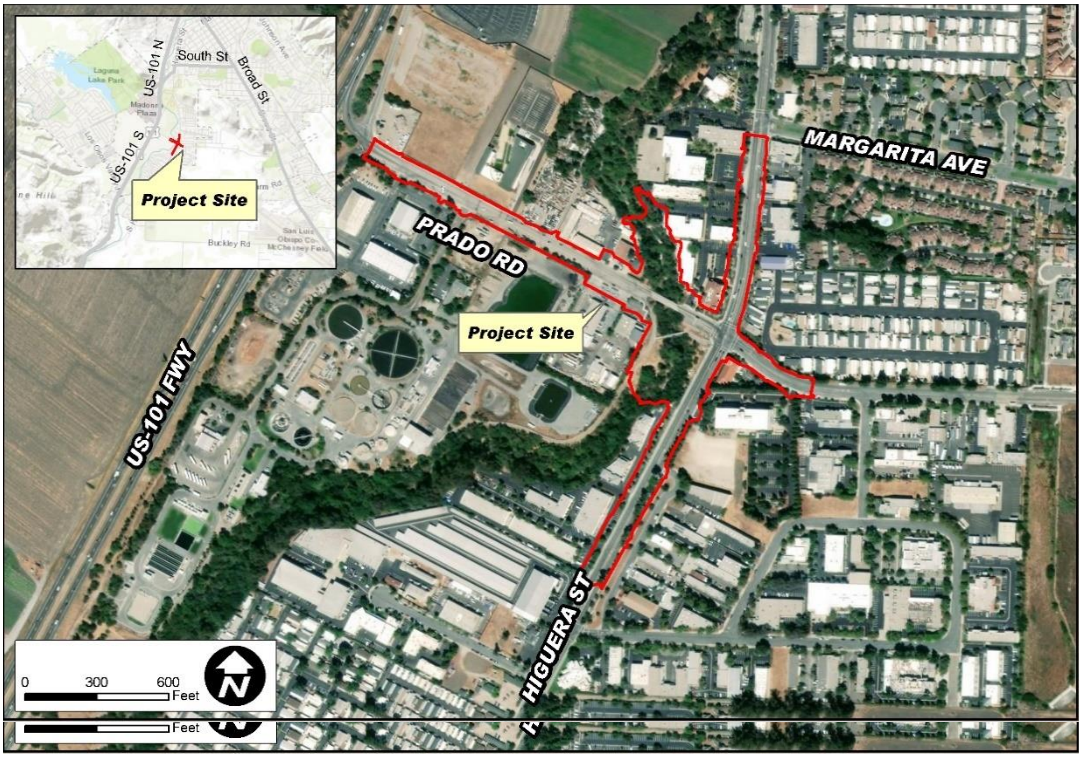
AIR QUALITY REPORT

Prado Road Bridge Replacement Project



San Luis Obispo County, CA

District 5-0-SLO
BRLS-5016(056)

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Caltrans

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AIR QUALITY REPORT

SAN LUIS OBISPO COUNTY, CALIFORNIA

CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 5

BRLS-5016(056)

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Acronyms and Abbreviations

Term	Definition
AADT	Average annual daily traffic
AB	Assembly bill
ADT	Average daily traffic
AQMP	Air Quality Management Plan
ARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
Cal/EPA	California Environmental Protection Agency
Caltrans	California Department of Transportation
CAP	Climate Action Program
CCAA	California Clean Air Act
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
County	San Luis Obispo County
EO	Executive Order
FCAA	Federal Clean Air Act
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHG	Greenhouse gas
IPCC	International Panel on Climate Change
LOS	Level of service
MOVES	Motor Vehicle Emission Simulator

Term	Definition
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NATA	National Air Toxics Assessment
NEPA	National Environmental Policy Act
NHTSA	National Highway Traffic Safety Administration
NO_2	Nitrogen dioxide
NOA	Naturally occurring asbestos
NO_x	Nitrogen oxide
O_3	Ozone
OMB	White House Office of Management & Budget
OPR	Office of Planning and Research
PM	Particulate matter
PM_{10}	Particulate matter less than 10 microns in diameter
$PM_{2.5}$	Particulate matter less than 2.5 microns in diameter
ppm	Parts per million
Protocol	Transportation Project-Level Carbon Monoxide Protocol
ROGs	Reactive organic gases
RTP	Regional Transportation Plan
RTPA	Regional Transportation Planning Agency
SB	Senate Bill
SIP	State Implementation Plan
SLOCOG	San Luis Obispo County of Governments
SLO County APCD	San Luis Obispo County Air Pollution Control District
SO_2	Sulfur dioxide
TACs	Toxic air contaminants
TIP	Transportation Improvement Program
USC	United States Code

Term	**Definition**
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
U.S. Highway 101	US 101
UV	Ultraviolet
VMT	Vehicle miles traveled
VOCs	Volatile organic compounds

1. Proposed Project Description

1.1 Introduction

The City of San Luis Obispo, in coordination with the California Department of Transportation (Caltrans), proposes to replace the existing structurally deficient and functionally obsolete Prado Road Bridge crossing over San Luis Obispo Creek with a new wider structure to meet current and projected future travel demands through the addition of additional vehicular lanes and dedicated bicycle and pedestrian facilities. In conjunction with the bridge replacement, the City of San Luis Obispo plans to construct improvements to the Prado Road/Higuera intersection and to the adjacent Bob Jones Trail. The Prado Road Bridge over San Luis Obispo Creek is located approximately 1,400 feet east of U.S. Highway 101 (US 101) on the western segment of the signalized intersection of Prado Road and South Higuera Street.

Caltrans is the National Environmental Policy Act (NEPA) Lead Agency and the City of San Luis Obispo is the California Environmental Quality Act (CEQA) Lead Agency. The purpose of this Air Quality Report is to inform the NEPA document with background information and project-specific analysis related to the project. The CEQA analysis is included in a separate technical memorandum prepared for the City of San Luis Obispo.

The following analysis includes assessments related to carbon monoxide (CO), nitrogen dioxide (NO_2), nitrogen oxides (NO_X), volatile organic compound (VOC), reactive organic gas (ROG), ozone (O_3), sulfur dioxide (SO_2), sulfur oxide (SO_X), lead (Pb), particles of 10 micrometers or smaller (PM_{10}), particles of 2.5 micrometers or smaller ($PM_{2.5}$), diesel particulate matter (DPM), toxic air contaminants (TAC), and greenhouse gas (GHG) emissions.

1.2 Location and Background

Prado Road is a critical component of the City of San Luis Obispo's Circulation Element, shown as a future arterial route west of US 101 and a highway/regional route east of US 101. The Prado Road Bridge over San Luis Obispo Creek was built in 1957 and is located approximately 1,400 feet east of US 101 on the western segment of the signalized intersection of Prado Road and South Higuera Street. Commercial and industrial facilities are located near the southwest, southeast, and northwest areas of the Prado Road/Higuera Street intersection. Residences are located northeast of the intersection. Figure 1.1 shows the project location.

This proposed project is included in Amendment No. 4 of the 2019 Federal Transportation Improvement Program (Project ID 4213) and is proposed for funding from the federal Highway Bridge Program and local Transportation Impact Fees. It is also included in the San Luis Obispo Council of Governments (SLOCOG) Year 2019 Regional Transportation Plan (Project ID CEN-RORS-1002).

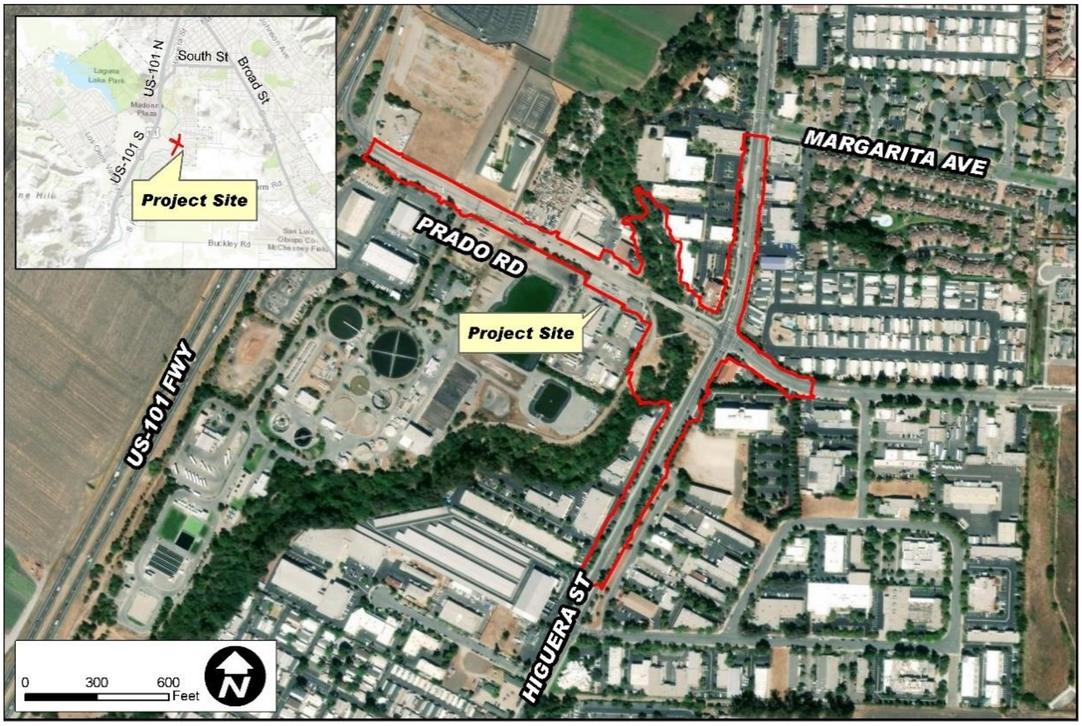

Figure 1.1. Map of the Project Location.

1.3 Purpose and Need

The existing Prado Road Bridge over San Luis Obispo Creek is classified as structurally deficient. The bridge is also functionally obsolete, as the existing two-lane bridge lacks any pedestrian or bicycle facilities and has insufficient width to accommodate existing and future multimodal traffic demands. The City and Caltrans concur that bridge replacement is an appropriate action to address these deficiencies. The primary purpose of the proposed project is to replace the structurally deficient bridge, with secondary consideration for addressing the functional obsolescence of this facility. Additional goals of the project are to provide bicycle and pedestrian facilities across the bridge, improve multimodal operations at the Prado Road/Higuera Street intersection, and improve connectivity to the adjacent Bob Jones Bike Trail. The need of the project is to provide a structurally adequate bridge, that safely accommodates expected multi-modal traffic.

1.4 Baseline and Forecasted Conditions for No-Build and Project Alternatives

The proposed alternatives include the No-Build (No Action) Alternative and one Build Alternative. These alternatives are each discussed below.

1.4.1 Existing Roadways and Traffic Conditions

The Baseline year has been established as 2018 for the environmental analysis. The roads primarily affected by the proposed project are Prado Road and Higuera Street. Prado Road is a critical component of the City of San Luis Obispo's Circulation Element. The Prado Road Bridge over San Luis Obispo Creek was built in 1957 and is currently a constriction point in the roadway because Prado Road is wider to the west and east of the bridge. Prado Road is an east-west arterial roadway and truck route within the City of San Luis Obispo with connection to northbound US 101 on its existing westerly terminus. From US 101, Prado Road extends approximately 3,800 feet to the east, including a signalized intersection with Higuera Street, a north-south arterial. Higuera Street is located approximately 1,700 feet to the east of US 101.

Prado Road is one lane in each direction, although it widens to include turn lanes at the intersection. The speed limit is 35 miles per hour. Higuera Street is two lanes in each direction with a median and bike lane. The speed limit is 40 miles per hour. Figure 1.1 shows the project limits, major roadways, and existing land uses. The proposed improvements would reduce intersection delays during the peak periods resulting in improved traffic flow. Therefore, the traffic study includes peak hour traffic volumes for the delay analysis instead of average daily traffic volumes and associated vehicle miles traveled (VMT). Peak hour volumes and delay are shown in Table 1.1. Level of Service (LOS) information is provided in Appendix B.

Table 1.1. Summary of Existing/Baseline (2018) Traffic Conditions.

Segment	Average AM Delay (Seconds)	AM Peak Hour Volume		Average PM Delay (Seconds)	PM Peak Hour Volume	
		Total	Truck		Total	Truck
Eastbound Intersection Approach	17.4	258	5	25.7	123	2
Westbound Intersection Approach	17.9	184	4	25.3	292	6
Southbound Intersection Approach	17.2	718	14	28.2	739	15
Northbound Intersection Approach	15.7	593	12	24.2	1,062	21

Source: Central Coast Transportation Consulting, 2021.

1.4.2 No-Build Alternative

The No-Build (No Action) Alternative consists of those transportation and development projects that are already planned for construction by or before 2035. Consequently, the No-Build Alternative represents future travel conditions in the study area without the Prado Bridge Replacement Project and is the baseline against the Build Alternative which will be assessed to meet NEPA requirements. The No-Build Alternative reflects conditions with an overcrossing of US 101 and northbound ramps (half interchange) with buildout of the City per current General Plan projections. Peak hour volumes and delay are shown in Table 1.2. LOS information is provided in Appendix B.

Table 1.2. Summary of Future No-Build Alternative (2035) Traffic Conditions.

Segment	Average AM Delay (Seconds)	AM Peak Hour Volume		Average PM Delay (Seconds)	PM Peak Hour Volume	
		Total	Truck		Total	Truck
Eastbound Intersection Approach	32.3	951	19	35.7	782	16
Westbound Intersection Approach	33.4	788	16	35.2	1,448	29
Southbound Intersection Approach	100.3	1064	21	158.6	1,000	20
Northbound Intersection Approach	72.3	665	13	159.0	1,108	22

Source: Central Coast Transportation Consulting, 2021.

1.4.3 Project Build Alternative

The City proposes to increase the total bridge width from 26.5 feet to 114 feet through installation of a replacement structure that would widen the existing bridge location on both the north and south ends. The project also includes widening to the north and south along Prado Road between the bridge at the Prado Road/Higuera Street intersection to conform with the replacement bridge section and widening along the west side of South Higuera Street at the Prado Road/Higuera Street intersection to accommodate a second northbound-to-westbound left-turn lane and improve bicycle/pedestrian facilities. The project site is located directly adjacent to the Bob Jones Trail, also known as the Bob Jones City to Sea Trail, a paved Class 1 dedicated bicycle and pedestrian path. The proposed project includes the construction of protected intersection improvements at the Prado Road/South Higuera Street intersection with separate, channelized bike and pedestrian paths and high-visibility crosswalks. The west leg of the intersection will include a two-way bike crosswalk to facilitate connections between the existing terminus of the Bob Jones Trail and a potential future extension north of Prado Road.

Peak hour volumes and delay are shown in Table 1.3. LOS information is provided in Appendix B.

Table 1.3. Summary of Future Build Alternative (2035) Traffic Conditions.

Segment	Average AM Delay (Seconds)	AM Peak Hour Volume		Average PM Delay (Seconds)	PM Peak Hour Volume	
		Total	Truck		Total	Truck
Eastbound Intersection Approach	27.6	951	19	37.2	782	16
Westbound Intersection Approach	26.9	788	16	61.4	1,448	29
Southbound Intersection Approach	26.9	1,064	21	55.3	1,000	20
Northbound Intersection Approach	32.2	665	13	60.8	1,108	22

Source: Central Coast Transportation Consulting, 2021.

1.4.4 Comparison of Existing/Baseline and Build Alternatives

The Existing/Baseline and No-Build Alternatives roadway configuration comprises one lane in each direction on Prado Road west of Higuera Street. The Build Alternative would add one lane to Prado Road in each direction resulting in a four-lane roadway, as well as additional turn lanes at the intersection of Prado Road and South Higuera Street. Table 1.4 summarizes traffic conditions at the intersection of Prado Road and Higuera Street. The combined intersection AM and PM peak hour approach volume is 3,969 vehicles for the Existing/Baseline condition, 7,806 vehicles for the No-Build Alternative, and 7,806 vehicles for the Build Alternative. The average peak hour delay ranges from 15.7 to 28.2 seconds for the Existing/Baseline condition, 32.3 to 159.0 seconds for the No-Build Alternative, and 26.9 to 61.4 seconds for the Build Alternative.

Table 1.4. Summary of Long-Term Operational Impacts on Traffic Conditions of Existing, No-Build, and Build Alternatives.

Scenario/ Analysis Year	Traffic Conditions
Existing/Baseline (2018)	The Existing/Baseline condition includes one lane in each direction on Prado Road, west of Higuera Street. The combined intersection AM and PM peak hour approach intersection approach volume is 3,969 vehicles. The average delay ranges from 15.7 to 28.2 seconds.
No-Build Alternative (2035)	The No-Build Alternative includes one lane in each direction on Prado Road, west of Higuera Street. The combined intersection AM and PM peak hour approach intersection approach volume is 7,806 vehicles. The average delay ranges from 32.3 to 159.0 seconds.
Build Alternative (2035)	The Build Alternative includes two lanes in each direction on Prado Road, west of Higuera Street. The combined intersection AM and PM peak hour approach intersection approach volume is 7,806 vehicles. The average delay ranges from 26.9 to 61.4 seconds.

1.5 Construction Activities and Schedule

Construction is anticipated to begin in late 2022 and is expected to take 24 months to complete. A full closure of the bridge is expected to reduce construction costs and duration. While actual Contractor operations are to be determined upon award of the construction contract, project construction could include four primary phases:

- Phase 1: Initiate utility coordination and order long lead-time materials. If needed, modify signal head and detection placement to shift South Higuera Street traffic to the west and construct east-side sidewalk, future signal foundation, and soundwall improvements. If needed, modify signal head and detection placement to shift South Higuera Street traffic to east and construct South Higuera Street widening and business park driveway on west side. Close existing Bob Jones Trail connection on west side of the creek and reconstruct connection, sidewalk, curb, and gutter to be out of future abutment construction area. Conduct clearing and grubbing of top of channel areas to gain access to install cofferdams and stream diversion system. Install stream diversion system and conduct clearing and grubbing of channel areas. Remove the existing Bob Jones Trail bridge. Modify or reconstruct the abutments for the existing Bob Jones Trail bridge. Construct soldier pile walls in creek channel outside of existing bridge limits.

- Phase 2: Close the existing Prado Road bridge and construct new abutments with utility openings and temporary supports for utilities in the channel that are to be supported on the new bridge. Relocate utilities onto temporary supports, as appropriate. The existing gravity sewer line will need to be protected in place during the removal of the vehicular bridge.
- Phase 3: Remove the existing Prado Road bridge and complete construction of retaining walls. Construct new bridge superstructure and approach slabs. Attach utilities to new bridge structure and finalize construction of west-side curb returns, drainage systems, and remaining signal modifications.
- Phase 4: Reopen Prado Road bridge crossing to traffic. Complete regrading of San Luis Obispo Creek, including the placement of RSP. Place the Bob Jones Trail bridge on the reconstructed abutments and install trailhead statue and associated trail connection improvements to the Prado Road/South Higuera Street intersection. Install planting for on-site and off-site mitigation.
- The bridge replacement project will require short-term temporary impacts to the terminus of the Bob Jones Trail near the Prado Road/South Higuera Street intersection. However, access to the Bob Jones Trail is anticipated to be maintained throughout construction. Notice will be provided to surrounding properties/tenants prior to closure of the Prado Road bridge and as needed for specific construction activities.

Table 1.5, below, shows a two-year (24-month) construction period with simplified phasing for input into the air quality model. The table also shows milestone completion dates that were used for air quality modeling. These dates are estimates for planning purposes and for use in the Air Quality Report. The project is located in an attainment/unclassified area for all current National Ambient Air Quality Standards (NAAQS). Therefore, construction-related Transportation Conformity requirements do not apply.

Table 1.5. Construction Activities and Schedule.

Construction Phase	Description/List of Activities	Begin Date	Completion Date
Advertisement and Award of Contract	Procurement	August 2022	November 2022
Demolition & Land Clearing	Remove existing structures in project area and dispose of debris	December 2022	February 2023
Excavation & Grading	Excavate project area foundations, dispose of extracted soil, grade site	February 2023	February 2024
Utilities & Foundation	Install utilities and lay groundwork; Ramp construction	February 2024	July 2024
Paving & Landscaping	Concrete/asphalt pouring and smoothing; landscaping & signage	July 2024	October 2024
End of Construction	Clean-up and equipment removal	November 2024	November 2024

2. Regulatory Setting

Many statutes, regulations, plans, and policies have been adopted at the federal, state, and local levels to address air quality issues related to transportation and other sources. The proposed project is subject to air quality regulations at each of these levels. This section introduces the pollutants governed by these regulations and describes the regulation and policies that are relevant to the proposed project.

2.1 Pollutant-Specific Overview

Air pollutants are governed by multiple federal and state standards to regulate and mitigate health impacts. At the federal level, there are six criteria pollutants for which National Ambient Air Quality Standards (NAAQS) have been established: CO, Pb, NO_2, O_3, PM ($PM_{2.5}$ and PM_{10}), and SO_2. The U.S. EPA has also identified nine priority mobile source air toxics: 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (diesel PM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/). In California, sulfates, visibility reducing particles, hydrogen sulfide, and vinyl chloride are also regulated.

2.1.1 Criteria Pollutants

The Clean Air Act requires the U.S. EPA to set National Ambient Air Quality Standards (NAAQS) for six criteria air contaminants: ozone, particulate matter, carbon monoxide, nitrogen dioxide, lead, and sulfur dioxide. It also permits states to adopt additional or more protective air quality standards if needed. California has set standards for certain pollutants. Table 2.1 documents the current air quality standards while Table 2.2 summarizes the sources and health effects of the six criteria pollutants and pollutants regulated in the state of California.

Table 2.1. Table of State and Federal Ambient Air Quality Standards. Accessed August 1, 2019, www.arb.ca.gov/research/aaqs/aaqs2.pdf.

Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards [1]		National Standards [2]		
		Concentration [3]	Method [4]	Primary [3,5]	Secondary [3,6]	Method [7]
Ozone (O_3)[8]	1 Hour	0.09 ppm (180 µg/m^3)	Ultraviolet Photometry	—	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	0.070 ppm (137 µg/m^3)		0.070 ppm (137 µg/m^3)		
Respirable Particulate Matter (PM10)[9]	24 Hour	50 µg/m^3	Gravimetric or Beta Attenuation	150 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 µg/m^3		—		
Fine Particulate Matter (PM2.5)[9]	24 Hour	—	—	35 µg/m^3	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	12 µg/m^3	Gravimetric or Beta Attenuation	12.0 µg/m^3	15 µg/m^3	
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	Non-Dispersive Infrared Photometry (NDIR)	35 ppm (40 mg/m^3)	—	Non-Dispersive Infrared Photometry (NDIR)
	8 Hour	9.0 ppm (10 mg/m^3)		9 ppm (10 mg/m^3)	—	
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)		—	—	
Nitrogen Dioxide (NO_2)[10]	1 Hour	0.18 ppm (339 µg/m^3)	Gas Phase Chemiluminescence	100 ppb (188 µg/m^3)	—	Gas Phase Chemiluminescence
	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)		0.053 ppm (100 µg/m^3)	Same as Primary Standard	
Sulfur Dioxide (SO_2)[11]	1 Hour	0.25 ppm (655 µg/m^3)	Ultraviolet Fluorescence	75 ppb (196 µg/m^3)	—	Ultraviolet Flourescence; Spectrophotometry (Pararosaniline Method)
	3 Hour	—		—	0.5 ppm (1300 µg/m^3)	
	24 Hour	0.04 ppm (105 µg/m^3)		0.14 ppm (for certain areas)[11]	—	
	Annual Arithmetic Mean	—		0.030 ppm (for certain areas)[11]	—	
Lead[12,13]	30 Day Average	1.5 µg/m^3	Atomic Absorption	—	—	High Volume Sampler and Atomic Absorption
	Calendar Quarter	—		1.5 µg/m^3 (for certain areas)[12]	Same as Primary Standard	
	Rolling 3-Month Average	—		0.15 µg/m^3		
Visibility Reducing Particles[14]	8 Hour	See footnote 14	Beta Attenuation and Transmittance through Filter Tape	No National Standards		
Sulfates	24 Hour	25 µg/m^3	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	Ultraviolet Fluorescence			
Vinyl Chloride[12]	24 Hour	0.01 ppm (26 µg/m^3)	Gas Chromatography			

See footnotes on next page ...

For more information please call ARB-PIO at (916) 322-2990 California Air Resources Board (5/4/16)

1. California standards for ozone, carbon monoxide (except 8-hour Lake Tahoe), sulfur dioxide (1 and 24 hour), nitrogen dioxide, and particulate matter (PM10, PM2.5, and visibility reducing particles), are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.
2. National standards (other than ozone, particulate matter, and those based on annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM10, the 24 hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 $\mu g/m^3$ is equal to or less than one. For PM2.5, the 24 hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard. Contact the U.S. EPA for further clarification and current national policies.
3. Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.
4. Any equivalent measurement method which can be shown to the satisfaction of the ARB to give equivalent results at or near the level of the air quality standard may be used.
5. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health.
6. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
7. Reference method as described by the U.S. EPA. An "equivalent method" of measurement may be used but must have a "consistent relationship to the reference method" and must be approved by the U.S. EPA.
8. On October 1, 2015, the national 8-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 ppm.
9. On December 14, 2012, the national annual PM2.5 primary standard was lowered from 15 $\mu g/m^3$ to 12.0 $\mu g/m^3$. The existing national 24-hour PM2.5 standards (primary and secondary) were retained at 35 $\mu g/m^3$, as was the annual secondary standard of 15 $\mu g/m^3$. The existing 24-hour PM10 standards (primary and secondary) of 150 $\mu g/m^3$ also were retained. The form of the annual primary and secondary standards is the annual mean, averaged over 3 years.
10. To attain the 1-hour national standard, the 3-year average of the annual 98th percentile of the 1-hour daily maximum concentrations at each site must not exceed 100 ppb. Note that the national 1-hour standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the national 1-hour standard to the California standards the units can be converted from ppb to ppm. In this case, the national standard of 100 ppb is identical to 0.100 ppm.
11. On June 2, 2010, a new 1-hour SO_2 standard was established and the existing 24-hour and annual primary standards were revoked. To attain the 1-hour national standard, the 3-year average of the annual 99th percentile of the 1-hour daily maximum concentrations at each site must not exceed 75 ppb. The 1971 SO_2 national standards (24-hour and annual) remain in effect until one year after an area is designated for the 2010 standard, except that in areas designated nonattainment for the 1971 standards, the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standards are approved.

    Note that the 1-hour national standard is in units of parts per billion (ppb). California standards are in units of parts per million (ppm). To directly compare the 1-hour national standard to the California standard the units can be converted to ppm. In this case, the national standard of 75 ppb is identical to 0.075 ppm.
12. The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.
13. The national standard for lead was revised on October 15, 2008 to a rolling 3-month average. The 1978 lead standard (1.5 $\mu g/m^3$ as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978 standard, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.
14. In 1989, the ARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are "extinction of 0.23 per kilometer" and "extinction of 0.07 per kilometer" for the statewide and Lake Tahoe Air Basin standards, respectively.

For more information please call ARB-PIO at (916) 322-2990 **California Air Resources Board (5/4/16)**

Table 2.2. State and Federal Criteria Air Pollutant Effects and Sources.

Pollutant	Principal Health and Atmospheric Effects	Typical Sources
Ozone (O_3)	High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Common precursor emitters include motor vehicles and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.
Respirable Particulate Matter (PM_{10})	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic and other aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations; combustion smoke & vehicle exhaust; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources.
Fine Particulate Matter ($PM_{2.5}$)	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the $PM_{2.5}$ size range. Many toxic and other aerosol and solid compounds are part of $PM_{2.5}$.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical and photochemical reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.
Carbon Monoxide (CO)	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone. Colorless, odorless.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.
Nitrogen Dioxide (NO_2)	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain & nitrate contamination of stormwater. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile or portable engines, especially diesel; refineries; industrial operations.
Sulfur Dioxide (SO_2)	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.
Lead (Pb)	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from older gasoline use may exist in soils along major roads.
Visibility-Reducing Particles (VRP)	Reduces visibility. Produces haze. NOTE: not directly related to the Regional Haze program under the Federal Clean Air Act, which is oriented primarily toward visibility issues in National Parks and other "Class I" areas. However, some issues and measurement methods are similar.	See particulate matter above. May be related more to aerosols than to solid particles.
Sulfate	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.
Hydrogen Sulfide (H_2S)	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea. Strong odor.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.
Vinyl Chloride	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes.

2.1.2 Mobile Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. The U.S. EPA has assessed this expansive list in its rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are part of U.S. EPA's Integrated Risk Information System (IRIS) (https://www.epa.gov/iris). In addition, the U.S. EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers or contributors and non-hazard contributors from the 2011 National Air Toxics Assessment (NATA) (https://www.epa.gov/national-air-toxics-assessment). These are *1,3-butadiene*, *acetaldehyde*, *acrolein*, *benzene*, *diesel particulate matter (diesel PM)*, *ethylbenzene*, *formaldehyde*, *naphthalene*, and *polycyclic organic matter*. While the Federal Highway Administration (FHWA) considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future U.S. EPA rules.

The 2007 U.S. EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using U.S. EPA's MOVES2014a model, even if vehicle activity (vehicle-miles traveled, VMT) increases by 45 percent from 2010 to 2050 as forecast, a combined reduction of 91 percent in the total annual emission rate for the priority MSATs is projected for the same time period, as shown in Figure 2.1.

2.1.3 Greenhouse Gases

The term greenhouse gas (GHG) is used to describe atmospheric gases that absorb solar radiation and subsequently emit radiation in the thermal infrared region of the energy spectrum, trapping heat in the Earth's atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and water vapor, among others. A growing body of research attributes long-term changes in temperature, precipitation, and other elements of Earth's climate to large increases in GHG emissions since the mid-nineteenth century, particularly from human activity related to fossil fuel combustion. Anthropogenic GHG emissions of particular interest include CO_2, CH_4, N_2O, and fluorinated gases.

GHGs differ in how much heat each traps in the atmosphere (global warming potential, or GWP). CO_2 is the most important GHG, so amounts of other gases are expressed relative to CO_2, using a metric called "carbon dioxide equivalent" (CO_2e). The global warming potential of CO_2 is assigned a value of 1, and the warming potential of other gases is assessed as multiples of CO_2. For example, the 2007 International Panel on Climate Change *Fourth Assessment Report* calculates the GWP of CH_4 as 25 and the GWP of N_2O as 298, over a 100-year time horizon.[1] Generally, estimates of all GHGs are summed to obtain total emissions for a project or given time period, usually expressed in metric tons ($MTCO_2e$), or million metric tons ($MMTCO_2e$).[2]

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[1] See Table 2.14 in IPCC Fourth Assessment Report: Climate Change 2007 (AR4): The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M. Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom, and New York, NY, USA. http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf.

[2] See http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/CEQA-Guidance-Tools.

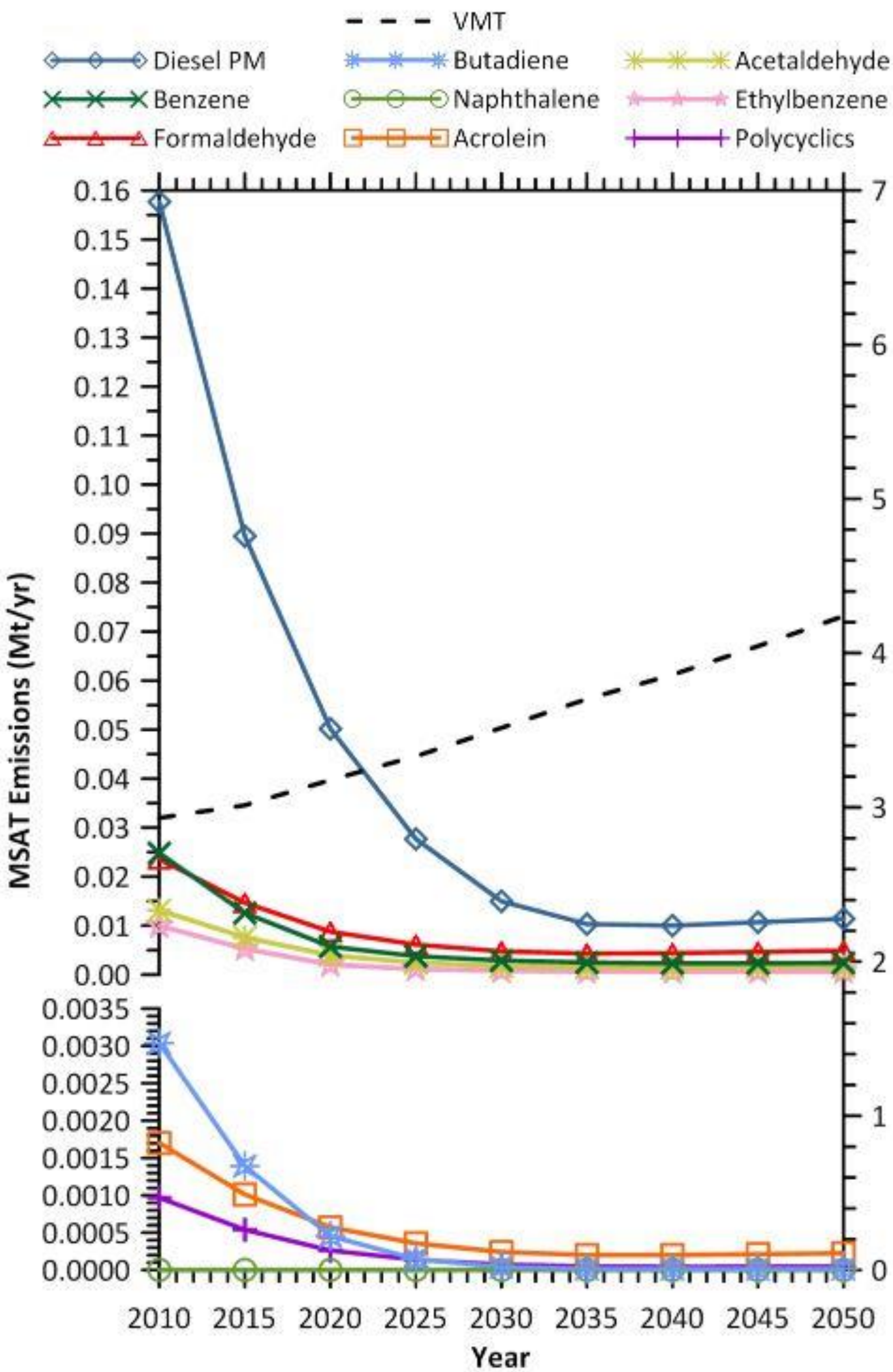

Figure 2.1. Projected National MSAT Trends, 2010-2050 (Source: https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/).

As evidence has mounted for the relationship of climate changes to rising GHGs, federal and state governments have established numerous policies and goals targeted to improving energy efficiency and fuel economy, and reducing GHG emissions. Nationally, electricity generation is the largest source of GHG emissions, followed by transportation. In California, however, transportation is the largest contributor to GHGs.

At the federal level, the National Environmental Policy Act (NEPA) (42 United States Code [USC] Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level. However, the U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) issued the first corporate fuel economy (CAFE) standards in 2010, requiring cars and light-duty vehicles to achieve certain fuel economy targets by 2016, with the intention of gradually increasing the targets and the range of vehicles to which they would apply.

California has enacted aggressive GHG reduction targets, starting with Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 is California's signature climate change legislation. It set the goal of reducing statewide GHG emissions to 1990 levels by 2020, and required the ARB to develop a Scoping Plan that describes the approach California will take to achieve that goal and to update it every 5 years. In 2015, Governor Jerry Brown enhanced the overall adaptation planning effort with Executive Order (EO) B-30-15, establishing an interim GHG reduction goal of 40 percent below 1990 levels by 2030, and requiring state agencies to factor climate change into all planning and investment decisions.

Senate Bill (SB) 375, the Sustainable Communities and Climate Protection Act of 2008, furthered state climate action goals by mandating coordinated transportation and land use planning through preparation of sustainable communities strategies (SCS). The ARB sets GHG emissions reduction targets for passenger vehicles for each region. Each regional metropolitan planning organization must include in its regional transportation plan an SCS proposing actions toward achieving the regional emissions reduction targets.[3]

With these and other State Senate and Assembly bills and executive orders, California advances an innovative and proactive approach to dealing with GHG emissions and climate change.

2.1.4 Asbestos

Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a toxic air contaminant by the ARB in 1986. All types of asbestos are hazardous and may cause lung disease and cancer.

[3] https://www.arb.ca.gov/cc/sb375/sb375.htm

Asbestos can be released from serpentine and ultramafic rocks when the rock is broken or crushed. At the point of release, the asbestos fibers may become airborne, causing air quality and human health hazards. These rocks have been commonly used for unpaved gravel roads, landscaping, fill projects, and other improvement projects in some localities. Asbestos may be released to the atmosphere due to vehicular traffic on unpaved roads, during grading for development projects, and at quarry operations. All of these activities may have the effect of releasing potentially harmful asbestos into the air. Natural weathering and erosion processes can act on asbestos-bearing rock and make it easier for asbestos fibers to become airborne if such rock is disturbed.

Serpentine may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, though much less frequently than serpentinite and/or ultramafic rock. Serpentinite and/or ultramafic rock are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in counties of the Sierra Nevada foothills, the Klamath Mountains, and Coast Ranges. The California Department of Conservation, Division of Mines and Geology has developed a map showing the general location of ultramafic rock in the state (www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos/Pages/index.aspx).

2.2 Regulations

2.2.1 Federal and California Clean Air Act

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act (CCAA) is its companion state law. These laws and related regulations by the U.S. EPA and the (ARB) 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.

2.2.2 Transportation Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation (USDOT) and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) 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 proposed 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. The U.S. EPA regulations at 40 CFR 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 (although not in California), sulfur dioxide (SO_2). California has attainment 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 FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of Regional Transportation Plans (RTPs) and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP), and 4 years (for the FTIP). RTP and FTIP 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 Clean Air Act and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration (FTA), make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the Clean Air Act. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept, scope, and "open-to-traffic" schedule of a proposed transportation project are the same as described in the RTP and the TIP, then the proposed 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 RTP and TIP and the project has a design concept and scope[4] that has not changed significantly from those in the RTP and TIP. If the design concept and scope have changed substantially from that used in the RTP Conformity analysis, RTP and TIP amendments may be needed. Project-level conformity also needs to demonstrate that project analyses have used the latest planning assumptions and U.S. EPA-approved emissions models; the project complies with any control measures in the SIP in PM areas. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

[4] "Design concept" means the type of facility that is proposed, such as a freeway or arterial highway. "Design scope" refers to those aspects of the project that would clearly affect capacity and thus any regional emissions analysis, such as the number of lanes and the length of the project.

2.2.3 National Environmental Policy Act (NEPA)

NEPA requires that policies and regulations administered by the federal government are consistent with its environmental protection goals. NEPA also requires that federal agencies use an interdisciplinary approach to planning and decision-making for any actions that could impact the environment. It requires environmental review of federal actions including the creation of Environmental Documents (EDs) that describe the environmental effects of a proposed project and its alternatives (including a section on air quality impacts).

2.2.4 Local

The U.S. EPA has delegated responsibility to air districts to establish local rules to protect air quality. Caltrans' Standard Specification 14-9.02 (Caltrans, 2015) requires compliance with all applicable air quality laws and regulations including local and air district ordinances and rules. The San Luis Obispo County Air Pollution Control District (SLO County APCD) has jurisdiction over the South Central Coast Air Basin, which includes the entire County and incorporated cities of Paso Robles, Atascadero, Morro Bay, San Luis Obispo, Pismo Beach, Arroyo Grande and Grover Beach.

The most recent air quality management plan is the 2001 Clean Air Plan. The Clean Air Plan outlines the District's strategies to reduce ozone precursor emissions from a wide variety of stationary and mobile sources. SLO County APCD is in the process of developing an Ozone Emergency Episode Plan, which will provide the basis for taking actions when ambient ozone concentrations reach a level that could endanger public. SLO County APCD has established various regulations to control emissions of air pollutants that are codified in its official Rule Book. Regulations that are relevant to the proposed project include, but are not limited to, Rule 401 (Visible Emissions), Rule 402 (Nuisance), Rule 403 (Particulate Matter Emission Standards).

3. Affected Environment

The topography of a region can substantially impact air flow and resulting pollutant concentrations. California is divided into 15 air basins with similar topography and meteorology to better manage air quality throughout the state. Each air basin has a local air district that is responsible for identifying and implementing air quality strategies to comply with ambient air quality standards.

The Prado Road Bridge Replacement project site is located in proximity to the City of San Luis Obispo in San Luis Obispo County, an area within the South Central Coast Air Basin that includes Santa Barbara and Ventura Counties. Air quality regulation in the San Luis Obispo County portion of the South Central Coast Air Basin is administered by the SLO County APCD. Current and forecasted population for San Luis Obispo County is estimated to be 284,010 in 2018 (U.S. Census Bureau, 2018) and forecasted to grow to 315,922 by 2040 and 320,482 by 2050 (SLOCOG, 2019) and the County's economy is largely driven by California Polytechnic State University, agriculture, and tourism.

3.1 Climate, Meteorology, and Topography

Meteorology (weather) and terrain can influence air quality. Certain weather parameters are highly correlated to air quality, including temperature, the amount of sunlight, and the type of winds at the surface and above the surface. Winds can transport ozone and ozone precursors from one region to another, contributing to air quality problems downwind of source regions. Furthermore, mountains can act as a barrier that prevents ozone from dispersing.

The San Luis Obispo Polytech climatological station, maintained by the National Oceanic and Atmospheric Administration, was located near the project site and is representative of meteorological conditions near the project. The period of record is from February 1893 through June 2016. The climate of the project area is generally Mediterranean in character, with cool winters (average 51.8 degrees Fahrenheit in January) and warm, dry summers (average 65.2 degrees Fahrenheit in July). Temperature inversions are common, affecting localized pollutant concentrations in the winter and enhancing ozone formation in the summer. Annual average rainfall is 22.4 inches, mainly falling during the winter months. Wind predominantly blows from the northwest-north-northeast directions and approximately 90 percent of wind speed is under 8 miles per hour.

3.2 Existing Air Quality

This section summarizes existing air quality conditions near the proposed project area. It includes attainment statuses for criteria pollutants, describes local ambient concentrations of criteria pollutants for the past three years, and discusses MSAT and GHG emissions. Figure 3.1 shows the locations of the San Luis Obispo and the Nipomo Monitoring Stations, which are used to characterize existing air quality conditions in the study area. The San Luis Obispo Station monitors O_3 and PM. The Nipomo Station includes NO_2. No other stations have been identified have been identified in San Luis Obispo County that would accurately characterize existing conditions in the project area for other pollutants based on climate, meteorology, and topography.

Figure 3.1. Map of Air Quality Monitoring Stations Located Near the Project.

3.2.1 Criteria Pollutants and Attainment Status

Table 3.1 lists the state and federal attainment status for all regulated pollutants. Under the federal standards, the project area is currently designated attainment or unclassified for all pollutants. For the more stringent CAAQS, the project area is designated nonattainment for O_3 and PM_{10}, and is in attainment of all other state standards.

Table 3.1. State and Federal Attainment Status.

Pollutant	State Attainment Status	Federal Attainment Status
Ozone (O_3)	Nonattainment	Attainment (Western San Luis Obispo County)
Respirable Particulate Matter (PM_{10})	Nonattainment	Attainment – Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Attainment	Attainment – Unclassified
Carbon Monoxide (CO)	Attainment	Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Unclassified
Sulfur Dioxide (SO_2)	Attainment	Unclassified
Lead (Pb)	Attainment	No Attainment Information
Visibility-Reducing Particles	Attainment	N/A
Sulfates	Attainment	N/A
Hydrogen Sulfide	Attainment	N/A
Vinyl Chloride	No Attainment Information	N/A

Source: ARB, State and National Area Designations, October 2020, (https://ww3.arb.ca.gov/desig/adm/adm.htm).

Table 3.2a lists air quality trends in data collected at the San Luis Obispo Monitoring Station for the past three years (2017 to 2019). This Station is located approximately 650 feet northwest of the study area. Monitored data is provided for O_3, PM_{10}, and $PM_{2.5}$. Concentrations were below applicable thresholds for the entire duration. Table 3.2b lists NO_2 collected at the Nipomo Monitoring Station for the past three years (2017 to 2019). This Station is located approximately 18 miles southeast of the study area. Concentrations were below applicable thresholds for the entire duration, except for one PM_{10} exceedance in 2019 and one $PM_{2.5}$ exceedance in 2018. CO is not monitored in San Luis Obispo County. Monitored data from another county would not accurately represent air quality conditions near the project site.

Table 3.2a. Air Quality Concentrations for the Past Three Years Measured at the San Luis Obispo Monitoring Station.

Pollutant	Standard	2017	2018	2019
Ozone				
Max 1-hr concentration		0.074	0.062	0.064
No. days exceeded: State	0.09 ppm	0	0	0
Max 8-hr concentration		0.066	0.053	0.060
No. days exceeded: State Federal	0.070 ppm 0.070 ppm	0 0	0 0	0 0
PM_{10}				
Max 24-hr concentration		70	46	104
No. days exceeded: State Federal	50 $\mu g/m^3$ 150 $\mu g/m^3$	5 0	0 0	1 0
Max annual concentration		18	15	13
No. days exceeded: State	20 $\mu g/m^3$	0	0	0
$PM_{2.5}$				
Max 24-hr concentration		26	38	15
No. days exceeded: Federal	35 $\mu g/m^3$	0	1	0
Max annual concentration		6.8	5.8	5.2
No. days exceeded: State Federal	12 $\mu g/m^3$ 12.0 $\mu g/m^3$	0 0	0 0	0 0

Source: CARB, Air Quality Data Statistics, 2021, (https://www.arb.ca.gov/adam/index.html).

Table 3.2b. Air Quality Concentrations for the Past Three Years Measured at the Nipomo Monitoring Station.

Pollutant	Standard	2017	2018	2019
Nitrogen Dioxide				
Maximum 1-hr Concentration (ppb)		32	25	25
No. days exceeded: State Federal	0.18 ppm 100 ppb	0 0	0 0	0 0
Annual Average Concentration (ppb)		2	2	2
No. days exceeded: State Federal	0.030 ppm 53 ppb	0 0	0 0	0 0

Source: CARB, Air Quality Data Statistics, 2021, (https://www.arb.ca.gov/adam/index.html).

Table 3.3 presents the federal air quality standards attainment designations for the Los Angeles County portion of the South Coast Air Basin. Under the CAAQS, the region is currently designated nonattainment for O_3 and $PM_{2.5}$.

Table 3.3. Status of SIPs Relevant to the Project Area.

Name/Description	Status
Ozone	Attainment: Meets NAAQS
PM_{10}	Attainment – Unclassified: Meets NAAQS
$PM_{2.5}$	Attainment – Unclassified: Meets NAAQS
Carbon Monoxide	Unclassified: Meets NAAQS
Nitrous Dioxide	Unclassified: Meets NAAQS
Sulfur Dioxide	Unclassified: Meets NAAQS
Lead	No Attainment Information

3.2.2 Mobile Source Air Toxics

The primary source of MSAT emissions in the project area is the US 101. ARB monitoring data was reviewed for MSAT concentrations and no monitoring station was identified in San Luis Obispo County. MSAT concentrations outside the County would not be representative of the project area due to differences in traffic conditions, climate, meteorology, and topography.

3.2.3 Greenhouse Gas and Climate Change

CO_2, as part of the carbon cycle, is an important compound for plant and animal life, but also accounted for 84% of California's total GHG emissions in 2015. Transportation, primarily on-road travel, is the single largest source of CO_2 emissions in the state.

The proposed project is located in the City and County of San Luis Obispo, and is included in the 2019 RTP/SCS. This document is the San Luis Obispo region's blueprint for a transportation system that enhances quality of life and meets the mobility needs of the region's residents and visitors, now and in the future. The 2019 RTP/SCS is designed to be adaptable and responsive to change. Performance measures address state and federal reporting requirements to ensure that emissions produced by our transportation system meet the targets established by federal and state agencies over time. The plan also contends with potential impacts of emerging technologies that may lead to pursuing new approaches and strategies, and retiring outdated ones.

The 2019 RTP/SCS estimated mobile source emissions in San Luis Obispo County. In the baseline year of 2015, Countywide mobile source carbon dioxide emissions were estimated to be 2,611 tons per day. Carbon dioxide emissions were further estimated to be 2,529 tons per day in 2020, 2,751 tons per day in 2035 (Preferred Scenario), and 2,852 tons per day in 2045. Per capita carbon dioxide emissions were estimated to be 19.6 pounds per day in 2015, 18.5 pounds per day in 2020, 17.9 pounds per day in 2035 (Preferred Scenario), and 18.2 pounds per day in 2045.

3.3 Sensitive Receptors

On the basis of research showing that the zone of greatest concern near roadways is within 500 feet (or 150 meters), sensitive receptors within 500 feet (or 150 meters) have been identified and are documented in Table 3.4. Figure 3.2 shows the locations of sensitive receptors relative to the project site.

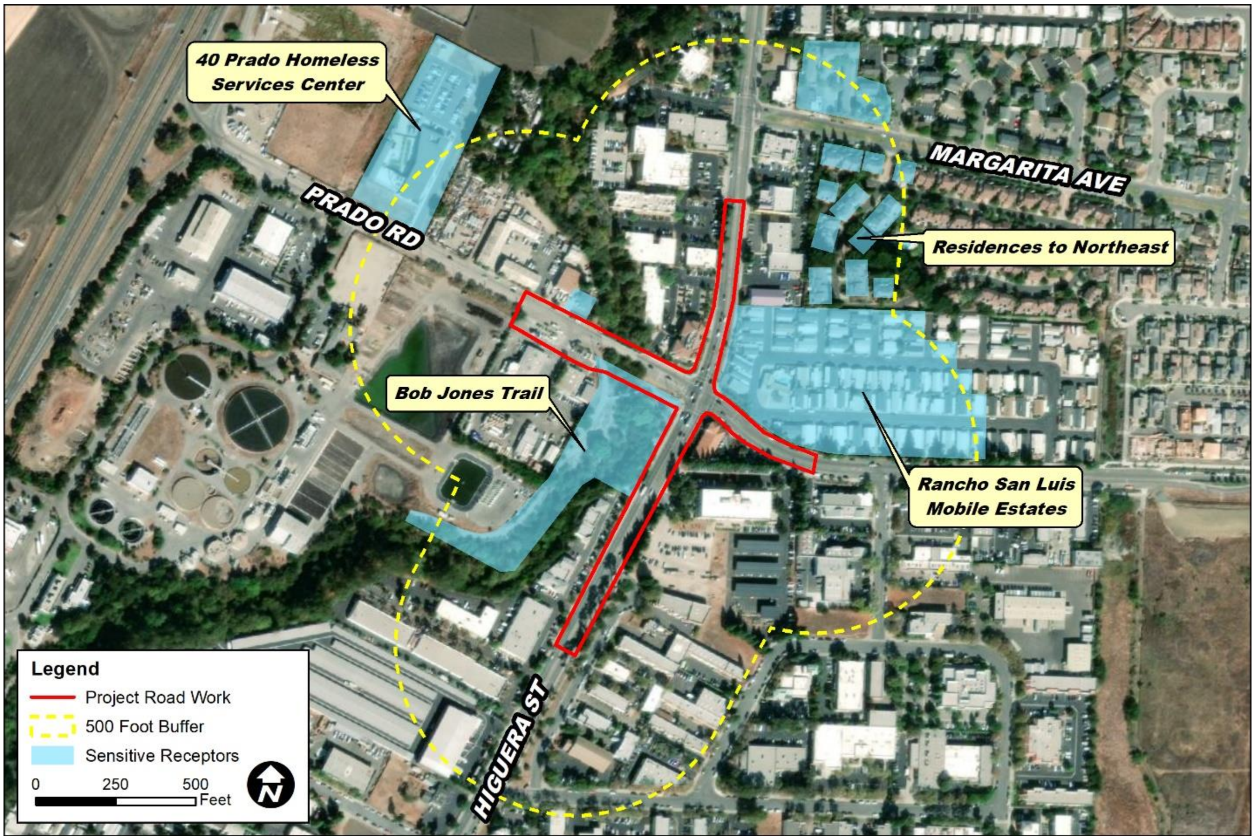

Figure 3.2. Sensitive Receptors Located Near the Proposed Project.

Table 3.4. Sensitive Receptors Located Within 500 of the Project Site.

Receptor	Description	Distance Between Receptor and Project (feet)
Bob Jones Trails	Open Space	Adjacent
Rancho San Luis Mobile Estates to the East	Residences	Adjacent
Single-Family Residence on Prado Road, West of Higuera Street	Residences	Adjacent
Residences to the North East	Residences	230
40 Prado Homeless Services Center	Homeless Services	500

Source: Terry A. Hayes Associates Inc., 2020.

3.4 Conformity Status

3.4.1 Regional Conformity

The project is located in an attainment/unclassified area for all current NAAQS. Therefore, regional Transportation Conformity requirements do not apply. Nonetheless, the project is included in the 2019 RTP (Project ID CEN-RORS-1002). The project listing is included in Appendix A.

3.4.2 Project-Level Conformity

The project is located in an attainment/unclassified area for all current NAAQS. Therefore, project-level Transportation Conformity requirements do not apply.

4. Environmental Consequences

This section describes the methods, impact criteria, and results of air quality analyses of the proposed project. Analyses in this report were conducted using methodology and assumptions that are consistent with the requirements of NEPA and the CAAAs of 1990. The analyses also use guidelines and procedures provided in applicable air quality analysis protocols, such as the FHWA Updated Interim Guidance on Air Toxics Analysis in NEPA Documents (FHWA, 2016).

4.1 Impact Criteria

Project-related emissions will have an adverse environmental impact if they result in pollutant emissions levels that either create or worsen a violation of an ambient air quality standard (identified in Table 2.1 or contribute to an existing air quality violation.

4.2 Short-Term Effects (Construction Emissions)

4.2.1 Construction Equipment, Traffic Congestion, and Fugitive Dust

Site preparation and roadway construction will involve clearing, cut-and-fill activities, grading, removing or improving existing roadways, and paving roadway surfaces. During construction, short-term degradation of air quality is expected from the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Emissions from construction equipment powered by gasoline and diesel engines are also anticipated and would include CO, NO_x, VOCs, directly emitted PM_{10} and $PM_{2.5}$, and toxic air contaminants (TACs) such as diesel exhaust particulate matter. Construction activities are expected to increase traffic congestion in the area, resulting in increases in emissions from traffic during the delays. These emissions would be temporary and limited to the immediate area surrounding the construction site.

Construction is anticipated to begin in June 2022 and is expected to take 24 months to complete. Construction emissions were estimated using the latest Sacramento Metropolitan Air Quality Management District's Road Construction Model (http://www.airquality.org/businesses/ceqa-land-use-planning/ceqa-guidance-tools, Version 9.0). 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 Caltrans and is used for that purpose in this proposed project analysis.

Construction emissions were estimated for the proposed project using default assumptions provided in the Road Construction Model combined with emissions factors from the EMFAC2017 and

OFFROAD models. The equipment was modified from the default assumptions to account for the size of the project area, which limits the simultaneous operation of heavy-duty equipment. Construction-related emissions for the proposed project are presented in Table 4.1. The results of the construction emission calculations are included in Appendix C. The emissions presented are based on the best information available at the time of calculations. The emissions represent the peak daily construction emissions that would be generated by the proposed project.

Table 4.1. Construction Emissions

Phase	ROG (lbs/day)	PM_{10} (lbs/day)	$PM_{2.5}$ (lbs/day)	CO (lbs/day)	NO_x (lbs/day)	CO_2e (lbs/day)
Demolition & Land Clearing	1.0	5.5	1.5	10	12	3,347
Excavation & Grading	2.0	6.0	1.8	16	23	5,638
Utilities & Foundation	1.9	5.9	1.8	20	19	5,116
Paving & Landscaping	0.8	0.5	0.4	11	11	4,181
Maximum daily (lbs/day)	2.0	6.0	1.8	20	23	5,638
Project Total (tons)	*0.45*	*1.3*	*0.41*	*4.1*	*5.0*	*1,336*

Source: Road Construction Model, Version 9.0

Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control, will reduce air quality impacts resulting from construction activities. Please note that although these measures are anticipated to reduce construction-related emissions, these reductions cannot be quantified at this time.

- The construction contractor shall 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.
    - The construction contractor must comply with San Luis Obispo County Air Pollution Control District rules, ordinances, and regulations in regard to air quality restrictions.
- The construction contractor shall apply water or dust palliative to the site and equipment as frequently as necessary to control fugitive dust emissions.
- The construction contractor shall spread soil binder on any unpaved roads used for construction purposes and on all project construction parking areas.
- The construction contractor shall wash off trucks as they leave the right-of-way as necessary to control fugitive dust emissions.
- The construction contractor shall properly tune and maintain construction equipment and vehicles.
- The construction contractor shall use low-sulfur fuel in all construction equipment as provided in California Code of Regulations Title 17, Section 93114.

- The construction contractor shall develop a dust control plan documenting sprinkling, temporary paving, speed limits, and expedited revegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- The construction contractor shall locate equipment and materials storage sites as far away from residential and trail uses as practical. Construction areas shall be kept clean and orderly.
- All on- and off-road diesel equipment shall not idle for more than 5 minutes. The contractor shall post signs in the designated queuing areas and or job sites to remind drivers and operators of the 5-minute idling limit. For non-diesel equipment, idling time for lane closure during construction shall be restricted to 10 minutes in each direction.
- The construction contractor shall use track-out reduction measures, such as gravel pads, at project access points to minimize dust and mud deposits on roads affected by construction traffic.
- The construction contractor shall cover all transported loads of soils and wet materials prior to transport or provide adequate freeboard (space from the top of the material to the top of the truck) to reduce PM_{10} and deposition of particulate matter during transportation.
- The construction contractor shall remove dust and mud that are deposited on paved, public roads due to construction activity and traffic to decrease particulate matter
- The construction contractor shall route and schedule construction traffic to avoid peak travel times as much as possible to reduce congestion and related air quality impacts caused by idling vehicles along local roads.
- The construction contractor shall install mulch or plant vegetation as soon as practical after grading to reduce windblown particulate in the area.

4.2.2 Asbestos

Naturally Occurring Asbestos (NOA)

NOA can be released from serpentinite and ultramafic rocks when the rock is broken or crushed. The State Department of Conservation, in conjunction with the United States Geological Survey, has prepared a map and spreadsheet inventory of asbestos areas and areas known to contain serpentinite and ultraformic rocks.[5] In San Luis Obispo County, serpentine rock is located in many regions of the county including near the project site. Under the CARB's Air Toxics Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations, prior to any grading activities, the construction contractor would be required to comply with the applicable sections contained in the Air Toxics Control Measure. The following requirements apply to projects that propose to grade more than one acre of serpentine rock:

- Submit Project Form with geologic evaluation; and,

[5] U.S Geological Survey, 2011. Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Other Natural Occurrences of Asbestos in California. Available: ftp://ftp.consrv.ca.gov/pub/dmg/pubs/ms/59/MS59_Plate.pdf

- Prepare an Asbestos Dust Mitigation Plan and consult the California Geological Survey and the CARB for more information on naturally occurring asbestos.

The SLO County APCD assesses Review Fees for all work that has the potential to disturb soil containing NOA. The NOA Project Review Fee amount depends upon the project size and if projects involve disturbance of asbestos serpentine, and include dust mitigation plans or air monitoring. Exemptions from requirements are available based on geological evaluation.

Structural Asbestos

Demolition activities may result in exposure to structure asbestos. Various regulatory requirements may apply, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40 Code of Federal Regulations 61, Subpart M – asbestos). These requirements include: 1) Notification to the SLO County APCD; 2) An asbestos survey conducted by a Certified Asbestos Inspector; and 3) Applicable removal and disposal requirements of identified asbestos. The potential for the presence of asbestos would be determined during the utilities survey and the proposed project would be subject to all applicable regulations should it be encountered.

4.2.3 Lead

Lead is normally not an air quality issue for transportation projects unless the proposed project involves disturbance of soils containing high levels of aerially deposited lead or painting or modification of structures with lead-based coatings. No industrial sources of lead emissions have been identified near the project site. Regardless, soils will be tested for the presence of hazardous materials such as lead. If lead is present, the proposed project would be required to develop a Lead Compliance Plan to minimize exposure per SLO County APCD rules and regulations.

4.3 Long-Term Effects (Operational Emissions)

Operational emissions consider long-term changes in emissions due to the proposed project (excluding the construction phase). The operational emissions analysis compares forecasted emissions for Existing/Baseline, No-Build, and Build Alternatives.

Regional operational emissions associated with project implementation were calculated using CT-EMFAC2017. CT-EMFAC2017 contains a comprehensive emissions inventory of motor vehicles that provides estimated emission rates for air pollutants based on various processes involved in vehicle operation. The long-term operational analysis focused on changes in vehicle delay idling to quantify the effects that implementation of the proposed project would have on regional roadway circulation patterns. The idling and running loss emission rates provided by CT-EMFAC2017 in grams per hour were used in conjunction with traffic data presented in Tables 1.1, 1.2, and 1.3 in Section 1.4, above.

Traffic volumes during the AM and PM peak hours were provided for analytical scenario. According to data presented in the Traffic Operations Analysis Report, vehicle volumes within the project area comprise approximately two percent heavy-duty trucks, and 98 percent non-trucks. CT-EMFAC2017 is capable of generating idling and running loss emission rates for heavy-duty truck (Truck 2), light-duty truck (Truck 1), and passenger vehicles and other non-truck (Non-truck) vehicle categories. A project area emission rate in terms of grams of air pollutant emitted per hour of vehicle delay (g/hr) was calculated for 2018 and 2035 by the following equation for each pollutant:

$$EF_i = 0.849 \times EF_{Nontruck,i} + 0.122 \times EF_{Truck1,i} + 0.029 \times EF_{Truck2,i}$$

Where:

EF_i	= Project area emission factor for pollutant i in grams per hour
$EF_{Nontruck,i}$	= Regional emission factor for Nontrucks for pollutant i in grams per hour
$EF_{Truck1,i}$	= Regional emission factor for light-duty trucks for pollutant i in grams per hour
$EF_{Truck2,i}$	= Regional emission factor for heavy-duty trucks for pollutant i in grams per hour
i	= Pollutant (i.e., CO, PM_{10}, $PM_{2.5}$, NO_X, etc.)

Once the project area emission factor was calculated for 2018 and 2035, the appropriate emission factor was used to estimate daily air pollutant emissions from the AM and PM peak hour vehicle delay at each intersection under each alternative. To estimate daily air pollutant emissions, the total vehicle delay in the AM peak hour and PM peak hour was multiplied by two to represent two morning peak hours and two evening peak hours. Emissions of air pollutants at each intersection were calculated using the following equation:

$$E_{k,i} = \frac{2 \times EF_i \times [V_{AM,k} \times D_{avg,AM,k} + V_{PM,k} \times D_{avg,PM,k}]}{3{,}600 \ ^{s}/_{hr} \times 453.592 \ ^{g}/_{lb}}$$

Where:

$E_{k,i}$	= Emissions of pollutant i at intersection k in pounds per day
$EF_{,i}$	= Project area emission factor for pollutant i in grams per hour
$V_{AM,k}$	= AM peak hour volume at intersection k in vehicles per hour
$D_{avg,AM,k}$	= Average AM peak hour vehicle delay in seconds at intersection k
$V_{PM,k}$	= PM peak hour volume at intersection k in vehicles per hour
$D_{avg,AM,k}$	= Average PM peak hour vehicle delay in seconds at intersection k
i	= Pollutant (i.e., CO, PM_{10}, $PM_{2.5}$, NO_X, etc.)

On September 27, 2019, the United States Environmental Protection Agency and the National Highway Traffic Safety Administration published the "Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule Part One: One National Program." (84 Fed. Reg. 51,310 (Sept. 27, 2019.) The Part One Rule revokes California's authority to set its own greenhouse gas emissions standards and set zero-emission vehicle mandates in California. ARB has prepared off-model adjustment factors for EMFAC2017 models to account for the impact of the SAFE Vehicle Rule Part One. ARB prepared guidance for the application of these off-model adjustment factors, published on November 20, 2019 and were approved by the EPA on March 12, 2020. Per ARB's guidance, the off-model adjustment factors were only applied to emissions from gasoline light duty vehicles (LDA, LDT1, LDT2 and MDV) to calculate the adjusted emissions. The off-model adjustment factors are only applicable to the year 2021 and subsequent years; these factors were therefore not applied to emissions for the Baseline/Existing Condition (2018).

Table 4.2 presents the results of the long-term operational emissions analysis based on the AM and PM peak hour delay data and traffic volumes. The potential for impacts is based on the comparison between the Build and No-Build Alternatives per NEPA guidance. The analysis demonstrates that the Build Alternative would result in less criteria pollutant emissions than the No-Build Alternative because of improvements in vehicle delay. The results of the emission calculations are included in Appendix E.

Table 4.2. Summary of Comparative Emissions Analysis.

Scenario/ Analysis Year	CO (pounds / day)	PM_{10} (pounds /day)	$PM_{2.5}$ (pounds /day)	NOx (surrogate for NO_2) (pounds /day)
Baseline/Existing Condition (2018)	3.9	0.021	0.020	7.8
No Build Alternative (2035)	35.7	0.012	0.011	24.3
Build Alternative (2035)	19.3	0.006	0.006	13.2

Source: CT-EMFAC2017

4.3.1 CO Analysis

The CO Protocol was developed for project-level conformity (hot-spot) analysis and was approved for use by the U.S. EPA in 1997. It provides qualitative and quantitative screening procedures, as well as quantitative (modeling) analysis methods to assess project-level CO impacts. The qualitative screening step is designed to avoid the use of detailed modeling for projects that clearly cannot cause a violation, or worsen an existing violation, of the CO standards. Although the protocol was designed to address federal standards, it has been recommended for use by several air pollution control districts in their CEQA analysis guidance documents and is also be valid for California standards because the key criterion (8-hour concentration) is similar: 9 ppm for the federal standard and 9.0 ppm for the state standard.

Sections 3 and 4 of the CO Protocol describe the methodology for determining whether a CO hot-spot analysis is required. The Protocol provides two conformity requirement decision flowcharts that are designed to assist project sponsors in evaluating the requirements that apply to their project. The flowchart of the CO Protocol applies to new projects and was used here. Below is a step-by-step explanation of the flowchart, which is also included in Appendix D. Each level cited is followed by a response, which in turn determines the next applicable level of the flowchart for the project. The step-by-step process shows that a quantitative analysis is not necessary for the Build Alternative because it would not worsen air quality. The Build Alternative would not cause an exceedance of the federal NAAQS for CO or contribute to increasing an existing exceedance (make it worse).

Section 3 – Requirements for New Projects

Two conformity-requirement decision flow charts are provided in the CO Protocol for intersection analyses. The flowcharts are included in Appendix E. An explanatory discussion of the steps used to determine the conformity requirements that apply to the Build Alternative is provided below:

3.1.1 - Is the project exempt from all emissions analyses? No. The Build Alternative is bridge widening project with additional lanes, which is not exempt from all requirements to determine conformity per 40 CFR 93.126.

3.1.2 - Is the project exempt from regional emissions analysis? No. The Build Alternative is not exempt from regional emissions analysis per 40 CFR 93.127.

3.1.3 - Is the project locally defined as regionally significant? Yes. The Build Alternative is defined as regionally significant, as it is included in the 2019 RTP.

3.1.4 - Is the project in a federal attainment area? Yes. The project area is designated as an attainment area for the federal CO standards.

3.1.4a - Is the project in a California attainment area? Yes. The project area is designated as an attainment area for the California CO standards.

3.1.9 - Examine local impacts. Section 3.1.9 of the flowchart directs the project evaluation to Section 4 (Local Analysis) of the CO Protocol.

Section 4 – Local CO Analysis

4.1.1 - Is the project in a CO nonattainment area? No. The Build Alternative is located in a federal attainment area.

4.1.2 - Was the area re-designated as "attainment" after the 1990 Clean Air Act? No. The project area has always been in attainment for CO. Proceed to Level 7.

4.7.1 - Does the project worsen air quality? No. Section 4.7.1 provides criteria that can be satisfied to demonstrate that the project would not worsen air quality. In accordance with the CO Protocol, the Build Alternative would not worsen air quality based on the following evaluation:

a) The project may worsen air quality if it increases the percentage of vehicles operating in cold start mode by 2 percent or more in the affected area.

   The ARB has defined cold starts in the EMFAC2014 Volume II - Handbook for Project-Level Analysis (April 30, 2014). Cold starts are defined as starts after the vehicle engine has been shut-off for more than 720 minutes (12 hours). It can reasonably be assumed that cold starts are by vast majority generated when residents leave their homes in the morning or employees leave work in the evening. The Build Alternative has no nexus to the number of cold starts operating in the project area as at is anticipated that engines would be warm by the time travel occurs on the highway.

   The Traffic Analysis Operations Report does not identify cold starts. The CO Protocol identifies typical ranges for the percent of vehicles operating in cold mode in Table B.6 of Section B.3.2. For expressways, the range is one to three percent during the AM peak hours and one to 20 percent during the PM peak hours. It is anticipated that cold starts in the project area would be within the suggested range of values in the CO Protocol. The precise number for the project area is of no consequence to the CO hot-spot analysis for this particular project. The Build Alternative would have no effect on vehicles operating in cold start mode within the region. There is no potential for the Build Alternative to increase the percentage of vehicles operating in cold start mode.

b) The project may worsen air quality if it significantly increases travel volumes by 5% or more or reduces average vehicle speeds in the affected area.

The traffic analysis assessed VMT and average speed in the AM and PM peak hours, peak periods, and off-peak hours. Traffic conditions for the No Build and Build Alternative for each scenario year are summarized in Table 1.4 Average speeds for AM and PM peak hours and peak periods would be greater under the Build Alternative than the No Build Alternative for each scenario year. The Build Alternative would not increase traffic volumes in excess of 5 percent compared to the No Build Alternative.

c) The project may worsen air quality if the project worsens traffic flow, causing a reduction in average speed or an increase in average delay at an intersection.

The Build Alternative would improve delay from the No Build Alternative, as discussed in Section 1.4.

4.3.2 PM Analysis

Emissions Analysis

PM emissions were estimated for the Existing/Baseline (2018), No-Build (2035), and Build (2035) Alternatives. The potential for impacts is based on the comparison between the Build and No-Build Alternatives per NEPA guidance. The analysis demonstrates that the Build Alternatives would result in less PM emissions than the No-Build Alternative because of improvements in vehicle delay. The results of the emission calculations are included in Appendix E.

Hot-Spot Analysis

In November 2015, the U.S. EPA released an updated version of Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in $PM_{2.5}$ and PM_{10} Nonattainment and Maintenance Areas (Guidance) for quantifying the local air quality impacts of transportation projects and comparing them to the PM NAAQS (75 FR 79370). The U.S. EPA originally released the quantitative guidance in December 2010, and released a revised version in November 2013 to reflect the approval of EMFAC 2011 and U.S. EPA's 2012 PM NAAQS final rule. The November 2015 version reflects MOVES2014 and its subsequent minor revisions such as MOVES2014a, to revise design value calculations to be more consistent with other U.S. EPA programs, and to reflect guidance implementation and experience in the field. Note that EMFAC, not MOVES, should be used for project hot-spot analysis in California. The Guidance requires a hot-spot analysis to be completed for a project of air quality concern (POAQC). The final rule in 40 CFR 93.123(b)(1) defines a POAQC as:

(i) New or expanded highway projects that have a significant number of or significant increase in diesel vehicles;

(ii) Projects affecting intersections that are at Level-of-Service (LOS) D, E, or F with a significant number of diesel vehicles, or those that will change to LOS D, E, or F because of increased traffic volumes from a significant number of diesel vehicles related to the project;

(iii) New bus and rail terminals and transfer points that have a significant number of diesel vehicles congregating at a single location;

(iv) Expanded bus and rail terminals and transfer points that significantly increase the number of diesel vehicles congregating at a single location; and

(v) Projects in or affecting locations, areas, or categories of sites which are identified in the $PM_{2.5}$ and PM_{10} applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

The Build Alternative is located in an attainment area for PM_{10} and $PM_{2.5}$. The proposed project is not considered a POAQC because it does not meet the definition as defined in U.S. EPA's Transportation Conformity Guidance. Therefore, Interagency Consultation and a PM hot-spot analysis is not required. The Build Alternative would not cause an exceedance of the Federal NAAQS for PM_{10} or $PM_{2.5}$ or contribute to increasing an existing exceedance (make it worse).

4.3.3 NO_2 Analysis

The U.S. EPA modified the NO_2 NAAQS to include a 1-hr standard of 100 ppb in 2010. Currently there is no federal project-level nitrogen dioxide (NO_2) analysis requirement. However, NO_2 is among the near-road pollutants of concern and project analysts will be expected to explain how transportation projects affect near-road NO_2.

The Build Alternative is located in an NO_2 attainment area and is included in the SLOCOG RTP. For project-level analysis, NO_2 assessment protocol is not available. EMFAC does not provide NO_2 emissions estimates. Instead, those models provide NOx (combination of NO and NO_2) emissions estimates. Near-road NO_2 concentrations will likely be dominated by overall NO_X emissions. As long as ozone is present at relatively low (background) concentrations, most of the directly emitted NO will convert to NO_2 within a few seconds. Therefore, NO_X emissions overall can serve as a useful analysis surrogate for NO_2. The Caltrans Near-Road Nitrogen Dioxide Assessment Report can be used as a reference (Caltrans, 2012).

NO_2 emissions were estimated for the Existing/Baseline (2018), No-Build (2035), and Build (2035) Alternatives. The potential for impacts is based on the comparison between the Build and No Build Alternatives per NEPA guidance. The analysis demonstrates that the Build Alternatives would result in less NO_2 emissions than the No Build Alternative because of improvements in vehicle delay. The results of the emission calculations are included in Appendix E.

4.3.4 Mobile Source Air Toxics Analysis

FHWA released updated guidance in October 2016 (FHWA, 2016) for determining when and how to address MSAT impacts in the NEPA process for transportation projects. FHWA identified three levels of analysis:

- No analysis for exempt projects or projects with no potential for meaningful MSAT effects;
- Qualitative analysis for projects with low potential MSAT effects; and
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Projects with no impacts generally include those that a) qualify as a categorical exclusion under 23 CFR 771.117, b) qualify as exempt under the FCAA conformity rule under 40 CFR 93.126, and c) are not exempt, but have no meaningful impacts on traffic volumes or vehicle mix.

Projects that have low potential MSAT effects are those that serve to improve highway, transit, or freight operations or movement without adding substantial new capacity or creating a facility that is likely to substantially increase emissions. The large majority of projects fall into this category.

Projects with high potential MSAT effects include those that:

- Create or significantly alter a major intermodal freight facility that has the potential to concentrate high levels of Diesel Particulate Matter in a single location; or
- Create new or add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes with traffic volumes where the AADT is projected to be in the range of 140,000 to 150,000, or greater, by the design year; and
- Are proposed to be located in proximity to populated areas or, in rural areas, in proximity to concentrations of vulnerable populations (i.e., schools, nursing homes, hospitals).

The future year traffic forecasts were developed using the City's Land Use and Circulation Element and subsequent Environmental Impact Reports for development projects. According to the traffic analyses prepared in Central Coast Transportation Consultants in 2018, the AADT volumes along Prado Road between US 101 and South Higuera would be 34,900 vehicles per day by the year 2035. Project area roadway volumes would be well below the 140,000 AADT benchmark for a quantitative analysis.

A qualitative analysis was performed and derived in part from a study conducted by the FHWA entitled, "A Methodology for Evaluating Mobile Source Air Toxic Emissions Among Transportation Project Alternatives," which provided a basis for identifying and comparing the potential differences among MSAT emissions, if any, from the Build and No-Build Alternatives.

For the Build Alternative, the amount of MSATs emitted would be proportional to the vehicle miles traveled, or VMT, assuming that other variables such as fleet mix are the same for each alternative. As discussed above in Section 1.4.3, the Project Build Alternative would substantially reduce congestion and vehicle delay thereby reducing MAST emissions associated with vehicle idling. Furthermore, emissions will likely be lower than present levels in the design year as a result of U.S. EPA's national control programs that are projected to reduce annual MSAT emissions by over 90 percent between 2010 and 2050 (FHWA, 2016). Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases. This proposed project has been determined to generate minimal air quality impacts for FCAA criteria pollutants and has not been linked with any special MSAT concerns.

4.3.5 Greenhouse Gas Emissions Analysis

Regional operational emissions associated with project implementation were calculated using CT-EMFAC2017. CT-EMFAC2017 contains a comprehensive emissions inventory of motor vehicles that provides estimated emission rates for air pollutants. The emission rates provided by CT-EMFAC2017 in grams per mile were used in conjunction with traffic data presented in Tables 1.1 through 1.3 in Section 1.4 above.

Similar to the methodology used to estimate criteria pollutant and ozone precursor emissions, the CO_2 emissions analysis accounts for off-model adjustments associated with the SAFE Rule. Per ARB's guidance, the off-model adjustment factors were only applied to emissions from gasoline light duty vehicles (LDA, LDT1, LDT2 and MDV) to calculate the adjusted emissions. The off-model adjustment factors are only applicable to the year 2021 and subsequent years; these factors were therefore not applied to emissions for the Baseline/Existing Condition (2018).

Table 4.3 shows annual CO_2e emissions produced by peak hour vehicle delay for the Existing/Baseline (2018), No-Build (2035), and Build (2035) Alternatives. Combined AM and PM peak hour CO_2e emissions associated with vehicle delay were multiplied by 347 in accordance with CARB mobile source CO_2e emission inventory methodology. The traffic analysis was based on vehicle delay instead of a VMT analysis that would be used for a corridor project. Therefore, VMT was not estimated for the alternatives. Implementation of the Build Alternative would decrease CO_2e emissions in 2035 compared to the No-Build Alternative. Overall, CO_2e emissions would increase in future years relative to the 2018 Existing/Baseline Condition due to increases in vehicles on the roadways. The emission calculations are included in Appendix E.

Table 4.3. Modeled Annual CO_2e Emissions and Vehicle Miles Traveled, by Alternative.

Alternative	CO_2e Emissions (Metric Tons/Year)
Existing/Baseline (2018)	111
No Build (2035)	730
Build (2035)	395

CO_2e = carbon dioxide equivalent

Source: CT-EMFAC2017

[1] Annual emissions derived from daily values multiplied by 347, per ARB methodology (ARB 2008).

While 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_2e 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_2e emissions. CARB's GHG Inventory follows the IPCC guideline by assuming complete fuel combustion, while still using EMFAC data to calculate CH_4 and N_2O emissions.

4.4 Cumulative/Regional/Indirect Effects

The cumulative impact analysis is conducted based on a summary of projections of future development and impacts contained in an adopted general planning or related planning document, or in a prior environmental document that has been certified. The proposed project is included in the SLOCOG 2019 RTP and 2019 FTIP. The associated Air Quality Conformity Analysis verifies that the 2019 RTP and the 2019 FTIP conform with the latest U.S. EPA transportation conformity regulations and the Conformity SIP. Therefore, there is no potential for the proposed project to interfere with air quality plans that are designed to reduce cumulative air quality impacts in the project area.

In addition, O_3, secondary PM_{10}, and secondary $PM_{2.5}$ are normally regional issues because they are formed by photochemical and chemical reactions over time in the atmosphere. Formation of ozone and secondary PM are a function of VOC and NO_x emissions. As shown in Table 4.2, above, the Build Alternative would result in less VOC and NO_X emissions than either the Existing/Baseline and No-Build Alternatives.

Regarding climate change, an individual project does not generate enough GHG 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 GHG. 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, the incremental impacts of the proposed project must be compared with the effects of past, current, and probable future projects. When compared to the No-Build Alternative, implementation of the Build Alternative would reduce project area vehicle delay during the peak hours and consequently reduce annual GHG emissions in 2035. In addition, the proposed project is listed in the 2019 RTP related to regional management of GHG emissions and is consistent with regional GHG reduction goals.

5. Minimization Measures

5.1 Short-Term (Construction)

Caltrans standard measures are included in Section 4.2.1, Short-Term Effects of this Air Quality Report. No other minimization measures have been identified as necessary to reduce construction emissions. The proposed project would also comply with SLO County APCD rules, including Rule 403 related to particulate matter emissions.

5.2 Long-Term (Operational)

The criteria pollutant analysis in Table 4.2 and the CO_2e analysis in Table 4.3 demonstrate that the proposed project would not meaningfully affect long-term emissions, and in fact regional emissions would decrease with the Build Alternative due to enhanced traffic flow and reduced congestion. No minimization measures have been identified as necessary to reduce long-term emissions.

6. Conclusions

The purpose of this AQR is to inform the NEPA decisions with background information and project-specific analysis related to the project. The findings are as follows:

- **Transportation Conformity** – The project area in Federal Attainment status for all criteria air pollutants and therefore is not subject to Transportation Conformity requirements. The construction period is planned to last approximately two years. Emissions from construction-related activities are thus considered temporary as defined in 40 CFR 93.123(c)(5); and are not required to be included in a PM hot-spot analysis to meet conformity requirements

- **Construction Emissions** – During construction, short-term degradation of air quality is expected from the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other activities related to construction. Implementation of the avoidance, minimization, and/or mitigation measures as described in Section 2.2.6 would minimize construction emissions.

- **Operational Emissions** – Implementation of the Build Alternative would result in daily air pollutant emissions of lesser magnitude than the No Build Alternative due to improvements in vehicle delay. No minimization measures have been identified as necessary to reduce long-term emissions.

- **PM Analysis** - PM emissions were estimated for Existing/Baseline Alternative (2018) along with the No Build and Build Alternatives in 2035. Implementation of the Build Alternative would result in daily PM emissions of lesser magnitude than the No Build Alternative in both 2035 due to improvements in vehicle delay.

- **NO_2 Analysis** - For project-level analysis, an NO_2 assessment protocol is not available and emissions are best assessed as NO_X. As shown in Table 4.3, implementation of the Build Alternative would result in daily NO_X emissions of lesser magnitude than the No Build Alternative due to improvements in vehicle delay. No minimization measures have been identified as necessary to reduce long-term emissions.

- **MSAT Analysis** – Updated Interim Guidance on Mobile Source Air Toxic Analysis in NEPA Documents (FHWA, 2016) recommends a range of options deemed appropriate for addressing and documenting the MSAT issue in NEPA documents. A qualitative analysis was completed that based on the FHWA guidance. The Build Alternative has not been linked with any special MSAT concerns and have been determined to generate minimal air quality impacts for FCCA criteria pollutants. The Build Alternative would not result in changes that would cause an increase in MSAT impacts based on VMT, vehicle mix, and speed. This proposed project has been determined to generate minimal air quality impacts for FCAA criteria pollutants and has not been linked with any special MSAT concerns.

- **GHG Emissions** - The Build Alternative would result in less CO_2e emissions in 2035 due to improved traffic flow when compared to the No Build Alternative. No minimization measures have been identified as necessary to reduce emissions.
- **Cumulative/Regional/Indirect Effects** - The project is included in the SLOCOG 2019 RTP and 2019 FTIP. The associated Air Quality Conformity Analysis verifies that the 2019 RTP and the 2019 FTIP conform with the latest U.S. EPA transportation conformity regulations and the Conformity SIP. 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.

7. References

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8. Appendices

Appendix A RTP and TIP Listings for the Project and FHWA Conformity Determination

Appendix B Summary of Forecast Travel Activities

Appendix C Construction Emissions Calculation

Appendix D CO Flow Chart (Based on the CO Protocol)

Appendix E Summary Tables for Estimated Regional Emissions of GHG, PM, and Other Pollutants