Our main outcome of interest is CIMT. In both trials, high-resolution B-mode ultrasound images of the right common carotid artery were obtained before the intervention (baseline) with a 7.5-MHz linear array transducer attached to an ATL Ultramark-4 Plus Ultrasound System (Ultramark, Bothell, WA). We used this baseline CIMT measurement as the outcome. Details of this highly reproducible method are published (Hodis et al. 2002; Selzer et al. 1994, 2001). Blood pressure, height, and weight were measured with standard procedures.

The baseline questionnaires included an assessment of all major CVD risk factors and covariates, including clinical events, diet, use of prescription medications, physical activity, current and past smoking and passive smoking, and vitamin supplements. Age, education, and other sociodemographic factors were available for each subject. Fasting blood samples were also drawn for lipid measurements. Data used in our analyses were collected with the same tools in both trials.

Exposure assignment. To assess exposure we chose a novel approach derived from a geographic information system (GIS) and geostatistics. This method allows for assignment of long-term mean ambient concentrations of $PM_{2.5}$ to the ZIP code area of each subject's residential address (Künzli and Tager 2000). The resulting surface of $PM_{2.5}$ covered the entire Los Angeles metropolitan area. The surface is derived from a geostatistical model and data from 23 state and local district monitoring stations (during 2000). These monitors are located across the Los Angeles region to characterize urban levels of pollution. To assign exposure, $PM_{2.5}$ data were interpolated using a combination of a universal kriging model

01881

with a quadratic drift and a multiquadric radial basis function model (Bailey and Gatrell 1995; Burrough and McDonnell 1998). We averaged the two surfaces based on 25-m grid cells. Examination of errors from the universal model showed that > 50% of the study area had assigned values within 15% of monitored concentrations, whereas 67% were within 20%. The larger errors were on the periphery of our study area, where the density of study participants was the lowest. We linked the ZIP code centroids of each subject with the exposure surface through a geocoding database [Environmental Systems Research Institute (ESRI) 2004]. Figure 1 illustrates the $PM_{2.5}$ surface with the geolocated ZIP codes. Individually assigned $PM_{2.5}$ data had a range from 5.2 to 26.9 $\mu g/m^3$ (mean, 20.3), thus exceeding the range observed across 156 metropolitan areas used in the largest cohort study of air pollution and mortality (Pope et al. 2002). All models were implemented with ArcScript from ESRI (Redlands, CA).

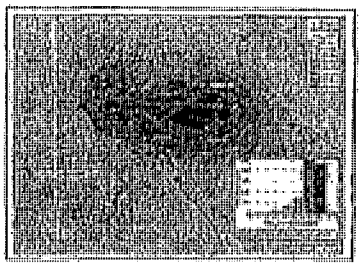


Figure 1. ZIP code locations of the study population geocoded on the $PM_{2.5}$ surface, modeled with 2000 $PM_{2.5}$ data, and distribution of individually assigned concentrations.

Statistical analyses. We tested the univariate and multivariate associations between CIMT and ambient $PM_{2.5}$ using linear regression analyses. Extensive residual diagnostics indicated some heteroskedasticity, which was rectified with the natural log-transformed CIMT. We adjusted for factors that were statistically associated with both CIMT and ambient $PM_{2.5}$ (age, male sex, low education, and low income). Next, we expanded the models using covariates that were associated with either $PM_{2.5}$ or CIMT, including indicator variables for current second-hand smoke exposure and current and former personal smoking. We then added covariates that play a role in atherosclerosis such as blood pressure, LDL cholesterol, or proxy measures such as reporting treatment with antihypertensives or lipid-lowering medications at study entry. These factors may affect the pathophysiologic pathways linking air pollution exposure and atherosclerosis (Ross 1999); thus, such models may overadjust the coefficients. We chose this conservative approach to test the sensitivity of the effect estimates under a broad range of model assumptions.

There is increasing evidence that host factors such as age, sex, or underlying disease and risk profiles may modify the effects of air pollution (Pope et al. 2002; Zanobetti and Schwartz 2002). Furthermore, the finding of atherosclerosis in PM-exposed rabbits was based on a hyperlipidemic trait (Suwa et al. 2002). Therefore, we also stratified by sex, age (< 60 years, ≥ 60 years), smoking status, and lipid-lowering drug therapy.

Results

Table 1 summarizes the main characteristics of the study population and among main subgroups. Table 2 presents the percent change in CIMT in association with a 10 $\mu g/m^3$ contrast in ambient $PM_{2.5}$ concentrations for three cross-sectional regression models. The unadjusted model indicates a 5.9% [95% confidence interval (CI), 1-11%] increase in CIMT per 10 $\mu g/m^3$ $PM_{2.5}$. For the observed contrast between lowest and highest exposure (20 $\mu g/m^3$ $PM_{2.5}$), this corresponds to a 12.1% (2.0-23.1%) increase in CIMT. The only covariate with a substantial effect on the point estimate was age, which reduced the effect from 5.9 to 4.3% (0.4-9%) per 10 $\mu g/m^3$ $PM_{2.5}$. This change agrees with the age-related effect modification. Otherwise, effect estimates across the models remained robust, in the range of 3.9-4.3% with *p*-values from 0.05 to 0.1. To corroborate the exposure-response relationship, we also categorized $PM_{2.5}$ levels into quartiles. Figure 2 shows the adjusted mean CIMT across these four groups of equal sample size at the mean levels of the covariates (age, sex, education, and income). The trend across the exposure groups was statistically significant ($p = 0.041$). The unadjusted means of CIMT among these quartiles of exposure were 734, 753, 758, and 774 µm, respectively.

Table 1.

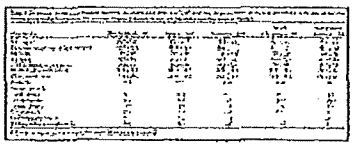
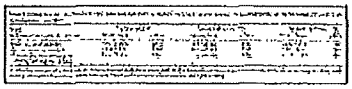
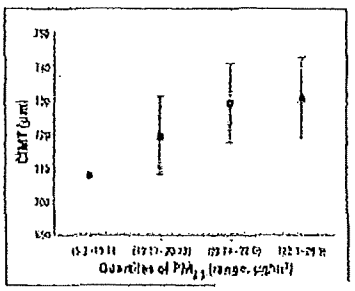


Table 2.





The associations between CIMT and $PM_{2.5}$ were substantially stronger among 109 subjects reporting lipid-lowering medication at study entry, both in men and in women (Table 2, Figure 3). The crude effect reached 15.8% (2-31%) per 10 $\mu g/m^3$ $PM_{2.5}$, with adjusted values ranging between 12 and 16%. Despite the small sample size, *p*-values of all models were mostly < 0.1 and often < 0.05.

Results also suggest significant age and sex interactions, with much larger effects in women and in the older age group (Figure 3). Effect estimates in

women were statistically significant and typically in the range of 6-9% per 10 $\mu g/m^3$ $PM_{2.5}$. Associations were strongest among women $\geq$ 60 years of age (n = 186), leading to crude estimates of 19.2% (9-31%). Adjusted coefficients ranged from 14 to 19%, being statistically significant in all models and sensitivity analyses.

Among never smokers (n = 502), the effect estimate reached 6.6% (1.0-12.3%). The estimate was small and not significant in current (n = 30) and former smokers (n = 265).

Figure 2. Mean CIMT ± 1 SE among quartiles of the $PM_{2.5}$ distribution. The y-axis shows mean CIMT levels at the population average of the adjustment covariates (age, sex, education, and income). The first quartile is the reference group.

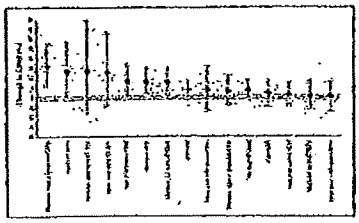


Figure 3. Percent difference and 95% CI in CIMT associated with a 10 $\mu g/m^3$ contrast in ambient $PM_{2.5}$ in all subjects and in subgroups. Lipid-LT, lipid-lowering therapy. All estimates are based on the cross-sectional linear model with log intima-media thickness as the dependent variable and home outdoor $PM_{2.5}$ as the independent variable, adjusted for sex, age, education, and income. Numbers in parentheses are numbers of subjects per group. Data are ordered by size of point estimate; the null effect line is indicated by a dash.

Discussion

Our study presents the first evidence for an association between CIMT and long-term exposure to ambient air pollution. As recently reviewed in a statement of the American Heart Association (Brook et al. 2004) substantial epidemiologic and experimental evidence suggests a contribution of ambient air pollutants on cardiovascular mortality and morbidity. However, these studies focus on acute and subacute effects on cardiac autonomic function, inflammatory or thrombogenic markers, arrhythmia, myocardial infarction, cardiovascular hospital admission, and death. The only outcome considered in long-term air pollution studies has been mortality. The relative risks for acute effects on mortality have been substantially smaller than those observed for long-term associations (Pope et al. 2002; Samet et al. 2000). As shown previously, cohort studies are capable of capturing acute and chronic effects of air pollution on the course of diseases that ultimately lead to premature death (Künzli et al. 2001). In contrast, time-series and panel studies investigate only the associations of event occurrence with the most recent exposure (Künzli et al. 2001). Thus, if air pollution has both acute and cumulative long-term effects, one expects larger mortality coefficients in cohort studies. CIMT reflects long-term past exposure; thus, we provide the first evidence for chronic effects of air pollution on atherogenesis that may in part explain the above mentioned discrepancy between acute and long-term risk estimates (Pope et al. 2002; Samet et al. 2000).

There are several major aspects to be considered in the interpretation of this new finding, mainly the strength in the exposure assignment, the limited evidence for bias, the differences in effects within subgroups, and plausibility.

Exposure assignment. The individual residence-based assignment of exposure represents a substantial improvement over most studies that have relied on central monitors or on binary road buffers combined with basic interpolation (Hoek et al. 2002; Pope et al. 2004). As a sensitivity analysis, we used weighted least-squares models with the weights specified as the inverse of the standard errors from the universal kriging model to down-weight estimates with larger error. In addition, we implemented models based solely on the universal kriging estimate. In both instances results were robust and similar to what we found with our main model.

Time-activity studies show that people spend most of their time in or around home, and our restriction of exposure assessment on residential address captures the most relevant part of exposure (Leech et al. 2002). $PM_{2.5}$ generally displays spatially homogeneous distributions across small areas such as neighborhoods and blocks, and as a result, the ambient conditions at the ZIP code centroid likely reflect the levels expected at home outdoors (Roosli et al. 2000). $PM_{2.5}$ of outdoor origin will also penetrate indoors, and correlations between long-term outdoor PM concentrations and indoor levels of PM from outdoor origin is high (Sarnat et al. 2000). Exposure to ambient air pollution while working and during commute are not included in our exposure term but are considered to be a relevant source of exposure (Riediker et al. 2003). Although most likely a random misclassification with biases toward the null, the errors may affect subgroups differently, thus explaining part of the observed interactions.

In Los Angeles, no clear trends have been observed in $PM_{2.5}$ concentrations over the past 5-10 years. The year 2000 surface characterizes the prevailing mean $PM_{2.5}$ concentrations across several years and can be considered a measure of long-term past exposure. This year also sits in the middle of the baseline recruitment period. Overall, the various limitations in our exposure assignment may add some random error, biasing results toward weaker associations (Thomas et al. 1993).

We also assigned ambient ozone to ZIP code centroids. Inclusion of ozone in the models had no impact on the $PM_{2.5}$ coefficients or the SEs. Ozone and $PM_{2.5}$ were not correlated (r = -0.17), and the $PM_{2.5}$ estimates were not substantially

different in low- and high-ozone regions. The estimates of association for ozone were positive but not statistically significant and much smaller than for $PM_{2.5}$. This finding must be put in context of the specific challenges in determining long-term exposure to ozone, which are substantially different than in the case of PM exposure. In contrast to $PM_{2.5}$ from outdoor origin, ambient ozone levels have lower correlations with personal exposure (Avol et al. 1998; Sarnat et al. 2000, 2002); therefore, the ability to detect effects of ozone will likely be reduced due to greater misclassification.

Biases. Our subjects were a nonrandom sample of "healthy" volunteers with above-average education, meeting strict inclusion criteria for the two clinical trials. Although we cannot exclude some systematic selection biases affecting the cross-sectional data, it is unlikely that subjects with preclinical signs of atherosclerosis would have been more likely to volunteer if they lived in more polluted areas. Although the selection of subjects limits the generalization to other populations, we do not expect this to lead to over- or underestimating the cross-sectional associations. The two trials recruited subjects independently; thus, the effects may be compared across trials to evaluate the potential influence of selecting volunteers. The populations differed with regard to age, smoking habits, baseline LDL and treatment, blood pressure, active and passive smoking, and other relevant factors; thus, the $PM_{2.5}$ coefficients were smaller and were not statistically significant in the VEAPS trial with its younger population. However, after taking these factors into account, the associations with ambient $PM_{2.5}$ were similar. For example, among elderly women of VEAPS ($n = 70$) and BVAIT ($n = 116$), the effect estimate was 18.1% (-0.1 to 36.3.%) and 13.6% (2.8-24.4.%), respectively. There is some evidence for larger effects in subjects with cardiovascular risk factors, indicated by prescriptions of lipid-lowering treatment. Our trials excluded subjects with clinically manifest CVDs. Moreover, if air pollution amplifies systemic inflammation among those prone to atherosclerosis, exclusion of subjects with high LDL may be a source of bias. One may expect effect estimates in a less selected, less healthy population to be larger than those reported.

The wealth of baseline data from these clinical trials offered the opportunity to control for a broad array of covariates. Apart from the effect of age adjustment, estimates were robust to numerous combinations of covariates, including income, education, active and passive tobacco smoke, cardiovascular prescriptions, vitamin intake, and physical activity. Uncontrolled or residual confounding appears to be an unlikely explanation for these results. Among women, adjustment for hormone replacement therapies did not affect the $PM_{2.5}$ estimates.

In previous studies, we found that spatial autocorrelation in the residuals could affect the size and significance of pollution coefficients (Jerrett et al. 2003a). We investigated spatial autocorrelation of the unstandardized residuals. We assessed autocorrelation with first-order, adjusted first-order, and second-order spatial weight matrices based on nearest neighbor contiguity, but we found no evidence of spatial autocorrelation. This supports the conclusion that the models supply efficient unbiased estimates (Jerrett et al. 2003b). As part of our sensitivity analyses, we also derived $PM_{2.5}$ surfaces using different interpolations and weighted least squares with weights equal to the inverse of the standard error of the exposure estimate. All approaches produced very similar results.

Evidence for effect modification. The data suggest substantial interactions with age, sex, smoking, and underlying cardiovascular risk factors. Given the reduced sample size among subgroups, the recruitment of volunteers, and the cross-sectional nature of the data, it is difficult to fully explore the causes of the observed modifications of associations and to establish susceptibility profiles. If the exposure misclassifications differed across subgroups, part of the interactions may be explained by differential exposure error. The sex and age difference could also be an artifact due to measurement error in the assigned exposure because time spent in commuting and location of work places may be different in men and women and in the young and elderly. Empirical studies on mobility suggest women have smaller activity spaces than men and younger groups, meaning they tend to spend more time in and around the home (Kwan and Lee 2004), and the same is probably true of the elderly compared with younger groups. Exposure measurement error may be reduced in those spending more time at home, leading to stronger effects (Thomas et al. 1993). Moreover, differences in statistical power may play a role as well; as shown at least for the 25-40-year age range, power to detect effects on CIMT is larger in women than in men (Stein et al. 2004).

The finding that those reporting prescriptions of lipid-lowering medications at baseline showed stronger associations of CIMT with $PM_{2.5}$ merits further investigation. This result agrees with the observed effects of PM on atherosclerosis in experiments conducted in hyperlipidemic rabbits (Goto et al. 2004; Suwa et al. 2002). The systemic inflammatory and atherogenic reaction in these rabbits was related to the amount of PM contained in the alveolar macrophages. In our study, being under lipid-lowering therapy is an indicator for risk profiles prone to atherogenesis. Those subjects were mostly men (64%) and, on average, older, more often active or passive smokers, and almost twice as likely to report antihypertensive treatment. The systemic response to ambient PM may amplify and expand the oxidation of LDL cholesterol among these susceptible subjects, consequently contributing to injury in the artery wall (Goto et al. 2004; Ross 1999). Investigations of short-term effects of ambient air pollution on mortality also suggest that underlying risk profiles such as diabetes may amplify susceptibility to ambient PM (Zanobetti and Schwartz 2002), and similar findings have been shown with smoking and diabetes mellitus in association with CIMT (Karim et al. 2005). To clarify the relevance of lipid status, it would be interesting to investigate our hypothesis among cohorts with familial hypercholesteremia (Wiegman et al. 2004; Wittekoek et al. 1999).

As shown in Figure 3, the size of the point estimate was larger among the older subjects. Future research needs to clarify whether air pollution contributes to atherosclerosis only after a certain age or early on. Effects of air pollution on lung development have been observed during adolescence and may be a result of both pulmonary and chronic systemic inflammatory effects (Gauderman et al. 2002); thus, it is conceivable that atherogenic responses may occur early in life. The age dependence of the effects may also be codetermined by genetic factors (Humphries and Morgan 2004; Ross 1999).

We also observed larger effects in women. If other cardiovascular risk factors such as occupational exposures dominate atherosclerosis in men, we would expect a smaller effect signal and less precision in the estimates among men. We also hypothesize that interactions may reflect biologic causes. If premenopausal women are protected against atherosclerosis by endogenous hormones, loss of hormonal protection would lead to increased vulnerability after menopause (Kannel et al. 1976). This could explain part of the interaction by both age and sex.

Active and passive smoking did not confound results in either the total sample or among subgroups. Adjustment for active tobacco smoke led to a slight increase in the effect estimate; thus, residual confounding is unlikely to overestimate the effects. However, $PM_{2.5}$ associations were clearly stronger in never smokers compared with smokers (data not shown). This gradient was also observed in all subgroups with significant $PM_{2.5}$ associations (Figure 3). Oxidative and inflammatory effects of smoking may dominate to such an extent that the additional exposure to ambient air pollutants may not further enhance effects along the same pathways. The difference in the effects of $PM_{2.5}$ in smokers and nonsmokers needs further investigation. The American Cancer Society cohort study does not reveal a clear pattern of a smoking interaction for the association of ambient air pollution and cardiovascular death (Krewski et al. 2004; Pope et al. 2004). In the Study on Air Pollution and Lung Diseases in Adults (SAPALDIA), associations between air pollution and level of pulmonary function did not differ by smoking status (Ackermann-Liebrich et al. 1997).

Some U.S. studies indicate effect modification of air pollution by socioeconomic status (SES) with much stronger effects among the less educated (Pope et al. 2002). The cause of this interaction pattern is not well understood. SES status was rather homogeneous in these mostly well-educated volunteers, providing little power to investigate interactions of pollution with SES. If lower SES also positively modifies effects of air pollution on atherosclerosis, our population would provide an underestimate of the health effects in the general population (O'Neill et al. 2003). Further research on samples representative of the population will be needed to assess whether the high SES in the clinical trials biases the effects toward the null.

Future research should focus on identifying factors that determine susceptibility to $PM_{2.5}$. We are initiating studies on subjects with inflammatory metabolic syndromes prone to accelerated atherosclerosis such as postmenopausal women, diabetics, or obese or physically inactive people. To corroborate the cross-sectional findings, follow-up studies are ultimately needed to investigate the association of concurrent levels of air pollution exposure with the progression of CIMT.

Plausibility. From a biologic perspective, our results support the hypothesis that long-term exposure to ambient PM contributes to systemic inflammatory pathways, which are a relevant aspect of atherogenesis (Ross 1999). The findings indicate a biologically plausible link between the observed acute effects of ambient air pollution on systemic inflammation (Glantz 2002) and the long-term consequences of sustained vascular inflammation leading to increased atherosclerosis and, ultimately, cardiovascular death (Hoek et al. 2002; Pope et al. 2004). Among susceptible people, this may lead to artery wall lesions similar to those observed in the rabbit model (Fujii et al. 2002; Suwa et al. 2002). In these hyperlipidemic rabbits, 4-week PM exposure was associated with the progression of atherosclerotic lesions, coupled with an enhanced release of bone marrow monocytes. These precursors of macrophages play an important role in the atherogenic inflammatory responses (Goto et al. 2004; Ross 1999; Suwa et al. 2002). Given the central role of oxidized LDL in the initiation and progression of atherogenesis, suggestions that the plasma of automotive workers with high exposure to traffic exhaust is more susceptible to oxidation is also of interest (Sharman et al. 2002).

As a quantitative plausibility check, we compared the size of the $PM_{2.5}$ effects with effects of other risk factors on CIMT. Using smoking and environmental tobacco smoke (ETS) as a model for air pollution exposure, the size of our estimates appear plausible (Diez-Roux et al. 1995; Howard et al. 1994). Associations of ETS and current levels of air pollution with various respiratory outcomes are similar and support the notion of common underlying pathways (Künzli 2002). Smoking and ETS associate with stiffer and thicker artery walls, reflecting the systemic effect of these exposures (Howard et al. 1994; Mack et al. 2003). Exposure to ETS was associated with 2-3% thicker intima-media, which approximate the effects observed for a 10 $\mu g/m^3$ change in $PM_{2.5}$ (Diez-Roux et al. 1995; Howard et al. 1994). Using never smokers without ETS exposure as the referent group in our data, never smokers with ETS at home had 0.9% (-2.7 to 4.5%) thicker artery walls; former smokers' CIMT was increased on average by 3.4% (0.7-6.3%), and the 30 current smokers had 5% (-1.5 to 11.6%) thicker CIMT. The trend across these four categories of tobacco exposure was statistically significant. As shown in Table 1, smokers were underrepresented in these volunteers of well-educated participants.

The observed percent change in CIMT corresponds to an increase in the thickness of approximately 20-40 μm per 10

01885

$\mu g/m^3$ contrast in $PM_{2.5}$. This difference in CIMT translates into some 3-6% increase in the long-term risk for myocardial infarction (O'Leary et al. 1999). Pope et al. (2004) reported that long-term exposure to $PM_{2.5}$ was associated with an 18% (14-23%) increase in ischemic heart disease. Effect sizes reported here concur with these findings, indicating that a fraction of the total effect of ambient PM on cardiovascular mortality may be mediated through sustained long-term effects of air pollution on atherosclerosis (Künzli et al. 2001). This is in line with the proposed model (Künzli et al. 2001) in which some of the effects observed in cohort studies must reflect long-term contributions of air pollution to the underlying disease progression, whereas in other cases, air pollution contributes only to triggering of cardiovascular events or death (Bell et al. 2004; Künzli et al. 2001; Peters and Pope 2002).

From a biologic and policy perspective, we emphasize that $PM_{2.5}$ probably serves as a surrogate for the mixture of urban air pollution and constituents of PM. It is premature to conclude that $PM_{2.5}$ and its constituents are the atherogenic culprit per se. Atherosclerosis results from complex processes that may include a combination of various urban pollutants, host factors, and pathways that ultimately lead to the findings of a CIMT-$PM_{2.5}$ association.

In conclusion, we have presented the first epidemiologic evidence supporting the idea of a chronic vascular response to respiratory and systemic effects of PM exposure. Given the leading role of heart disease as a cause of death in most westernized countries and the growing contribution in developing countries, these findings may be of high public health relevance. Further investigations need to focus on susceptible groups and follow-up of cohorts to investigate the effect of air pollution on the progression of CIMT.

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01886

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01887

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Last Updated: January 12, 2005

Response to Comments: Letter C

Herum\Crabtree\Suntag Attorneys Letter (May 20, 2019)

C-1: Caltrans, in conjunction with SJCOG, followed the Initial Study/Mitigated Negative Declaration (IS/MND) process to determine the need for an Environmental Impact Report (EIR). Prior to completion and public circulation of the IS/MND, Caltrans prepared various technical studies and conducted outreach events with the communities in the Project area and received valuable input regarding the design, potential concerns, and possible direct and indirect impacts of improving the existing interchange. Based on these studies and the input from the public, Caltrans determined that an IS/MND was the appropriate level of environmental document for this project. All technical studies were made available with the IS/MND during the public circulation period.

C-2: The proposed Project will improve an existing transportation facility in an urbanized portion of the City of Manteca and unincorporated San Joaquin County. The purpose of the Project is to reduce traffic congestion and improve operations along the interchange corridor. The environmental document prepared considers the most current general plans of each of these jurisdictions in analyzing potential direct and indirect impacts anticipated to occur. The Project would not promote urban decay, as the land surrounding the Project is already anticipated to be developed according to the land use and zoning designations of each jurisdiction. Because the Project would improve an already existing transportation facility, the Project will not change the location, rate, type, or amount of growth already anticipated to occur. Furthermore, the commenter discusses legal arguments concerning economic and social impacts; however, the commenter does not specifically state that inefficiencies on these topics exist in the environmental document.

C-3: Please refer to Response C-1 which explains why an IS/MND and not an EIR was prepared for this Project.

C-4: CEQA Guidelines Section 15126.2(a) only applies to EIRs. An EIR was not prepared for this Project. Please refer to Response C-1 which explains why an IS/MND and not an EIR was prepared for this Project.

Table 2-14 on page 95 of the IS/MND shows operational emissions under existing conditions and 2023 and 2043 for the no-build project and proposed project. Emissions decrease in 2023 and 2043 with the proposed project compared to the existing conditions mostly due to fleet turnover and improvements in exhaust controls. When the proposed Project is compared with the no-build project, the project would result in slight reductions in daily criteria pollutant emissions because of improved traffic flow, except for CO and particulate matter in 2043. The minor increase in daily CO emissions of 5.9 pounds per day is associated with the overall increase in traffic throughout the project area resulting from reconfiguration of the SR 99/SR 120

connector. The marginal increase in daily particulate matter emissions in 2043 (i.e., 1.2 pounds per day for PM10 and 0.5 pounds per day for PM2.5) is attributed to increases in brake and tire wear associated with the expanded capacity and annual average daily traffic count. This is not a significant increase in emissions when considered in context with total regional pollutant emissions. Caltrans will incorporate minimization measures AQ-1, AQ-2, and AQ-3 (refer to pages 98 and 99 of the IS/MND) to minimize impacts related to the slight emission increases due to Project implementation. Furthermore, implementation of the proposed Project would not create any potential localized air pollution "hot spots," and therefore would not have the potential to expose sensitive receptors to pollutant concentrations sufficient to warrant an evaluation of incrementally increased adverse health effects (IS/MND, pg. 96).

Based on Caltrans' studies, the IS/MND prepared for the Project concluded there would not be any significant and unavoidable environmental impacts, including those potentially related to air quality. The proposed project would not generate excessive pollutant emissions resulting in significant and unavoidable air quality impacts, and, therefore, analysis for potential public health concerns resulting from the incremental change in daily emissions was not required. The Project is funded through a conforming Regional Transportation Plan and underwent interagency consultation, in which the EPA determined on December 12, 2018, the Project was not a project of air quality concern (POAQC). (See IS/MND, Section 2.2.2, pg. 86, and Chapter 3, pg. 159; Air Quality Report, March 2019.)

C-5: Appendix F of the CEQA Guidelines only applies to EIRs. Please refer to Response C-1 which explains why an IS/MND and not an EIR was prepared for this Project.

Nevertheless, the environmental document does discuss the energy consumption issue and offers avoidance and minimization measures to reduce energy consumption during construction and operation of the Project. (Please refer to Section 3.3 Climate Change [IS/MND, pg. 207] of the environmental document where energy consumption analysis is discussed; additionally, Avoidance and Minimization Measure GHG-1 [IS/MND, pg. 226] addresses techniques to reduce energy use during construction and operation of the Project.)

C-6: While CEQA Guidelines Section 15064.7 does encourage public agencies to adopt thresholds of significance, it does not mandate they do so. In fact, Section 15064.4(b) states a lead agency should consider the following factors, among others, when determining the significance of impacts from GHG emissions on the environment:

1. *"The extent to which the project may increase or reduce GHG when compared to the existing environmental setting."*

    - As shown in Table 3-2 (IS/MND, pg. 217), the Project will lower CO_2 emissions (largest GHG contributor) by 1,666 metric tons per year at Design-Year 2043 when compared to the existing environmental setting. While the Project does have an increase of 3,748 metric tons per year at Construction-Year 2023 when compared to existing, it would reduce emissions by 5,043 metric tons per year when compared to the No-Build at Construction-Year 2023. Therefore, overall this Project has been determined to reduce GHG emissions when compared to the existing environmental setting. Furthermore, the project was determined to have less than significant impacts to air quality (IS/MND, pg. 167).

2. "*Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project.*"

    - In the absence of statewide-adopted thresholds or GHG emissions limits, Caltrans used the best available information, based, to the extent possible, on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions which may occur related to the proposed Project. Caltrans developed scenarios to assist with the determination of significance for GHG emissions for projects on the state highway system. Scenarios in which the future build GHG emissions are lower than existing emissions are generally considered to be less than significant. Scenarios where the future build GHG emissions are higher than existing emissions are generally considered to be significant. As shown in Table 3-2 on page 217 of the IS/MND, GHG emissions are reduced by 1,666 metric tons per year at Design-Year 2043 when compared to the existing setting. Both Design-Year no-build and build GHG emissions are lower than existing conditions; however, Design-Year build emissions are greater than future no-build emissions by 357 metric tons per year. Because there is a reduction in future emissions with the Project compared to existing emissions, there is still evidence of substantial progress in reducing emissions even with the minimal increase over future no-build emissions. Impacts to GHG emissions are considered to be less than significant. (See IS/MND, Section 3.3, pg. 222)

3. *"The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions (see, e.g., section 15183.5(b)). […] In determining the significance of impacts, the lead*

agency may consider a project's consistency with the State's long-term climate goals or strategies, provided that substantial evidence supports the agency's analysis of how those goals or strategies address the project's incremental contribution to climate change and its conclusion that the project's incremental contribution is not cumulatively considerable."

- The proposed Project is consistent with statewide, regional, and Caltrans' goals and objectives related to GHG reduction (IS/MND, Greenhouse Gas Reduction Strategies pg. 222). The Project is listed in the SJCOG's 2018 Regional Transportation Plan / Sustainable Communities Strategy: "The proposed interchange improvement project is part of an overall regional strategy that is expected to meet or exceed the regional GHG reduction target of ten percent per capita by 2035 (compared to 2005 baseline)" (IS/MND, pg. 216). The Project includes relevant transportation strategies from California's 2017 Climate Change Scoping Plan for reducing GHG emissions by improving highway operations. All applicable GHG reduction measures identified in the SJCOG 2018 Sustainable Communities Strategy have been incorporated. The proposed Project is not anticipated to increase operational GHG emissions over the existing and complies with applicable plans for GHG reduction strategies. (See IS/MND, Section 2.2.2, pg. 86, and Chapter 3, pg. 159; Air Quality Report, March 2019.)

Operational emissions are shown in Table 3-2 on page 217 and construction emissions are shown on page 222 of the IS/MND. CEQA does not require that the emissions from individual projects be compared to 2020 and 2050 statewide emission reduction goals.

Mitigation measures, feasible for the proposed project, from the CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review (June 19, 2008) were reviewed for applicability to the Project and relevant measures were added to the avoidance, minimization and mitigation measures. (See IS/MND, Appendix C, pg. 249).

C-7: The proposed Project was included in the City of Manteca General Plan 2023 (See City of Manteca General Plan 2023, Figure 4.2 and Circulation Policy C-P-19). It is being built to accommodate growth anticipated and planned for by the 2023 General Plan. The analysis throughout the environmental document takes into consideration local and regional jurisdictions where potential direct and indirect impacts could occur. Implementation of the Project will accommodate anticipated local and regional growth that is already planned. This is specifically evident in Section 2.1.1.1 Existing and Future Land Uses (IS/MND, pg. 23) where discussions regarding

jurisdictional land uses and potential impacts from Project implementation are analyzed. (See IS/MND, pg. 193).

The City of Manteca 2040 General Plan is referenced and acknowledged in Section 2.1.1.1 Existing and Future Land Use (See IS/MND, pg. 23). The City of Manteca is currently updating their General Plan and they are expecting the 2040 General Plan Update and accompanying environmental document to be approved/certified by the end of March 2020. As the proposed Project is anticipated to be approved prior to the approval/certification of the 2040 General Plan Update, the Project's current design is consistent with current planning documents of the City. Per CEQA Guidelines Section 15125, it is appropriate that the base conditions analyzed in the environmental document considered information from the current City of Manteca General Plan.

CEQA Guidelines Section 15126.2(g), as referenced, does not exist, however Section 15126.2(e) relates to growth inducing impacts. This section of the CEQA Guidelines falls under Article 9, Contents of Environmental Impact Reports and does not apply to the project. Please refer to Response C-1 which explains why an IS/MND and not an EIR was prepared for this Project.

C-8: Per Table 2-8 (See IS/MND, pg. 71), the Level of Service (LOS) for the evening traffic at the eastbound and westbound SR120 ramps at Main Street would remain LOS F without improvements proposed by the Project. Avoidance and minimization measures TRA-8 and TRA-9 provide for widening as part of the project and will improve the LOS to D. LOS D is an acceptable level of service for both Caltrans and the City of Manteca for the future projected volumes.

The LOS at Yosemite Avenue and Austin Road is projected to be LOS E (in the PM peak hour) without additional improvements under Design Year 2043. The degradation of the LOS over the next 20 years is caused by the projected traffic growth generated by new development projects. These new development projects will require detailed traffic studies, under CEQA, when development applications are submitted in the City of Manteca, San Joaquin County, or the City of Ripon. Per the City of Manteca, San Joaquin County, and City of Ripon standards the lead agency will require traffic mitigation measures to improve this intersection to acceptable LOS D or better. Improving this intersection at this time is beyond the scope of the improvements to the 99/120 interchange.

Comment Letter D: Billy Betschart Letter (May 21, 2019)

Comment Letter D

May 21, 2019

Subject: Comments on proposed plan on Cal Trans Project to improve Route 99/State Route 120 Interchange.

To: Jennifer Lugo, Senior Environmental Specialist
From: Billy Betschart, major owner of the following two parcels:
#224 - 050 - 15
#224 - 050 - 17

2.1.2 Farmland
"The loss of important farmland due to implementation of the build alternative is negligible when compared to the total important farmland inventory of county and city"

Comments:

The loss is extensive to parcel #224 - 050 - 15 [7.58 acres or 11.3%] and parcel #224 - 050 - 17 [1.28 acres or 4.1%], for a total of 15.4% or 8.86 acres. A majority of this land is for the connector road. The connector road is not instrumental in adding an off-ramp lane for the 120 by-pass.
The connector road could take an alternative route along Betschart"s western boundary by extending Atherton Road to the south and then east to Austin Road. This route would have minimal disruption to flood and drip irrigation systems. The current proposed route would require installing a new flood and drip irrigation system which could be cost prohibitive.

D-1

AG - 2
"The Project contractor will reconstruct irrigation ditches and install pipelines on all agriculture parcels impacted during project construction to insure proper drainage and irrigation.

Comments:

The farming operation is an ongoing practice on a daily basis. During the growing season for almonds [February - September] water is applied by drip irrigation every seven to twelve days, depending on temperature. If water is not applied on a regular basis, the result would be loss of crop and trees. The new flood and drip systems must be put in place on a timely fashion to avoid financial loss. The flood irrigation system is imperative for frost protection and resupply the aquifer. If the aquifer is not resupplied, the water table will drop and the cost of pumping water will be elevated. To install the flood irrigation system properly, the almond trees must be removed and the land releveled. These project effects could be avoided by running your connector road along the western and southern edge of the Betschart property.

D-2

Figure 1-3
The map shows the entire project along with the connector road.

Comments:

The owners of the property and the operator of the orchard would like to see a plan of action on the orchard on how we will get access to what will be three parcel instead of one. The movement of farm machinery and large 18- wheel trucks during harvest is necessary to continue farming the orchard. Farm machinery will always be moved from parcel to parcel and at times on a daily basis. Having the orchard divided into three parcel instead of one will significantly increase harvesting costs and all other farming operations. [spraying, application of fertilizer, mowing, weed control)

D-3

Parcel #224 - 050 -17
The map shows the connector road taking out six major barns used for hay storage, equipment storage, and feeder cattle. Your chart on Table 2-2 shows partial acquisition to this property, when in essence it will disrupt the entire use [business] for what buildings are being used.

In Conclusion:

The owners and operators of Parcels # 224 - 050 - 15 and #224 - 050 - 17 need detail information on proposed project inorder to plan for steps to be taken to continue to farm the almond orchard and to make adjustments for loss of buildings, if the project is to continue as planned. I have offered an alternative route to the connector road and ask that you will give serious consideration to this route.

D-4

Thank you,
Billy Betschart
209 - 629 - 2127o

Response to Comments: Letter D

Billy Betschart Letter (May 20, 2019)

D-1: The environmental document prepared for the proposed Project included analysis of important farmland loss required by the Farmland Protection Policy Act (FPPA). (See IS/MND, Section 2.1.2, pg. 28). A Community Impact Assessment Checklist (CIA Report) was prepared for the proposed Project and included analysis for the loss of farmland due to Project implementation. A Farmland Conversion Impact Rating for Corridor Projects (From NRCS-CPA-106) (See Appendix D in the CIA Report) was prepared to determine if the loss of farmland was significant under the FPPA. The FPPA states that lands that receive a combined score of less than 160 points on NRCS Form-CPA-106 are not subject to provisions of the FPPA. USDA recommends that sites receiving a total score of less than 160 need not be given further consideration for protection and no additional sites need to be evaluated. Therefore, as the Project received a rating of 136, no further consideration for protection or alternative sites is required under the FPPA.

Caltrans and SJCOG acknowledge potential hardships in the partial and full acquisition of privately-owned parcels for public projects as discussed in Appendix B Summary of Relocation Benefits of the environmental document. (See IS/MND, pg. 243.) The environmental document includes Avoidance and Minimization Measure AG-2 indicating that irrigation services will be reconstructed to ensure proper drainage and irrigation to affected parcels continues. Minimization Measure AG-2 has been revised to reflect timing with the addition of the following underlined text:

Mitigation Measure AG-2: Prior to the commencement of Project construction, the project contractor will reconstruct irrigation ditches and install irrigation pipelines on all agriculture parcels impacted during project construction to ensure proper drainage and irrigation.

D-2: Avoidance and Minimization Measures AG-1 and AG-2 have been included in the environmental document to maintain access and operation of adjacent agricultural properties and to reestablish irrigation and drainage infrastructure on parcels that are impacted by the Project. Assistance will be provided through the Caltrans Relocation Assistance Program, which requires affected property owners to be treated fairly and equitably. When the right-of-way acquisition process begins, Caltrans will work with the affected parcel owners to mitigate potential damages to the parcel and determine the fair market value of the acquisition.

D-3: The Project team met with the commenter on Wednesday June 5th, 2019**,** to provide further details about the Project and discuss concerns regarding partial acquisition of their parcel. The Project Team explained to the commenter that access across the new Woodward/Austin connector road will be allowed. Access can be provided by paved driveways and paved median

access. The exact locations of the crossings will be established during final design and in consultation/ coordination with the owner and operator. The Project team acknowledges that splitting the parcel can increase farming operations costs. The increased costs will be addressed during the right-of-way appraisal and acquisition phase.

D-4: The alignment to reconnect Austin Road to Moffat Boulevard was selected to minimize both the total right of way acquisition for all parcel owners and to minimize the out of direction travel required, which would be generated by eliminating the existing at-grade railroad crossing of Austin Road at the Union Pacific Railroad (UPRR) tracks. The alignment is consistent with the current 2011 Circulation Element of the City of Manteca General Plan (please refer to Figures 4.2 and 4.3 of the 2011 Circulation Element which shows the “connector” alignment, 2023 General Plan, pg. 4-17, 4-18). The new intersection location was selected because this is where the profile grade of the new structure crossing SR 99 and UPRR conforms near the elevation of the existing ground. The City of Manteca is currently updating their General Plan and they are expecting the 2040 General Plan Update and accompanying environmental document to be approved/certified by the end of March 2020. The east-west connection from Austin Road to the newly constructed extension of Atherton Drive has been discussed with the City of Manteca and may be considered in the 2040 General Plan Update. If the new connection is considered in the 2040 General Plan Update, then the Project would be revalidated to be consistent with the 2040 General Plan Update. As the proposed Project is anticipated to be approved prior to the approval/certification of the 2040 General Plan Update, the Project’s design as is, is consistent with current planning documents of the City.

Comment Letter E: Antionette A. Betschart Letter (May 20, 2019)

Comment Letter E

May 20, 2019

SUBJECT: Comments on INITIAL STUDY and NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION for STATE ROUTE 99/STATE ROUTE 120 INTERCHANGE IMPROVEMENT PROJECT

TO: Jennifer Lugo, Senior Environmental Specialist

FROM: Antoinette A. Betschart, Ph.D

As an owner of the Betschart property (APN 224-050-15) I am providing comments on behalf of the owners and agricultural operator regarding a) SR 99/SR 120 Interchange Improvement Project b) the negative impacts of the Project on our property and c) mitigation required, in our view, for continuous operation of the commercial almond orchard.

GENERAL CONCERNS - SR 99/SR 120 INTERCHANGE IMPROVEMENT PROJECT

PURPOSE: 1.2.1 p 2 "is to reduce traffic congestion and improve operations of the SR 99 with the SR 120 and Austin Road Interchanges."

Clearly SR 99/SR 120 must be expeditiously improved for all who use this interchange, eastbound and westbound. CONCERN: Why is only SR 120 eastbound to SR 99 southbound connector ramp being widened to two lanes in Phase IA? As the widening of SR 99 northbound to westbound SR 120 connector ramp isn't planned until Phase IB (2030-2031), current 2019 traffic on northbound 99 is typically congested and blocked daily for at least a mile, and funding is uncertain for Phase IB, it seems imperative that this should be included in Phase IA, the priority of the project.

E-1

SAFETY CONCERN - KEEP AUSTIN ROAD INTERCHANGE FULLY OPEN

For "Safety" of the community served by the Austin Road Interchange, i.e., rapid access and egress of emergency vehicles, and for business/commercial needs, on/off ramps of the Interchange must be kept open. Proposed Plan indicates that both southbound SR 99 exit ramp and northbound SR 99 entrance ramps to Austin Road will be closed Phase IA and IB, and not opened until Phase C (2030-2031) "if" funding is available. Thus, these two ramps will be either closed for 9 yrs or indefinitely if funding is not available. The Public Workshop (Aug., 2017) resulted in 11 separate requests indicating, in various ways, that it would be devastating for this community (N. & S. Austin Rd) to have closure of these ramps.

E-2

FARMLAND 2.1.2

Cover memo for Initial Study - Proposed Mitigated Negative Declaration, B. Boyles, Central Division Environmental North, CA Department of Transportation - "In addition, the project would have less than significant effects to farmlands, relocations/real property acquisition, environmental justice, utilities/emergency services, traffic/transportation....air quality..and cumulative impacts."

E-3

2.1.1.1 Existing and Future Land Use "No Avoidance, Minimization, and/or Mitigation Measures are required for project effects involving existing and future land use." p. 24 We take issue with this conclusion and the statement in the cover memo cited above regarding Farmland.

2.1.2 Farmland

"The Farmland Protection Policy Act (FPPA) sets criteria to identify and minimize impacts of the conversion of farmland to nonagricultural uses". p. 28

"Avoidance, Minimization, and/or Mitigation Measures" p 30

"The following avoidance and minimization measures would further reduce any project effects involving farmland:

AG-1 Final design of the project will be coordinated with neighboring property owners and agricultural operators to incorporate design features to maintain access and operation of adjacent agricultural properties.

AG-2 The Project Contractor will reconstruct irrigation ditches and install irrigation pipelines on all agriculture parcels impacted during project construction to ensure proper drainage and irrigation."

AG-3 Williamson Act Issues not applicable to Betschart property.

CONCERNS:

1) AG-1 addresses "neighboring" property owners and ag operators...to maintain access and operation of "adjacent agricultural properties". While this is very important, it is, CRITICAL to address "impacted" property owners and agricultural operators whose property infrastructure would be severely disrupted by Proposed Plan. Thus, AG-1 should include "impacted" property owners.

E-3
Con.

AG-1 Suggested Edit - Final design of the project will be coordinated with IMPACTED and neighboring property owners and agricultural operators to incorporate design features which allow CONTINUAL ACCESS by agricultural equipment essential for the commercial operation of IMPACTED agricultural properties.

NOTE: Present DOT proposed route for 'connector road' poses major access issues for the ag operators of the Betschart property since the contiguous property would be divided into three parcels. As commercial farm equipment must have continuous access to all three parcels, what is the plan for access across paved, county roads? Proposed Alternate Route #1(see below) for the 'connector road' would greatly improve the access issue, as the property/orchard would remain contiguous.

2) "AG-2 Project contractor will reconstruct irrigation ditches & install irrigation pipelines on all agriculture parcels impacted during project construction to ensure proper drainage and irrigation." To ensure continuous operation of commercial almond orchard, ALL INFRASTRUCTURE IMPACTED/DISRUPTED by the project must be relocated. Orchard needs to receive water every 7-12 days, depending on weather throughout the growing season.

AG-2 Suggested Edit - The project contractor will RELOCATE/RECONSTRUCT ALL INFRASTRUCTURE which will be IMPACTED/DISRUPTED by the project, including but not limited to well, irrigation ditches, irrigation pipelines, drip irrigation lines, valves, head gates, utilities...all essential for the continuous operation of the commercial almond orchard.

NOTE: THIS WORK MUST BE COMPLETED BEFORE ANY CONSTRUCTION BEGINS based on final design and location of widening Woodward Ave., widening Austin Road and proposed route of 'connector road' - Woodward Ave and Austin Road.

E-3 Con.

Above discussion is based upon DOT proposed route for the 'connector road'. IF route of 'connector road' and Woodward Ave roundabout were designed to "minimize impact of the conversion of farmland", the following proposed Alternate Route #1 would truly minimize impacts on the almond orchard/Betschart property.

Proposed Alternate Route #1- Run widened Woodward Ave over RR crossing to Moffat Blvd. Eliminate intrusion into Betschart orchard (~ 1+ acre) south of Woodward for a roundabout and shift Woodward roundabout intrusion into open property north of Woodward. Run Atherton Way south along western property line of Betschart almond orchard to southern property line and then east to Austin Road with appropriate curves to allow flow of traffic. The 'connector road' from Woodward would meet Austin Road slightly south of present DOT proposed plan. NOTE: A previous DOT plan proposed constructing Atherton Way south to Sudan, then east to Austin Road. Disruption, mitigation of drip irrigation lines, well, and other infrastructure would be minimal if Alternate Route #1 or previous DOT plan were adopted, compared to the current Proposed Plan.

E-4

Thus, this proposed Alternate Route near property lines for the 'connector road' would "minimize impacts on agricultural lands" and significantly decrease mitigation costs to reconstruct impacted/disrupted infrastructure.

SUMMARY

Given the above discussion and statements, we take exception to the adoption of this Initial Study and Proposed Mitigated Negative Declaration" in its current form. In our view, this Proposed Project has "significant negative impacts" on farmlands, including the property which we own, which have not been adequately addressed by Avoidance, Minimization and/or Mitigation Measures.

E-5

We look forward to further discussing the issues raised in this memo and those of my brother, Bill Betschart. In lieu of a public hearing, we request a meeting prior to release of the final Mitigated Negative Declaration with members of the design team at the site of our property, 2075 S Austin Rd, Manteca, CA. Our purpose is to more fully discuss the issues we have raised and options for proposed solutions in the context of walking the site. I look forward to hearing from you.

Antoinette A. Betschart

cell 510 502-1256

Response to Comments: Letter E

Antoinette A. Betschart Letter (May 21, 2019)

E-1: Construction of the project is being phased because construction funding is not currently available to construct all phases. Because of the limited funding, it has been recommended to improve the eastbound SR 120 to southbound SR 99 connector first. This connector has more congestion and a higher accident rate than the northbound SR 99 to westbound SR 120 connector. When Phase 1A is completed in 2023, the existing single lane northbound SR 99 to westbound SR 120 connector will operate at Level of Service (LOS) C as compared to LOS F as it exists today. (See IS/MND, Section 2.1.5, pg. 38.)

E-2: The August 2017 Public Workshop included only two options, full Austin Road interchange closure or full interchange replacement. Based on the public input and input from the Manteca and Ripon Fire Departments, the full interchange closure option was eliminated from consideration. A new option was developed to keep the Austin Road southbound on-ramp and northbound off-ramp open (a partial interchange) until the full interchange reconstruction can be funded.

E-3: Avoidance and Minimization Measure AG-1 is structured to allow communication between the project proponents and affected property owners to determine final design features that will be implemented and incorporated into the project to maintain access and operation of adjacent properties. Project proponents met with the commenter on Wednesday June 5, 2019, to discuss impacts specific to their parcel and continued access options. Access across the new Woodward/ Austin connector road will be allowed. Access will be provided by paved driveways and paved median access. The exact locations of the crossings will be established during final design and in consultation/ coordination with the owner and operator. The Project proponents acknowledge that splitting the parcel can increase farming operations costs. The increased costs are addressed during the right-of-way appraisal and acquisition phase.

Avoidance and Minimization Measure AG-2 is designed to be implemented on all agricultural parcels impacted during project construction. The way Avoidance and Minimization Measure AG-2 is written, it is inclusive of all agricultural parcels impacted during project construction. As such, this Avoidance and Minimization Measure covers potential impacts to the commenters parcel.

E-4: The alignment to reconnect Austin Road to Moffat Boulevard was selected to minimize both the total right of way acquisition for all parcel owners and to minimize the out of direction travel required, which would be generated by eliminating the existing at-grade railroad crossing of Austin Road at the Union Pacific Railroad (UPRR) tracks. The alignment is

consistent with the current 2011 Circulation Element of the City of Manteca General Plan (please refer to Figures 4.2 and 4.3 of the 2011 Circulation Element which shows the “connector” alignment, 2023 General Plan pg. 4-17, 4-18). The new intersection location was selected because this is where the profile grade of the new structure crossing SR 99 and UPRR conforms near the elevation of the existing ground. The City of Manteca is currently updating their General Plan and they are expecting the 2040 General Plan Update and accompanying environmental document to be approved/certified by the end of March 2020. The east-west connection from Austin Road to the newly constructed extension of Atherton Drive has been discussed with the City of Manteca and may be considered in the 2040 General Plan Update. If the new connection is considered in the 2040 General Plan Update, then the Project would be revalidated to be consistent with the 2040 General Plan Update. As the proposed Project is anticipated to be approved prior to the approval/certification of the 2040 General Plan Update, the Project’s design as is, is consistent with current planning documents of the City.

E-5: Please refer to Comment Responses E-1 through E-4 above.

Comment Letter F: California Department of Fish and Wildlife (May 25, 2019)

Comment Letter F

Chris Graham

To: Edward Heming
Subject: RE: SR 99/SR 120 interchange - City of Manteca/San Joaquin County

From: Lugo, Jennifer@DOT [mailto:jennifer.lugo@dot.ca.gov]
Sent: Saturday, May 25, 2019 6:39 PM
To: Azevedo, Jaycee A@DOT; Torres, Juan@DOT; Edward Heming
Cc: Padda, Jes S@DOT
Subject: Fwd: SR 99/SR 120 interchange - City of Manteca/San Joaquin County

Comment below.

Sent from my iPhone

Begin forwarded message:

From: "Gilmore, Suzanne@Wildlife" <Suzanne.Gilmore@wildlife.ca.gov>
Date: May 25, 2019 at 5:42:25 PM PDT
To: "Lugo, Jennifer@DOT" <jennifer.lugo@dot.ca.gov>
Cc: Wildlife R2 CEQA <R2CEQA@wildlife.ca.gov>, "Hulbert, Steven@Wildlife" <Steven.Hulbert@wildlife.ca.gov>
Subject: SR 99/SR 120 interchange - City of Manteca/San Joaquin County

The California Department of Fish and Wildlife (CDFW) appreciates the opportunity to comment on the Proposed Mitigated Negative Declaration (MND) for the State Route (SR) 99/SR 120 interchange project (Project). CDFW is responding to the MND as a Trustee Agency for fish and wildlife resources (California Fish and Game Code Sections 711.7 and 1802, and the California Environmental Quality Act [CEQA] Guidelines Section 15386), and as a Responsible Agency regarding any discretionary actions (CEQA Guidelines Section 15381), such as the issuance of a Lake or Streambed Alteration Agreement (California Fish and Game Code Sections 1600 et seq.) and/or a California Endangered Species Act (CESA) Permit for Incidental Take of Endangered, Threatened, and/or Candidate species (California Fish and Game Code Sections 2080 and 2080.1).

1. Lake and Streambed Alteration Agreement. Page 143 of the MND discusses the project area of approximately 326 acres includes and that no suitable drainage features within the project area would require a Streambed Alteration Agreement. This large area of acreage may include ephemeral drainages that may be appropriate for a Lake and Streambed Alteration Agreement (LSAA), pursuant to Section 1600 et seq. of the Fish and Game Code, for any activity that will divert or obstruct the natural flow, or change the bed, channel, or bank of a river, stream or lake, or use material from a streambed. If earth bottom drainage features will be modified, CDFW recommends consulting with staff regarding the assumption no LSAA would be necessary. Issuance of an LSAA is subject to the California Environmental Quality Act (CEQA). CDFW, as a responsible agency under CEQA, will consider the MND for the project. To obtain information about the LSAA notification process, please access our website at https://www.wildlife.ca.gov/Conservation/LSA

F-1

2. California Endangered Species Act. Page 155 provides a list of state laws and regulations relevant to wildlife impacts, however the California Endangered Species Act should be included. the MND proposes pre-construction surveys no less than 14 days before project activities and no mitigation measures for Swainson's hawk. CDFW

F-2

recommends that prior to any tree removal or Project related activities, the MND should require protocol-level surveys according to the Swainson's Hawk Technical Advisory Committee's (TAC) Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley, 1994. The MND should also include a description of the survey area, measures to replace the removal of mature nesting habitat, survey methodology and timing of each survey visit. CDFW recommends that the TAC survey method be strictly followed starting early in the nesting season in order to maximize the likelihood of detecting an active nest. Raptor nests may be very difficult to locate during egg-laying or incubation, or chick brooding periods (late April to early June) if earlier surveys have not been conducted. These full-season surveys may assist with Project planning, development of appropriate avoidance, minimization and mitigation measures, and may help avoid any pre construction Project delays.

F-2 Con.

Please note that if "take" or adverse impacts to Swainson's hawk, or any species listed under the California Endangered Species Act (CESA) cannot be avoided either during Project activities or over the life of the Project, a CESA permit must be obtained (pursuant to Fish and Game Code Section 2080 et seq.). Issuance of a CESA permit is subject to CEQA documentation; therefore, the CEQA document should specify impacts, mitigation measures, and a mitigation monitoring and reporting program. If the proposed Project will impact any CESA-listed species, early consultation is encouraged. More information on the CESA permitting process can be found on the CDFW website at https://www.wildlife.ca.gov/Conservation/CESA/ITP-Review-Standards

1. Wildlife Movement. Page 172 of the MND states that no impacts will occur to wildlife movement as a result of the Project. CDFW recommends incorporating survey data from sources such as the California Roadkill Observation System or camera data to establish scientific reasoning for the assumed absence of project impacts. To accommodate wildlife connectivity and in an effort to prevent wildlife and vehicle collisions, wildlife crossings should be considered as a component of mitigation where existing roadways will be upgraded and/or modified.

F-3

3. Inferences from Incomplete Data. Please note that the California Natural Diversity Database is only a positive occurrence database that is maintained through voluntary reporting. Therefore, extrapolation of CNDDB data to make conclusions regarding sensitive habitat types, species' distribution, numbers or density is likely not correct representative. Conclusions regarding the extent of a species' potentially present should only be made if supported by current and comprehensive survey information. Where field surveys have been completed, the ND should specify the protocols used and dates of surveys performed.

F-4

If you should have any questions regarding these comments, please contact me at Suzanne.gilmore@wildlife.ca.gov.

Regards,

Suzanne Gilmore
CDFW, North Central Region (2)
1701 Nimbus Road, Rancho Cordova CA 95670

Response to Comments: Letter F

California Department of Fish and Wildlife Email (May 25, 2019)

F-1: The aquatic features within the Project site do not fall under the definition of CDFW waters (i.e., CDFW regulates a stream or waterway with a defined bed and bank). Therefore, an LSAA pursuant to Sections 1600-1616 of the California Fish and Game Code, is not required.

F-2: CESA has been added to the IS/MND as requested. (See IS/MND, pg. 145.)

It is acknowledged that protocol-level surveys for Swainson's hawk would provide clarity for nesting activity within and in the vicinity of the Project site. However, implementation of Avoidance and Minimization Measure BIO-4 is sufficient to prevent "take" of this species. The applicant acknowledges the risks to the Project schedule if nesting Swainson's hawk are identified prior to construction. Therefore, no CESA take permit per the California Fish and Game Code is required.

F-3: The Project will have no additional affect to wildlife movement as the Project is a reconfiguration of an existing roadway facility. While the Project will not remove any existing wildlife barriers, the new configuration will not create any additional wildlife movement barriers. Additionally, the Project is located near an urban center and the nearest migration corridor (San Joaquin River) is located approximately 5 miles to the west.

F-4: The Natural Environment Study (NES), which is the technical report in support of the biology section of the IS/MND, describes the protocols and surveys performed that informed the determinations made. (See NES, pg. 17.) All technical studies were made available during the public comment and agency review period.

Comment Letter G: Will Fassler Letter (Undated)

Comment Letter G

Jennifer.Lugo@dot.ca.gov.

Jennifer Lugo,
Senior Environmental Planner,
California Department of Transportation,
855 M Street, Suite 200,
Fresno, CA 93721.

RE: Comments on State Route 99/State Route 120 Interchange Improvement Project Documents

Dear Ms. Lugo:

I request a public hearing be held on this matter. G-1

During my review of State Route 99/State Route 120 Interchange Improvement Project documents I noted a number of items of concern.

The location of the Woodward Avenue connection to Austin Road occurs too far north. According to expert comments at meetings on previous proposals, locating the connection further south connection of the would provide better much traffic flow over the proposed Austin Road overpass. G-2

The traffic study fails to address traffic congestion during non-peak hours. Currently, one slow truck on the northbound 99 to westbound 120 single-lane ramp can back up NB (northbound) 99 right-lane traffic to the Austin Road overpass in about one minute. Further, even weekend traffic on northbound 99 backs up about ¼ to 1/2 mile before the NB Austin off ramp. The slow trucks on the single-lane fly-over cause these backups. Project Phases 1A & 1B will not expand this fly-over to two lanes so it will continue to restrict traffic flow until Phase 1C gets completed. G-3

Until SR 120 widens to six lanes and SR 99 widens to eight lanes these single-lane choke points at the SR99/SR120 interchanges will continue to slow traffic flow to unacceptable levels.

To improve traffic flow over the Austin Road overpass the on-ramps and off-ramps need to be permanently closed. Otherwise, traffic flow over the overpass will get severely impeded long term.

Project funding remains unclear. Federal matching funds will soon become unavailable due to non-conforming air quality in the area. CalTrans needs to make clear if funds are actually budgeted, and from what sources.

Also, what impact will the project have on local transportation funds? How many years of local sales tax G-4

The first plans I am aware of for an Austin Road / SR 120 overpass reconstruction date back to 1964. Based upon the long history of repeated delays –due to lack of funding-- I seriously doubt

that Phases 1B or 1C will get funded and built. Again, the single-lane choke points will remain in place. The disruptions from construction will yield little benefit. G-4 Con.

I do not see any details for provisions to address traffic disruptions during project construction—aside from a boilerplate statement that "The project will be required to prepare and implement a Traffic
Management Plan to address short-term disruptions in existing
circulation patterns during construction; the Traffic Management
Plan will identify the locations of temporary detours and signage
to facilitate local traffic patterns and through-traffic
requirements.".

The low-traffic flow hours in the project area are few. The morning westbound commute traffic arrives at the project site by 4:15 a.m. The eastbound commuter traffic arrives at the site by 2 p.m. and often persists until 7:30 p.m. or later. In addition, even during non-peak hours the traffic on eastbound SR 120 often backs up to the Manteca South Main Street overpass. I feel the failure to identify and list at this time possible detours and alternate routes for through traffic constitutes a serious omission. G-5

The likely result of traffic disruptions from the proposed project construction will be exacerbated traffic congestion and increasing numbers of commuters flooding local streets in search of their own alternate routes. This effect will severely impact local traffic in Manteca, Lathrop, and Ripon.

The biological study missed the riparian brush rabbit. While the report states that the project area "lacks suitable habitat," within the last year I have seen riparian brush rabbit at night on a lawn in the neighborhood. Similarly, I sometimes see California Quail in the area. Again, despite the lack of "suitable habitat." These are also small foxes in the project area, but I am unable to identify them.

The biological survey appears incomplete.
Species I have seen occur in the area that do not appear in the Natural Environment Study Plant List
include
Gilia capitata, Orthocarpus purpurascens, and Lupinus bicolor. G-6

Orioles occur in the area (their nest remains are visible in some trees) but they do not appear on the birds list.
I have seen California Quail (Callipepla californica) in the project area.
I have also seen gray tree squirrels in the project area.

My years of insect collecting in the project area indicate the insect list omits entire families of insect taxa.

I look forward to your reply.

Regards,
Will Fassler

Response to Comments: Letter G

Will Fassler Email (Undated)

G-1: Caltrans and SJCOG contacted the commenter to set up a meeting with affected property owners in lieu of a public hearing. Commenter was agreeable and the Project team met with the property owners on Friday June 14, 2019, to discuss aspects of the Project and the concerns expressed by the commenter.

G-2: The new intersection location was selected for two reasons. First, this is the approximate location where the City of Manteca General Plan shows where East Woodward Avenue curves to meet Austin Road. Second, this is where the new roadway meets the existing ground, allowing the new intersection to be level and not on the slope created by crossing over the Union Pacific Railroad tracks. Because there is adequate sight distance and storage lengths for turn pockets at the proposed location, moving the intersection south would not improve the traffic operations. Moving the intersection south would require more right-of-way acquisition.

G-3: The traffic study evaluates the worst-case traffic flow for each section of highway, no matter when this period occurs, morning, evening, or mid-day. It does not address other periods of lesser traffic flow because traffic flows better during periods of lower traffic volumes.

The northbound (NB) 99 to westbound (WB) 120 ramp will be widened to two lanes in Phase 1B. When Phase 1A is completed in 2023, the existing single lane NB SR 99 to WB SR 120 connector will operate at Level of Service (LOS) C as compared to LOS F under existing conditions because temporarily removing the northbound Austin Road on-ramp reduces traffic conflicts. (See IS/MND, Section 1.4.1, pg. 10 and Section 2.1.5, pg. 38.).

Caltrans and SJCOG acknowledge that there will continue to be “choke points” until the SR 99 and SR 120 freeways are widened. Caltrans and SJCOG have begun preparation of studies to widen both SR 99 and SR 120; however, construction funding has not yet been identified.

Closure of the Austin Road ramps was considered and rejected because such a design was not supported by the public or by the Manteca and Ripon Fire Departments and is not consistent with the roadway network shown in the City of Manteca General Plan. The Austin Road freeway ramps will operate at an adequate level of service (See Table 2-8 in the IS/MND showing the projected intersection level of service). The project includes sufficient through and turn storage lanes to provide for the projected (planned) future traffic volumes.

G-4: Project funding has been committed for Phase 1A construction. Phase 1A will provide for an adequate 20 year level of service for the eastbound SR

120 to southbound SR 99 movement because this ramp is being widened to two lanes. Eastbound SR 120 will also function better because traffic will no longer be forced into the outside lane to use the connector to southbound SR 99. Both SR 120 lanes will have access to southbound SR 99. Phase 1A will provide for an adequate level of service for 10-years after construction for the single lane northbound SR 99 to westbound SR 120 movement because the temporary closure of the northbound Austin Road on-ramp eliminates traffic conflicts and allows a single lane ramp to work much better than it does today.

If Phase 1B is not implemented, Figure 2-7 of the IS/MND, shows the level of service will decrease to the unacceptable range in the 2043 design year and will become a choke point after 2033.Although no funding has been secured for Phases 1B and 1C, SJCOG will be submitting a funding request to proceed with Phase 1B and has a very strong desire to fund Phase 1B so that this work can be constructed no later than 2033 and not create a choke point as exists today.

G-5: Traffic management during construction is addressed during the development of detailed construction plans and specifications for the Project. This includes preparing detailed plans on when certain construction activities can occur, when lanes are closed to minimize impacts and preparing detour signage.

Detour routes were not specified in the environmental study because freeway traffic will not be detoured off the State Highway system except for a ¼ mile section of Moffat Boulevard that lies between the southbound Austin Road off-ramp and the southbound on-ramp. This detour along Moffat Boulevard will only be utilized during off peak hours and when the adjacent businesses are closed. Revisions have been made to the Project Description in the environmental document to include more details about construction detours and alternate routes (See IS/MND, Section 1.4.1, pg. 10).

Funding has been budgeted for a public outreach program to inform the public of upcoming construction activities so that the traveling public will be aware of any lane restrictions and detours. Caltrans has had great success with using the public outreach process to reduce traffic congestion in restricted work zones. During construction, the project will maintain the existing number of lanes during the highest traffic periods and will limit lane reductions or detours to off-peak hours. Traffic counts will be performed to establish the exact periods and which days when temporary lane closures can occur. These time/day periods will be determined about a year prior to the construction commencement date so that the analysis will recognize the current traffic conditions associated with each phase of construction. This will be done to minimize traffic impacts during construction.

G-6: In order to assess biological impacts (including impacts to special status and endangered species) a Natural Environment Study (NES) was prepared for the proposed Project. Table 3 of the NES (NES, pg. 29) provides a list of special status species and natural communities potentially occurring or known to occur in the Project area. Consistent with CDWF and USFWS requirements, it was determined that habitat suitable for this species does not occur within or near the project site, and, therefore, this species would not occur in this location. California Quail are not a special status species, and therefore are not included for analysis in the NES. Special status species of fox are not known to occur in the Project; and therefore, are not included for analysis in the NES.

The plant species the commenter references are not special status species; and therefore, are not included for analysis in the NES.

Grey tree squirrel does not have any special status or protections; as such, no additional analysis is required. For the bird species noted, Orioles and California quail do not have any special status associated with them. However, Orioles are considered migratory birds and are protected under Sections 3503 and 3513 of the California Fish and Game Code. Section 5.6 in the NES document (pg. 56) provides sufficient coverage and measures to protect these species during the nesting season.

The IS/MND includes a complete list of invertebrate species potentially occurring in the Project area based on CDFW and USFWS requirements (See IS/MND, Appendix D, pg. 261).

Comment Letter H: California State Clearinghouse Letter (May 29, 2019)

Comment Letter H

STATE OF CALIFORNIA

Governor's Office of Planning and Research

State Clearinghouse and Planning Unit

Gavin Newsom
Governor

Kate Gordon
Director

May 29, 2019

Jennifer Lugo
Caltrans 6 (Fresno)
855 M St, Suite 200
Fresno, CA 93721

Subject: State Route 99/State Route 120 Interchange Improvement Project
SCH#: 2019049145

Dear Jennifer Lugo:

The State Clearinghouse submitted the above named MND to selected state agencies for review. The review period closed on 5/28/2019, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act, please visit: https://ceqanet.opr.ca.gov/2019049145/2 for full details about your project.

H-1

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL 1-916-445-0613 state.clearinghouse@opr.ca.gov www.opr.ca.gov

Response to Comments: Letter H

California State Clearinghouse Letter (May 29, 2019)

H-1: The State Clearinghouse acknowledges that the lead agency has complied with the review requirements for draft environmental documents pursuant to the California Environmental Quality Act and indicates that no state agencies submitted comments during the April 26, 2019 to May 28, 2019 public review period.

Appendix A Title VI Policy Statement

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
PHONE (916) 654-6130
FAX (916) 653-5776
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

April 2018

NON-DISCRIMINATION
POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964, ensures *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."*

Related federal statutes and state law further those protections to include sex, disability, religion, sexual orientation, and age.

For information or guidance on how to file a complaint, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

To obtain this information in an alternate format such as Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone (916) 324-8379, TTY 711, email Title.VI@dot.ca.gov, or visit the website www.dot.ca.gov.

LAURIE BERMAN
Director

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

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Appendix B Summary of Relocation Benefits

California Department of Transportation Relocation Assistance Program
RELOCATION ASSISTANCE ADVISORY SERVICES

This appendix is general in nature and is not intended to be a complete statement of federal and state relocation laws and regulations. Any questions about relocation should be addressed to the Department's Division of Right of Way and Land Surveys. This section provides some general descriptive information on Public Law (PL) 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. This is often referred to simply as the "Uniform Act." The information in this appendix is provided only as background and is not intended as a complete statement of all the state or federal laws and regulations; for specific details the environmental planner should contact the Department's District or Regional Right-of-Way Relocation Branch. After presenting an outline of the basic legal foundation for relocation policy, the appendix looks at important relocation assistance information, including advisory services and the payment program. Refer to the Department's Right-of-Way Manual Chapter 10, for more detailed and specific information on relocation and housing programs.

DECLARATION OF POLICY

"The purpose of this title is to establish a ***uniform policy for fair and equitable treatment*** of persons displaced as a result of federal and federally assisted programs in order that such persons ***shall not suffer disproportionate injuries*** as a result of programs designed for the benefit of the public as a whole."

The Fifth Amendment to the U.S. Constitution states, "No Person shall…be deprived of life, liberty, or property, without due process of law, nor shall private property be taken for public use without just compensation." The Uniform Act sets forth in statute the due process that must be followed in Real Property acquisitions involving federal funds. Supplementing the Uniform Act is the government-wide single rule for all agencies to follow, set forth in 49 Code of Federal Regulations (CFR) Part 24. Displaced individuals, families, businesses, farms, and nonprofit organizations may be eligible for relocation advisory services and payments, as discussed below.

FAIR HOUSING

The Fair Housing Law (Title VIII of the Civil Rights Act of 1968) sets forth the policy of the United States to provide, within constitutional limitations, for fair housing. This act, and as amended, makes discriminatory practices in the

purchase and rental of most residential units illegal. Whenever possible, minority persons shall be given reasonable opportunities to relocate to any available housing regardless of neighborhood, as long as the replacement dwellings are decent, safe, and sanitary and are within their financial means. This policy, however, does not require the Department to provide a person a larger payment than is necessary to enable a person to relocate to a comparable replacement dwelling.

Any persons to be displaced will be assigned to a relocation advisor, who will work closely with each displacee in order to see that all payments and benefits are fully utilized and that all regulations are observed, thereby avoiding the possibility of displacees jeopardizing or forfeiting any of their benefits or payments. At the time of the initiation of negotiations (usually the first written offer to purchase), owner-occupants are given a detailed explanation of the state's relocation services. Tenant occupants of properties to be acquired are contacted soon after the initiation of negotiations and also are given a detailed explanation of the Caltrans Relocation Assistance Program. To avoid loss of possible benefits, no individual, family, business, farm, or nonprofit organization should commit to purchase or rent a replacement property without first contacting a Department relocation advisor.

RELOCATION ASSISTANCE ADVISORY SERVICES

In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, the Department will provide relocation advisory assistance to any person, business, farm, or nonprofit organization displaced as a result of the acquisition of real property for public use, so long as they are legally present in the United States. The Department will assist eligible displacees in obtaining comparable replacement housing by providing current and continuing information on the availability and prices of both houses for sale and rental units that are "decent, safe, and sanitary." Nonresidential displacees will receive information on comparable properties for lease or purchase (for business, farm, and nonprofit organization relocation services, see below).

Residential replacement dwellings will be in a location generally not less desirable than the displacement neighborhood at prices or rents within the financial ability of the individuals and families displaced, and reasonably accessible to their places of employment. Before any displacement occurs, comparable replacement dwellings will be offered to displacees that are open to all persons regardless of race, color, religion, sex, national origin, and consistent with the requirements of Title VIII of the Civil Rights Act of 1968. This assistance will also include the supplying of information concerning federal and state assisted housing programs and any other known services being offered by public and private agencies in the area.

Persons who are eligible for relocation payments and who are legally occupying the property required for the project will not be asked to move without first being given at least 90 days written notice. Residential occupants eligible for relocation payment(s) will not be required to move unless at least one comparable “decent, safe, and sanitary” replacement dwelling, available on the market, is offered to them by the Department.

RESIDENTIAL RELOCATION PAYMENTS

The Relocation Assistance Program will help eligible residential occupants by paying certain costs and expenses. These costs are limited to those necessary for or incidental to the purchase or rental of a replacement dwelling and actual reasonable moving expenses to a new location within 50 miles of the displacement property. Any actual moving costs in excess of the 50 miles are the responsibility of the displacee. The Residential Relocation Assistance Program can be summarized as follows:

Moving Costs

Any displaced person, who lawfully occupied the acquired property, regardless of the length of occupancy in the property acquired, will be eligible for reimbursement of moving costs. Displacees will receive either the actual reasonable costs involved in moving themselves and personal property up to a maximum of 50 miles, or a fixed payment based on a fixed moving cost schedule. Lawful occupants who move into the displacement property after the initiation of negotiations must wait until the Department obtains control of the property in order to be eligible for relocation payments.

Purchase Differential

In addition to moving and related expense payments, fully eligible homeowners may be entitled to payments for increased costs of replacement housing.

Homeowners who have owned and occupied their property for 90 days or more prior to the date of the initiation of negotiations (usually the first written offer to purchase the property), may qualify to receive a price differential payment and may qualify to receive reimbursement for certain nonrecurring costs incidental to the purchase of the replacement property. An interest differential payment is also available if the interest rate for the loan on the replacement dwelling is higher than the loan rate on the displacement dwelling, subject to certain limitations on reimbursement based upon the replacement property interest rate.

Rent Differential

Tenants and certain owner-occupants (based on length of ownership) who have occupied the property to be acquired by the Department prior to the date of the initiation of negotiations may qualify to receive a rent differential

payment. This payment is made when the Department determines that the cost to rent a comparable "decent, safe, and sanitary" replacement dwelling will be more than the present rent of the displacement dwelling. As an alternative, the tenant may qualify for a down payment benefit designed to assist in the purchase of a replacement property and the payment of certain costs incidental to the purchase, subject to certain limitations noted under the *Down Payment* section below. To receive any relocation benefits, the displaced person must buy or rent and occupy a "decent, safe and sanitary" replacement dwelling within one year from the date the Department takes legal possession of the property, or from the date the displacee vacates the displacement property, whichever is later.

Down Payment
The down payment option has been designed to aid owner-occupants of less than 90 days and tenants in legal occupancy prior to the Department's initiation of negotiations. The one-year eligibility period in which to purchase and occupy a "decent, safe and sanitary" replacement dwelling will apply.

Last Resort Housing
Federal regulations (49 CFR 24) contain the policy and procedure for implementing the Last Resort Housing Program on Federal-aid projects. Last Resort Housing benefits are, except for the amounts of payments and the methods in making them, the same as those benefits for standard residential relocation as explained above. Last Resort Housing has been designed primarily to cover situations where a displacee cannot be relocated because of lack of available comparable replacement housing, or when the anticipated replacement housing payments exceed the limits of the standard relocation procedure, because either the displacee lacks the financial ability or other valid circumstances.

After the initiation of negotiations, the Department will within a reasonable length of time, personally contact the displacees to gather important information, including the following:

- Number of people to be displaced.
- Specific arrangements needed to accommodate any family member(s) with special needs.
- Financial ability to relocate into comparable replacement dwelling which will adequately house all members of the family.
- Preferences in area of relocation.
- Location of employment or school.

NONRESIDENTIAL RELOCATION ASSISTANCE

The Nonresidential Relocation Assistance Program provides assistance to businesses, farms and nonprofit organizations in locating suitable

replacement property, and reimbursement for certain costs involved in relocation. The Relocation Advisory Assistance Program will provide current lists of properties offered for sale or rent, suitable for a particular business's specific relocation needs. The types of payments available to eligible businesses, farms, and nonprofit organizations are: searching and moving expenses, and possibly reestablishment expenses; or a fixed in lieu payment instead of any moving, searching and reestablishment expenses. The payment types can be summarized as follows:

Moving Expenses
Moving expenses may include the following actual, reasonable costs:

- The moving of inventory, machinery, equipment and similar business-related property, including: dismantling, disconnecting, crating, packing, loading, insuring, transporting, unloading, unpacking, and reconnecting of personal property. Items acquired in the right-of-way contract may not be moved under the Relocation Assistance Program. If the displacee buys an Item Pertaining to the Realty back at salvage value, the cost to move that item is borne by the displacee.
- Loss of tangible personal property provides payment for actual, direct loss of personal property that the owner is permitted not to move.
- Expenses related to searching for a new business site, up to $2,500, for reasonable expenses actually incurred.

Reestablishment Expenses
Reestablishment expenses related to the operation of the business at the new location, up to $25,000 for reasonable expenses actually incurred.

Fixed In Lieu Payment
A fixed payment in lieu of moving, searching, and reestablishment payments may be available to businesses that meet certain eligibility requirements. This payment is an amount equal to half the average annual net earnings for the last two taxable years prior to the relocation and may not be less than $1,000 nor more than $40,000.

ADDITIONAL INFORMATION

Reimbursement for moving costs and replacement housing payments are not considered income for the purpose of the Internal Revenue Code of 1954, or for the purpose of determining the extent of eligibility of a displacee for assistance under the Social Security Act, or any other law, ***except*** for any federal law providing local "Section 8" Housing Programs.

Any person, business, farm or nonprofit organization that has been refused a relocation payment by the Department relocation advisor or believes that the payment(s) offered by the agency are inadequate may appeal for a special

hearing of the complaint. No legal assistance is required. Information about the appeal procedure is available from the relocation advisor.

California law allows for the payment for lost goodwill that arises from the displacement for a public project. A list of ineligible expenses can be obtained from the Department's Division of Right of Way and Land Surveys. California's law and the federal regulations covering relocation assistance provide that no payment shall be duplicated by other payments being made by the displacing agency.

If your project includes relocations, include a link to the Division of Right of Way's Relocation Assistance Program at:

http://www.dot.ca.gov/hq/row/rap/index.htm

Appendix C Avoidance, Minimization and/or Mitigation Summary

To be sure that all environmental measures identified in this document are executed at the appropriate times, the following mitigation program (as articulated on the proposed Environmental Commitments Record [ECR] which follows) would be implemented. During project design, avoidance, minimization, and/or mitigation measures will be incorporated into the project's final plans, specifications, and cost estimates, as appropriate. All permits will be obtained prior to implementation of the project. During construction, environmental and construction/engineering staff will ensure that the commitments contained in the Environmental Commitments Record are fulfilled. Following construction and appropriate phases of project delivery, long-term mitigation maintenance and monitoring will take place, as applicable. As the following Environmental Commitments Record is a draft, some fields have not been completed and will be filled out as each of the measures is implemented.

Note: Some measures may apply to more than one resource area. Duplicated or redundant measures have not been included in this Environmental Commitments Record.

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
Visual/Aesthetics									
AES-1	Avoidance/ Minimization	The project will provide replacement highway planting, landscape improvements, and maintenance using recycled wastewater within the highway right-of-way at the Austin Road/State Route 99 interchange. These landscape improvements would be for a gateway feature at the Austin Road/State Route 99 interchange in accordance with the 2023 Manteca General Plan's Community Design Element. This would lessen aesthetic impacts of the project by providing a distinct, attractive gateway for the Austin Road/State Route 99 interchange, particularly in its position at the southeastern entrances to the City. Any highway planting will follow the Caltrans Highway Design Manual's Highway Planting Standards and Guidelines (Caltrans 2016).	Construction Contractor	After construction					
AES-2	Avoidance/ Minimization	The project will limit all construction lighting to within the area of work and avoid light trespass through directional lighting, shielding, and other measures as needed.	Construction Contractor	During construction					
Agricultural Resources (Farmlands)									
AG-1	Avoidance/ Minimization	Final design for the project will be coordinated with neighboring property owners and agricultural operators to incorporate design features to maintain access and operation of adjacent agricultural properties.	Project Applicant / Project Engineer	Prior to construction					
AG-2	Avoidance/ Minimization	Prior to the commencement of Project construction, the project contractor will reconstruct irrigation ditches and install irrigation pipelines on all agriculture parcels impacted during project construction to ensure proper drainage and irrigation.	Construction Contractor	After construction					
AG-3	Avoidance/ Minimization	The project will notify the California Department of Conservation prior to making a decision to acquire property under Williamson Act contracts for a public improvement (required per Government Code §§51290-51295, 51296.6).	Project Applicant	Prior to construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
Air Quality									
AQ-1	Avoidance/ Minimization	The following measures will be implemented by the project during construction activities: - The construction contractor must comply with Caltrans' Standard Specifications in Section 14-9 (2018). - Section 14-9-02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances. - Water or a dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions. - Soil binder will be spread on any unpaved roads used for construction purposes, and on all project construction parking areas. - Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions. - Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by Code of Regulations Title 17, Section 93114. - A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely re-vegetation of disturbed slopes as needed to minimize construction impacts to existing communities. - Equipment and materials storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly. - Environmentally sensitive areas will be established near sensitive air receptors. Within these areas, construction activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible. - Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used. - All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust during transportation. - Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce particulate matter emissions. - To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times. - Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown particulate matter in the area.	Construction Contractor	During construction					
AQ-2	Avoidance/ Minimization	Prepare and implement a dust control plan to comply with San Joaquin Valley Air Pollution Control District Regulation VIII requirements to control construction emissions of PM_{10}. To control the generation of construction-related PM_{10} emissions, the project construction contractors will prepare and submit for approval a dust control plan to the San Joaquin Valley Air Pollution Control District at least 30 days prior to any earthmoving or construction activities.	Construction Contractor	Prior to construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
AQ-3	Avoidance/ Minimization	The project will enter into a developer agreement with the San Joaquin Valley Air Pollution Control District and conduct an air impact assessment as required by San Joaquin Valley Air Pollution Control District Rule 9510. Off-site emission reduction fees will be calculated, as dictated by Rule 9510, to reduce construction-related NOx emissions by 20 percent and PM_{10} exhaust emissions by 45 percent to the statewide fleet average.	Project Applicant	Prior to and during construction					
Biological Resources									
BIO-1	Avoidance/ Minimization	The following measures will be implemented by the project to reduce the potential for take of the pallid bat: • Focused bat surveys will be conducted in the biological study area by a qualified bat biologist to determine if nursery or roost sites are present. Focused surveys will be the responsibility of the project. If pallid bats are roosting in the biological study area, the following measures will be implemented: ○ Prior to the nursery season for pallid bat (April through September), sites will be sealed or otherwise rendered unusable to bats (e.g., install grating). ○ Seal hibernation sites, prior to the hibernation season (November through March) when hibernation sites are identified in the biological study area. Alternatively, grating may be installed. ○ When colonial roosting sites in trees or structures must be removed, removal will occur outside of the nursery and/or hibernation seasons and will occur during dusk and/or evening hours after bats have left the roosting site.	Construction Contractor / Qualified Bat Biologist	Prior to and during construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
BIO-2	Avoidance/ Minimization	The following measures will be implemented by the project to reduce the potential for take of the Cooper's hawk and white-tailed kite: • If possible, all trees that will be impacted by the project construction will be removed during the non-nesting season (between September 1 and January 31) to avoid take of a nest or bird. If this is not possible, a survey for nesting Cooper's hawks and white-tailed kites will be conducted in the biological study area and within a 300-foot radius by a qualified biologist. The survey will be conducted to a maximum of 10 days prior to the start of construction. The survey area may be decreased due to property access constraints, etc. • If nesting Cooper's hawks or white-tailed kites are found within 300 feet of the biological study area, a qualified biologist will evaluate the potential for the project to disturb nesting activities. The evaluation criteria will include, but are not limited to, the location/orientation of the nest in the nest tree, the distance of the nest from the biological study area, and line of sight between the nest and the biological study area. • The California Department of Fish and Wildlife will be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities. • If work is allowed to proceed, a qualified biologist will be on-site weekly during construction activities that occur in breeding season to monitor nesting activity. The biologist will have the authority to stop work if it is determined the project is adversely affecting nesting activities. • If the qualified biologist determines that the setback can be reduced, initial construction activities in the vicinity of the nest will be monitored by a qualified biologist. If the biologist determines nesting is not affected by construction activities with the reduced setback, work can proceed. If it is determined that construction activities are adversely affecting the nesting birds with the reduced setback, all construction within 300 feet of a nest will be halted until the biologist can establish an appropriate setback. • Worker environmental awareness training will be conducted by a qualified biologist for all construction personnel. The training will instruct workers on the purpose of Environmentally Sensitive Area (ESA) fencing and the resources being protected.	Construction Contractor / Qualified Biologist	Prior to and during construction					

<table>
<tr><th rowspan="2">Initial Study Measure Number</th><th rowspan="2">Measure Type</th><th rowspan="2">Measure</th><th rowspan="2">Responsible Branch/Staff</th><th rowspan="2">Timing Phase</th><th colspan="2">Task Completed</th><th rowspan="2">Remarks</th><th colspan="2">Environmental Compliance</th></tr>
<tr><th>Initial</th><th>Date</th><th>Initial</th><th>Date</th></tr>
<tr><td>BIO-3</td><td>Avoidance/ Minimization</td><td>The following measures will be implemented by the project to reduce the potential for impacts to the burrowing owl:
• Preconstruction surveys for the burrowing owl will be conducted by a qualified biologist in accordance with California Department of Fish and Wildlife's 2012 Staff Report on Burrowing Owl Mitigation.
• If burrowing owls are identified during the preconstruction survey, passive exclusion will be implemented per California Department of Fish and Wildlife's 2012 Staff Report on Burrowing Owl Mitigation (including avoidance of occupied burrows during the breeding season from February 1 to August 31).
• Following construction, all fill slopes, temporary impacts and/or otherwise disturbed areas will be restored to preconstruction contours (if necessary) and revegetated with the native seed mix specified in Table 1: Native Species Mix. Invasive exotic plants will be controlled pursuant to the following:
- All earthmoving equipment to be used during project construction will be cleaned thoroughly before arrival on the project site.
- All seeding equipment (i.e., hydroseed trucks) will be thoroughly rinsed at
Table 1: Native Species Mix<table><tr><th>Scientific Name</th><th>Common Name</th><th>Rate (lbs/acre)</th><th>Minimum Percent Germination</th></tr><tr><td>Artemisia douglasiana</td><td>Mugwort</td><td>2.0</td><td>50</td></tr><tr><td>Bromus carinatuscarinatus</td><td>California brome</td><td>5.0</td><td>85</td></tr><tr><td>Elymus trachycaulus</td><td>Slender wheatgrass</td><td>2.0</td><td>60</td></tr><tr><td>Elymus X triticum</td><td>Regreen</td><td>10.0</td><td>80</td></tr><tr><td>Eschsolzia californica</td><td>California poppy</td><td>2.0</td><td>70</td></tr><tr><td>Hordeum brachyantherum</td><td>California barley</td><td>2.0</td><td>80</td></tr><tr><td>Lupinus bicolor</td><td>Bicolored lupine</td><td>4.0</td><td>80</td></tr></table>least three times prior to beginning seeding work.
- To avoid spreading any non-native invasive species already existing on site, to off-site areas, all equipment will be thoroughly cleaned before leaving the site.
- To avoid introduction of additional non-native species to the site, all fill dirt brought onto the site must be weed-free.</td><td>Construction Contractor / Qualified Biologist</td><td>Prior to, during, and after construction</td><td></td><td></td><td></td><td></td><td></td></tr>
</table>

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
BIO-4	Avoidance/ Minimization	The following measures will be implemented by the project to reduce the potential take of the Swainson's hawk: • If work begins between February 1 and August 31, an early season preconstruction survey for nesting Swainson's hawks will be conducted between January and March in the biological study area and immediate vicinity (an approximately 0.25-mile radius) by a qualified biologist when tree foliage is relatively sparse and nests are easy to identify. A second preconstruction survey for nesting Swainson's hawks will be conducted in the biological study area and immediate vicinity (an approximately 0.25-mile radius) by a qualified biologist no more than 10 days prior to initiation of earthmoving activities. • If nesting Swainson's hawks are found within the survey area, a qualified biologist will evaluate the potential for the project to disturb nesting activities. The California Department of Fish and Wildlife will be contacted to review the evaluation and determine if the project can proceed without adversely affecting nesting activities. The California Department of Fish and Wildlife will also be consulted to establish protection measures such as buffers. Disturbance of active nests will be avoided until it is determined by a qualified biologist that nesting is complete and the young have fledged, or that the nest has failed. If work is allowed to proceed, at a minimum, a qualified biologist will be on-site during the start of construction activities during the nesting season to monitor nesting activity. The monitor will have the authority to stop work if it is determined the project is adversely affecting nesting activities. • Worker environmental awareness training will be conducted by a qualified biologist for all construction personnel. This training instructs workers to recognize Swainson's hawks and their habitat(s). • Brightly colored Environmentally Sensitive Area (ESA) fencing will be placed along the limits of work to prevent unnecessary encroachment into adjacent areas. Fencing will be maintained in good condition for the duration of construction activities. • Following construction, all fill slopes, temporary impact and/or otherwise disturbed areas will be restored to preconstruction contours (if necessary) and revegetated with the native seed mix specified above in Table 3-12. Invasive exotic plants will be controlled pursuant to the measures presented in Section 5.7 of the Draft Natural Environment Study.	Construction Contractor / Qualified Biologist	Prior to, during, and after construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
BIO-5	Avoidance/ Minimization	The following measures will be implemented by the project to reduce the potential for take of the California horned lark and loggerhead shrike: • If construction begins during the nesting season (February 1 to August 31), a survey for nesting California horned larks and loggerhead shrikes will be conducted in the biological study area and within a 100-foot radius by a qualified biologist. The survey will be conducted a maximum of 10 days prior to the start of construction. • If nesting California horned larks or loggerhead shrikes are found within 100 feet of the project footprint during the survey, an initial setback of 100 feet from nesting areas will be established and protected with Environmentally Sensitive Area (ESA) fencing. ESA fencing will be maintained during the nesting season until construction is complete or the young have fledged, as determined by a qualified biologist. • A qualified biologist will evaluate the potential for the proposed work to disturb nesting activities considering the 100-foot setback. The evaluation criteria will include, but are not limited to, the location/orientation of the nest, the distance of the nest to the work limits, the line of sight between the nest and the work limits, and the description of the proposed work. • If work is allowed to proceed, a qualified biologist will be on-site weekly during construction activities that occur in breeding season to monitor nesting activity. The biologist will have the authority to stop work if it is determined the project is adversely affecting nesting activities. • If the qualified biologist determines that the setback can be reduced, initial construction activities in the vicinity of the nest will be monitored by a qualified biologist. If the biologist determines nesting is not affected by construction activities with the reduced setback, work can proceed. If it is determined that construction activities are adversely affecting the nesting birds with the reduced setback, all construction within 100 feet of a nest will be halted until the biologist can establish an appropriate setback. • Worker environmental awareness training will be conducted by a qualified biologist for all construction personnel. The training will instruct workers about the purpose of Environmentally Sensitive Area fencing and the resources being protected.	Construction Contractor / Qualified Biologist	Prior to and during construction					
BIO-6	Avoidance/ Minimization	To avoid the introduction of invasive species into the biological study area during project construction, contract specifications will include, at a minimum, the following measures: - All earthmoving equipment to be used during project construction will be cleaned thoroughly before arrival on the project site. - All seeding equipment (i.e., hydroseed trucks) will be thoroughly rinsed at least three times prior to beginning seeding work. - To avoid spreading non-native invasive species already existing on-site to off-site areas, all equipment will be thoroughly cleaned before leaving the site. - To avoid introduction of additional non-native species to the site, all fill dirt brought onto the site must be weed-free.	Construction Contractor / Qualified Biologist	Prior to and during construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
Cultural Resources									
CULT-1	Avoidance/Minimization	Prior to any ground disturbance, a qualified archaeologist will conduct a preconstruction meeting to orient the construction crew to the potential for encountering prehistoric archaeological deposits during construction. This instructional meeting will also include a discussion of the types of artifacts that could be encountered and the steps to take upon discovery to avoid inadvertent impacts to such finds.	Construction Contractor / Qualified Archaeologist	Prior to construction					
CULT-2	Standard	If cultural materials are discovered during construction, all earth-moving activity within 60 feet of the find will be diverted until a qualified archaeologist can assess the nature and significance of the find. If the cultural materials are Native American in origin, Native American groups would be contacted.	Construction Contractor / Qualified Archaeologist	During construction					
CULT-3	Standard	If human remains are encountered during project construction activities, the project will comply with the requirements of California Health and Safety Code Section 7050.50. There will be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of San Joaquin County has determined the manner and cause of any death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his/her authorized representative. At the same time, an archaeologist will be contacted to assess the situation and consult with agencies as appropriate. Project personnel/construction workers will not collect or move any human remains and associated materials. If the human remains are of Native American origin, the coroner must notify the Native American Heritage Commission within 24 hours of this identification. The Native American Heritage Commission will identify a Native American Most Likely Descendent to inspect the site and provide recommendations for the proper treatment of the remains and associated grave goods. At this time, the person who discovered the remains will contact Ben Elliot, Acting Senior Environmental Planner, Northern San Joaquin Valley Environmental Management Cultural Resources Branch, (209) 942-619157, so he may work with the Most Likely Descendent on the respectful treatment and disposition of the remains. Further provisions of Public Resources Code 5097.98 are to be followed as applicable.	Construction Contractor / County Coroner	During construction					
Geology									
GEO-1	Standard	A Geotechnical Report will be prepared by the Project which will outline required geologic/ geotechnical field investigations and laboratory testing that will be performed. The Geotechnical Report will be prepared to obtain site-specific data appropriate to design Phases 1A, 1B, and 1C of the proposed project.	Project Engineer / Construction Contractor	Prior to construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
Greenhouse Gas Emissions									
GHG-1	Avoidance/ Minimization	The project would ensure that applicable greenhouse gas-reducing diesel particulate and NO_X emissions measures for off-road construction vehicles are implemented during construction. The measures would be noted on all construction plans and the project sponsor would perform periodic site inspections. Applicable greenhouse gas-reducing measures include the following: • Use of diesel construction equipment meeting the Air Resources Board's Tier 2 certified engines or cleaner off-road heavy-duty diesel engines, and comply with the State Off-Road Regulation; • Use of on-road heavy-duty trucks meeting the Air Resources Board's 2007 or cleaner certification standard for on-road heavy-duty diesel engines, and comply with the State On-Road Regulation; • All on- and off-road diesel equipment would not idle for more than 5 minutes. Signs would be posted in the designated queuing areas and or job sites to remind drivers and operators of the 5-minute idling limit; • Use of electric equipment in place of diesel-powered equipment, where feasible; • Substitute gasoline-powered in place of diesel-powered equipment, where feasible; and • Use of alternatively fueled construction equipment on-site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.	Construction Contractor	During construction					
GHG-2	Avoidance/ Minimization	All lighting installed by the project will be energy-efficient and designed to use the least amount of energy to serve the purpose of the lighting. Lighting would use solar energy wherever feasible.	Project Engineer / Construction Contractor	During and after construction					
GHG-3	Avoidance/ Minimization	New landscaping design and irrigation systems installed by the project will be water-efficient.	Project Engineer / Construction Contractor	During and after construction					
Hazardous Waste and Materials									
HAZ-1	Avoidance/ Minimization	Structures or buildings constructed prior to 1989 may have been constructed using asbestos-containing materials. The project will conduct asbestos surveys using a certified consultant prior to any modification or demolition to accommodate the planned construction.	Project Applicant / Construction Contractor	Prior to construction					
HAZ-2	Avoidance/ Minimization	Structures or buildings constructed prior to 1978 are presumed to contain lead-based paints. The project will conduct lead-based paint surveys using a certified consultant prior to modifications/demolition of structures that may be altered or demolished to accommodate the planned construction.	Project Applicant / Construction Contractor	Prior to construction					
HAZ-3	Avoidance/ Minimization	Wood guardrail posts may have been treated with a chemical preservative to protect the wood from decay. Per Department of Toxic Substances Control Board regulations, Treated Wood Waste may be handled as a solid waste and testing and sampling of Treated Wood Waste is not required. The project will follow this guidance along with Caltrans specifications in the disposal of Treated Wood Waste.	Construction Contractor	Prior to construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
HAZ-4	Avoidance/ Minimization	To avoid impacts from pavement striping during construction, it is recommended that testing and removal requirements for yellow striping and pavement marking materials be performed by the project in accordance with Caltrans Standard Special Provision 14-11.12 - Remove Yellow Traffic Stripe and Pavement Marking with Hazardous Waste Residue.	Construction Contractor	During construction					
Noise									
NOI-1	Avoidance/ Minimization	The project will implement appropriate additional noise mitigation measures, including changing the location of stationary construction equipment, turning off idling equipment, rescheduling construction activity, notifying adjacent residents in advance of construction work, and/or installing acoustic barriers around station construction noise sources if deemed excessive stationary noise levels by local noise ordinance standards.	Construction Contractor	During construction					
NOI-2	Avoidance/ Minimization CEQA Mitigation Measure	Construction of noise barrier NB-2 (12 feet tall) in Areas C, D, and E will occur at the start of Phase 1A construction (construction year 2023). This barrier will be constructed at the start of Phase 1A construction so it will be functional during Phases 1B and 1C of the project to attenuate operational noise at sensitive receptors once the project is fully operational (design year 2043).	Project Engineer / Construction Contractor	During construction					
Traffic and Transportation									
TRA-1	Standard	The project will be required to prepare and implement a Traffic Management Plan to address short-term disruptions in existing circulation patterns during construction. The Traffic Management Plan will identify the locations of temporary detours and signage to facilitate local traffic patterns and through-traffic requirements. The Traffic Management Plan will also provide access plans for affected businesses and residential units that will be impacted by short-term and long-term road closures to ensure access to uses are still available during construction activities.	Project Applicant / Construction Contractor	During construction					
TRA-2	Avoidance/ Minimization	The project's special provisions of the highway contract will require that emergency service providers (i.e., law enforcement, fire protection, and ambulance services) be given adequate advance notice of any road closures during the construction phases of the project.	Construction Contractor	During construction					
TRA-3	Avoidance/ Minimization	Construction activities will be coordinated by the project to avoid blocking or limiting access to residential units and businesses to the extent possible as applicable. Residents and business owners will be notified by the project in advance about potential access or parking effects prior to the start of construction activities.	Construction Contractor	During construction					
TRA-4	Avoidance/ Minimization	To improve morning and evening peak hour operations at the eastbound State Route 120 off-ramp/Main Street intersection, the ramp will be widened by the project to provide the following: • 400-foot eastbound State Route 120 off-ramp right-turn lane • 300-foot northbound Main Street right-turn With these improvements, the eastbound State Route 120 off-ramp/Main Street intersection would improve from level of service E to level of service D conditions during the morning peak hour and would improve from level of service F to level of service D conditions during the evening peak hour.	City of Manteca	During construction					
TRA-5	Avoidance/ Minimization	To improve morning peak hour operations at the Moffat Boulevard/Woodward Avenue intersection, the intersection will be improved by the project with the installation of a signal. With this improvement, the Moffat Boulevard/Woodward Avenue intersection would improve from level of service F to level of service C conditions during the morning peak hour.	Project Applicant / Project Engineer	During construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
TRA-6	Avoidance/ Minimization	To improve evening peak hour operations at the northbound State Route 99 ramps/Yosemite Avenue intersection, the intersection signal timings will be optimized and coordinated by the project to provide additional green time for the eastbound Yosemite Avenue right-turn volume onto northbound State Route 99. With this improvement, the northbound State Route 99 ramps/Yosemite Avenue intersection would improve from level of service E to level of service D conditions during the evening peak hour under the construction year 2023.	City of Manteca	During construction					
TRA-7	Avoidance/ Minimization	To improve evening peak hour operations, the Moffat Boulevard Connector/Austin Road, Moffat Boulevard/Woodward Avenue connector, and Woodward Avenue/Main Street will be improved by the project with the installation of a signal. With this improvement, the Moffat Boulevard connector/Austin Road intersection would improve from level of service E to level of service C conditions during the evening peak hour; the Moffat Boulevard/Woodward Avenue connector intersection would improve from level of service F to level of service D conditions during the evening peak hour; and, the Woodward Avenue/Main Street intersection would improve from level of service F to level of service D conditions during the evening peak hour.	City of Manteca	During construction					
TRA-8	Avoidance/ Minimization	To improve the morning/evening peak hour operations at the eastbound State Route 120 off-ramp/Main Street intersection, the interchange will need to be reconstructed by the project proponent based on San Joaquin Council of Governments Regional Transportation Plan/Sustainable Communities Strategy Interchange Project List. This improvement would need to be constructed by the project proponent prior to design year 2043 conditions. With this improvement, the eastbound State Route 120 off-ramp/Main Street intersection would improve from level of service F to level of service D conditions during the morning/evening peak hours.	City of Manteca	During construction / Prior to Design Year 2043					
TRA-9	Avoidance/ Minimization	To improve the morning/evening peak hour operations at the State Route 120/Main Street intersections, the interchange would need to be reconstructed by the project proponent based on San Joaquin Council of Governments Regional Transportation Plan/Sustainable Communities Strategy Interchange Project List. This improvement would be constructed by the project proponent before design year 2043 conditions. With the improvements, the State Route 120/Main Street intersections would improve from unacceptable level of service F to acceptable level of service D conditions during the morning/evening peak hours.	City of Manteca	During construction / Prior to Design Year 2043					
Utilities and Emergency Services									
UT-1	Avoidance/ Minimization	The project will be designed to minimize conflicts with utilities in the project area. The project will include relocation of those utilities that would be inaccessible for maintenance or access purposes as a result of the project implementation.	Project Engineer / Construction Contractor	Prior to and during construction					
UT-2	Avoidance/ Minimization	The project will be required to notify utility users of any short-term, limited interruptions of service.	Construction Contractor	During construction					
UT-3	Avoidance/ Minimization	If unexpected underground utilities are encountered, the project will coordinate with the utility provider to develop plans to address the utility conflict, protect the utility if needed, and limit service interruptions.	Construction Contractor	During construction					

Initial Study Measure Number	Measure Type	Measure	Responsible Branch/Staff	Timing Phase	Task Completed		Remarks	Environmental Compliance	
					Initial	Date		Initial	Date
UT-4	Avoidance/ Minimization	The project will circulate construction schedules and traffic control information to local emergency service providers at least two weeks before any road closures.	Construction Contractor	Prior to and during construction					
Water Quality									
WQ-1	Standard	Preparation and implementation of construction site temporary best management practices by the project will comply with the provisions of the Caltrans Statewide National Pollutant Discharge Elimination System Permit and any subsequent permit as they relate to construction activities for the project. These best management practices will include submission of a Notice of Intention to the Central Valley Regional Water Quality Control Board at least 30 days before the start of construction and submission of a Notice of Termination to the Regional Water Quality Control Board upon completion of construction and stabilization of the project site. The temporary best management practices will be installed by the project prior to any construction operations and will be in place for the duration of the contract. The removal of these best management practices by the project will be the final operation, along with the project site cleanup.	Construction Contractor	Prior to and during construction					
WQ-2	Standard	The project will follow Design Pollution Prevention and Treatment Control best management practices for the project in accordance with the procedures outlined in the Stormwater Quality Handbooks, Project Planning and Design Guide. Compliance with Design Pollution Prevention and Treatment Control best management practices will include coordination with the Regional Water Quality Control Board with respect to feasibility, maintenance, and monitoring of Treatment Control best management practices as set forth in Caltrans' Statewide Stormwater Management Plan. A Water Pollution Control Program will need to be prepared by a Qualified Stormwater Pollution Prevention Plan Practitioner.	Construction Contractor	Prior to and during construction					
WQ-3	Standard	The project will be required to comply to the provisions specified in Section 13, "Water Pollution Control," and Section 14-11, "Hazardous Waste and Contamination," of the California State Standard Specifications, regarding spill prevention and control measures. All workers will be informed by the project of the importance of preventing spills and of the appropriate measures to take should a spill occur.	Construction Contractor	During construction					
WQ-4	Standard	To control sedimentation during and after project implementation, the project will implement best management practices outlined in any authorizations or permits, issued under the authorities of the Clean Water Act that it receives for the project. If best management practices are ineffective, the project will remedy the situation immediately, in consultation with the regulatory and resource agencies.	Construction Contractor	During construction					

Appendix D Species Lists

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Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Avena (3712171) OR Lathrop (3712173) OR Manteca (3712172) OR Peters (3712181) OR Ripon (3712162) OR Salida (3712161) OR Stockton East (3712182) OR Stockton West (3712183) OR Vernalis (3712163))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Agelaius tricolor tricolored blackbird	ABPBXB0020	None	Threatened	G2G3	S1S2	SSC
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Anniella pulchra northern California legless lizard	ARACC01020	None	None	G3	S3	SSC
Anthicus sacramento Sacramento anthicid beetle	IICOL49010	None	None	G1	S1	
Antrozous pallidus pallid bat	AMACC10010	None	None	G5	S3	SSC
Astragalus tener var. tener alkali milk-vetch	PDFAB0F8R1	None	None	G2T1	S1	1B.2
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Blepharizonia plumosa big tarplant	PDAST1C011	None	None	G1G2	S1S2	1B.1
Bombus caliginosus obscure bumble bee	IIHYM24380	None	None	G4?	S1S2	
Bombus crotchii Crotch bumble bee	IIHYM24480	None	None	G3G4	S1S2	
Bombus occidentalis western bumble bee	IIHYM24250	None	None	G2G3	S1	
Branchinecta conservatio Conservancy fairy shrimp	ICBRA03010	Endangered	None	G2	S2	
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Branta hutchinsii leucopareia cackling (=Aleutian Canada) goose	ABNJB05035	Delisted	None	G5T3	S3	WL
Brasenia schreberi watershield	PDCAB01010	None	None	G5	S3	2B.3
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Chloropyron palmatum palmate-bracted bird's-beak	PDSCR0J0J0	Endangered	Endangered	G1	S1	1B.1
Cirsium crassicaule slough thistle	PDAST2E0U0	None	None	G1	S1	1B.1
Coccyzus americanus occidentalis western yellow-billed cuckoo	ABNRB02022	Threatened	Endangered	G5T2T3	S1	
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Desmocerus californicus dimorphus valley elderberry longhorn beetle	IICOL48011	Threatened	None	G3T2	S2	
Elanus leucurus white-tailed kite	ABNKC06010	None	None	G5	S3S4	FP
Elderberry Savanna Elderberry Savanna	CTT63440CA	None	None	G2	S2.1	
Eremophila alpestris actia California horned lark	ABPAT02011	None	None	G5T4Q	S4	WL
Eryngium racemosum Delta button-celery	PDAPI0Z0S0	None	Endangered	G1	S1	1B.1
Extriplex joaquinana San Joaquin spearscale	PDCHE041F3	None	None	G2	S2	1B.2
Falco columbarius merlin	ABNKD06030	None	None	G5	S3S4	WL
Great Valley Cottonwood Riparian Forest Great Valley Cottonwood Riparian Forest	CTT61410CA	None	None	G2	S2.1	
Great Valley Mixed Riparian Forest Great Valley Mixed Riparian Forest	CTT61420CA	None	None	G2	S2.2	
Great Valley Valley Oak Riparian Forest Great Valley Valley Oak Riparian Forest	CTT61430CA	None	None	G1	S1.1	
Hibiscus lasiocarpos var. occidentalis woolly rose-mallow	PDMAL0H0R3	None	None	G5T3	S3	1B.2
Hypomesus transpacificus Delta smelt	AFCHB01040	Threatened	Endangered	G1	S1	
Lanius ludovicianus loggerhead shrike	ABPBR01030	None	None	G4	S4	SSC
Lathyrus jepsonii var. jepsonii Delta tule pea	PDFAB250D2	None	None	G5T2	S2	1B.2
Lepidurus packardi vernal pool tadpole shrimp	ICBRA10010	Endangered	None	G4	S3S4	
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta moesta moestan blister beetle	IICOL4C020	None	None	G2	S2	

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Melospiza melodia song sparrow ("Modesto" population)	ABPBXA3010	None	None	G5	S3?	SSC
Mylopharodon conocephalus hardhead	AFCJB25010	None	None	G3	S3	SSC
Neotoma fuscipes riparia riparian (=San Joaquin Valley) woodrat	AMAFF08081	Endangered	None	G5T1Q	S1	SSC
Oncorhynchus mykiss irideus pop. 11 steelhead - Central Valley DPS	AFCHA0209K	Threatened	None	G5T2Q	S2	
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Sagittaria sanfordii Sanford's arrowhead	PMALI040Q0	None	None	G3	S3	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Spirinchus thaleichthys longfin smelt	AFCHB03010	Candidate	Threatened	G5	S1	
Sylvilagus bachmani riparius riparian brush rabbit	AMAEB01021	Endangered	Endangered	G5T1	S1	
Symphyotrichum lentum Suisun Marsh aster	PDASTE8470	None	None	G2	S2	1B.2
Thamnophis gigas giant gartersnake	ARADB36150	Threatened	Threatened	G2	S2	
Trichocoronis wrightii var. wrightii Wright's trichocoronis	PDAST9F031	None	None	G4T3	S1	2B.1
Trifolium hydrophilum saline clover	PDFAB400R5	None	None	G2	S2	1B.2
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Vireo bellii pusillus least Bell's vireo	ABPBW01114	Endangered	Endangered	G5T2	S2	
Xanthocephalus xanthocephalus yellow-headed blackbird	ABPBXB3010	None	None	G5	S3	SSC

Record Count: 56

Commercial Version -- Dated August, 3 2019 -- Biogeographic Data Branch

Report Printed on Thursday, August 08, 2019

Page 3 of 3

Information Expires 2/3/2020

CNPS California Native Plant Society

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

19 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712163, 3712162, 3712161, 3712173, 3712172, 3712171, 3712163 3712162 and 3712161;

Modify Search Criteria | Export to Excel | Modify Columns | Modify Sort | Display Photos

Scientific Name	Common Name	Family	Lifeform	Blooming Period	CA Rare Plant Rank	State Rank	Global Rank
Astragalus tener var. tener	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	1B.2	S1	G2T1
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G3T2
Atriplex coronata var. coronata	crownscale	Chenopodiaceae	annual herb	Mar-Oct	4.2	S3	G4T3
Atriplex minuscula	lesser saltscale	Chenopodiaceae	annual herb	May-Oct	1B.1	S2	G2
Blepharizonia plumosa	big tarplant	Asteraceae	annual herb	Jul-Oct	1B.1	S1S2	G1G2
Brasenia schreberi	watershield	Cabombaceae	perennial rhizomatous herb (aquatic)	Jun-Sep	2B.3	S3	G5
Centromadia parryi ssp. rudis	Parry's rough tarplant	Asteraceae	annual herb	May-Oct	4.2	S3	G3T3
Chloropyron palmatum	palmate-bracted bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	May-Oct	1B.1	S1	G1
Cirsium crassicaule	slough thistle	Asteraceae	annual / perennial herb	May-Aug	1B.1	S1	G1
Delphinium recurvatum	recurved larkspur	Ranunculaceae	perennial herb	Mar-Jun	1B.2	S2?	G2?
Eryngium racemosum	Delta button-celery	Apiaceae	annual / perennial herb	Jun-Oct	1B.1	S1	G1
Extriplex joaquinana	San Joaquin spearscale	Chenopodiaceae	annual herb	Apr-Oct	1B.2	S2	G2
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	Malvaceae	perennial rhizomatous herb (emergent)	Jun-Sep	1B.2	S3	G5T3
Lathyrus jepsonii var. jepsonii	Delta tule pea	Fabaceae	perennial herb	May-Jul(Aug-Sep)	1B.2	S2	G5T2
Puccinellia simplex	California alkali grass	Poaceae	annual herb	Mar-May	1B.2	S2	G3
Sagittaria sanfordii	Sanford's arrowhead	Alismataceae	perennial rhizomatous herb (emergent)	May-Oct(Nov)	1B.2	S3	G3
Symphyotrichum lentum	Suisun Marsh aster	Asteraceae	perennial rhizomatous herb	(Apr)May-Nov	1B.2	S2	G2

Trichocoronis wrightii var. wrightii	Wright's trichocoronis	Asteraceae	annual herb	May-Sep	2B.1	S1	G4T3
Trifolium hydrophilum	saline clover	Fabaceae	annual herb	Apr-Jun	1B.2	S2	G2

Suggested Citation

California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 08 August 2019].

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
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2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To:
Consultation Code: 08ESMF00-2017-SLI-3170
Event Code: 08ESMF00-2019-E-08655
Project Name: SR 99/120 Interchange Project

August 08, 2019

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

08/08/2019 Event Code: 08ESMF00-2019-E-08655

Attachment(s):

- Official Species List

08/08/2019 Event Code: 08ESMF00-2019-E-08655

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2017-SLI-3170

Event Code: 08ESMF00-2019-E-08655

Project Name: SR 99/120 Interchange Project

Project Type: TRANSPORTATION

Project Description: MKT1507

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/37.77507576825451N121.18082668960157W



Counties: San Joaquin, CA

Endangered Species Act Species

There is a total of 7 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Reptiles

NAME	STATUS
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/321

Insects

NAME	STATUS
Valley Elderberry Longhorn Beetle *Desmocerus californicus dimorphus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/7850
Habitat assessment guidelines:
https://ecos.fws.gov/ipac/guideline/assessment/population/436/office/11420.pdf

Crustaceans

NAME	STATUS
Vernal Pool Fairy Shrimp *Branchinecta lynchi*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/498

Vernal Pool Tadpole Shrimp *Lepidurus packardi*	Endangered

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2246

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION

Quad Name **Manteca**
Quad Number **37121-G2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat -
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Stockton West**
Quad Number **37121-H3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -

CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - X

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -

Chinook Salmon EFH - **X**
Groundfish EFH - **X**
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Stockton East**
Quad Number **37121-H2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Lathrop**
Quad Number **37121-G3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -

CCV Steelhead DPS (T) - X
Eulachon (T) -
sDPS Green Sturgeon (T) - X

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - X

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name Avena
Quad Number 37121-G1

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -

CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Vernalis**
Quad Number **37121-F3**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - **X**
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - **X**

ESA Marine Invertebrates

Range Black Abalone (E) -

Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office
562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Ripon**
Quad Number **37121-F2**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) - **X**

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -
CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -

CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat - X

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -

Chinook Salmon EFH - **X**
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Quad Name **Salida**
Quad Number **37121-F1**

ESA Anadromous Fish

SONCC Coho ESU (T) -
CCC Coho ESU (E) -
CC Chinook Salmon ESU (T) -
CVSR Chinook Salmon ESU (T) -
SRWR Chinook Salmon ESU (E) -
NC Steelhead DPS (T) -
CCC Steelhead DPS (T) -
SCCC Steelhead DPS (T) -
SC Steelhead DPS (E) -
CCV Steelhead DPS (T) - **X**
Eulachon (T) -
sDPS Green Sturgeon (T) -

ESA Anadromous Fish Critical Habitat

SONCC Coho Critical Habitat -
CCC Coho Critical Habitat -

CC Chinook Salmon Critical Habitat -
CVSR Chinook Salmon Critical Habitat -
SRWR Chinook Salmon Critical Habitat -
NC Steelhead Critical Habitat -
CCC Steelhead Critical Habitat -
SCCC Steelhead Critical Habitat -
SC Steelhead Critical Habitat -
CCV Steelhead Critical Habitat - X
Eulachon Critical Habitat -
sDPS Green Sturgeon Critical Habitat -

ESA Marine Invertebrates

Range Black Abalone (E) -
Range White Abalone (E) -

ESA Marine Invertebrates Critical Habitat

Black Abalone Critical Habitat -

ESA Sea Turtles

East Pacific Green Sea Turtle (T) -
Olive Ridley Sea Turtle (T/E) -
Leatherback Sea Turtle (E) -
North Pacific Loggerhead Sea Turtle (E) -

ESA Whales

Blue Whale (E) -
Fin Whale (E) -
Humpback Whale (E) -
Southern Resident Killer Whale (E) -
North Pacific Right Whale (E) -
Sei Whale (E) -
Sperm Whale (E) -

ESA Pinnipeds

Guadalupe Fur Seal (T) -
Steller Sea Lion Critical Habitat -

Essential Fish Habitat

Coho EFH -
Chinook Salmon EFH - X
Groundfish EFH -
Coastal Pelagics EFH -
Highly Migratory Species EFH -

MMPA Species (See list at left)

ESA and MMPA Cetaceans/Pinnipeds
See list at left and consult the NMFS Long Beach office 562-980-4000

MMPA Cetaceans -
MMPA Pinnipeds -

Appendix E List of Technical Studies Bound Separately

1) *Air Quality Report State Route 99/State Route 120 Interchange Connector Project,* prepared by Terry A. Hayes Associates, Inc. March 2019.
2) *Natural Environment Study State Route 99/State Route 120 Interchange Connector*, prepared by LSA, November 2018.
3) *Final Community Impact Assessment Checklist State Route 99/State Route 120 Interchange Connector Project*, prepared by LSA, February 2019.
4) *Historic Property Survey Report*, prepared by LSA, November 2018.
5) *Archaeological Survey Report State Route 99 at State Route 120 Interchange Improvements Project*, prepared by LSA, July 2018.
6) *Historical Resources Evaluation Report State Route 99 at State Route 120 Interchange Improvements Project*, prepared by LSA, November 2018.
7) *Preliminary Foundation Report Austin Road Overhead*, prepared by Parikh Consultants, Inc., December 8, 2017.
8) *Preliminary Geotechnical Report State Route 99/State Route 120 Interchange Connector Project*, prepared by prepared by Parikh Consultants, Inc., December 13, 2017.
9) *Soil Investigation Report SR 99/SR-120 Interchange Connector Project Phase I Austin Road*, prepared by Geocon Consultants, Inc., July 2018.
10) *Aerially Deposited Lead Assessment State Route 99/State Route 120 Interchange*, prepared by Blackburn Consulting, February 2018.
11) *Initial Environmental Site Assessment State Route 99/State Route 120 Interchange Reconstruction Project*, prepared by Parikh Consultants, Inc. January 23, 2019.
12) *Noise Study Report State Route 99/State Route 120 Interchange Project*, prepared by Terry A. Hayes Associates, Inc. (TAHA), October 2018.
13) *Noise Abatement Decision Report State Route 99/State Route 120 Interchange Project*, prepared by Terry A. Hayes Associates, Inc. (TAHA), October 2018.
14) *Paleontological Identification Report/Paleontological Evaluation Report State Route 99/State Route 120 Interchange Connector Project*, prepared by LSA, February 2018.

15) *Relocation Impact Statement and Last Resort Housing Plan for the State Route 99/State Route 120 Project*, prepared by Bender Rosenthal Incorporated, September 2018.

16) *Final Traffic Operations Analysis Report (DFTOAR) for the State Route 120/State Route 99 Improvement Project*, prepared by Fehr and Peers, January 2019.

17) *Visual Impact Assessment State Route 99/State Route 120 Interchange Project* prepared by LSA, April 2018.

18) *Water Quality Assessment Report State Route 99/State Route 120 Interchange Connector Project*, prepared by LSA, January 2018.