Appendix B Air Quality Report

AIR QUALITY REPORT

State Route 29 (SR-29) Improvements at Rutherford and Oakville Intersections

Napa County, California

04-NAP-29-22.72/24.59
EA 04-2W430/Project ID 421000200

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Prepared for

METROPOLITAN TRANSPORTATION COMMISSION

Caltrans

June 2023

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AIR QUALITY REPORT

NAPA COUNTY, CALIFORNIA

CALIFORNIA DEPARTMENT OF TRANSPORTATION DISTRICT 4

E.A. 04-2W430

Project ID 421000200

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Acronyms and Abbreviations

Term	Definition
AADT	Average annual daily traffic
AB	Assembly bill
ADL	Aerially Deposited Lead
ARB	California Air Resources Board
CAAA	Clean Air Act Amendments
Caltrans	California Department of Transportation
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
CO_2e	Carbon dioxide equivalent
CO Protocol	Transportation Project-Level Carbon Monoxide Protocol
EO	Executive Order
FCAA	Federal Clean Air Act
FHWA	Federal Highway Administration
FMS	Fund Management System
FSTIP	Federal Statewide Transportation Improvement Program
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHG	Greenhouse gas
GWP	Global Warming Potential
H_2S	Hydrogen sulfide
IAC	Interagency Consultation

Term	Definition
IPCC	Intergovernmental Panel on Climate Change
LOS	Level of service
MMT	Million metric tons
MOVES	Motor Vehicle Emission Simulator
mph	Miles per hour
MPO	Metropolitan Planning Organization
MSAT	Mobile Source Air Toxics
MT	Metric tons
MTC	Metropolitan Transportation Commission
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
NOP	Notice of Preparation
NO_x	Nitrogen oxide
NVTA	Napa Valley Transportation Authority
O_3	Ozone
Pb	Lead
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
POAQC	Project of air quality concern
ppb	Parts per billion
ppm	Parts per million
RCEM	Road Construction Emissions Model
ROG	Reactive organic gases

Term	Definition
RTP	Regional Transportation Plan
SB	Senate Bill
SCS	Sustainable Communities Strategy
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SR-29	State Route 29
TIP	Transportation Improvement Program
TOAR	Traffic Operations Analysis Report
USC	United States Code
USDOT	United States Department of Transportation
U.S. EPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
VOCs	Volatile organic compounds

1. Proposed Project Description

1.1 Introduction

The Metropolitan Transportation Commission (MTC), in cooperation with Napa Valley Transportation Authority (NVTA) and the California Department of Transportation (Caltrans), proposes to improve the operation and safety of State Route (SR-29) at the intersections of Oakville Cross Road (PM 22.72) and Rutherford Road (PM 24.59). The proposed project is located along a 2.2-mile segment of SR-29 in an unincorporated area of Napa County. A single-lane roundabout is proposed at the intersection of SR-29 and Oakville Cross Road and installation of a traffic signal and/or other traffic calming measures are proposed at the intersection of SR-29 and Rutherford Road. Caltrans is the National Environmental Policy Act (NEPA) Lead Agency. Caltrans has delegated the MTC as California Environmental Quality Act (CEQA) Lead Agency, with Caltrans acting as a responsible agency.

1.2 Location and Background

The proposed project is located along a 2.2-mile segment of SR-29 in an unincorporated area of Napa County. The project proposes the improvement of two intersections at: SR-29/Rutherford Road (SR-128) in the community of Rutherford and SR-29/Oakville Cross Road in the community of Oakville. Figure 1-1 shows the project location.

The proposed project is included in the MTC's 2023 Transportation Improvement Program (TIP) (TIP ID NAP190007) (MTC, 2022). It is also listed in the Air Quality Conformity Analysis Report for the MTC's Regional Transportation Plan (RTP) for the San Francisco Bay Area, known as Plan Bay Area 2050 (RTP ID 21-T07-056), as an exempt intersection channelization project (MTC and ABAG, 2021).

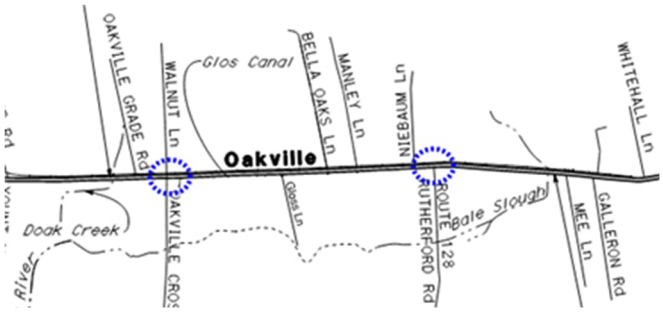

Figure 1-1. Map of the Project Location.

In March 2023, MTC completed a Traffic Operations Analysis Report (TOAR) to identify the causes of and potential solutions to congestion in the greater project vicinity. The results indicated that

enhanced intersection control at the two intersections would improve multimodal traffic operations performance along SR-29. Preliminary crash data analysis provided by Caltrans indicates that the total rate of fatal and injury crash at these two intersections are above the average crash rate for similar facilities statewide. Based on the results of traffic and safety analyses and feedback received from project stakeholders, the implementation of a traffic signal and roundabout are viable options to address the operations and safety needs.

Federal Highway Administration (FHWA) studies indicate that a properly designed roundabout would slow down traffic and, hence, reduce the probabilities of most severe types of intersection crashes and injuries. Roundabouts also allow for continuous flow of traffic at lower speed through this segment of the corridor and would be the ideal candidate to address the safety and operations challenges associated with the corridor.

1.3 Purpose and Need

The purpose of the project is to enhance safety and traffic operations at the intersections of SR-29 and Oakville Cross Road and SR-29 and Rutherford Road.

- Improve travel time and reduce delay for side streets accessing SR-29.
- Enhance traffic safety.
- Improve turning movements.

The intersections under study have been experiencing poor traffic operation and a high number of collisions due to the lack of protected turning movements.

- The number of collisions exceed the statewide average for similar type of facility.
- Poor intersection operation occurs during peak and non-peak periods caused by high traffic volume.
- Lack of protected turning movements to allow for access to and from SR-29 due to insufficient gaps in traffic streaming.

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

The proposed alternatives include the No-Build Alternative and proposed project Build Alternative. These alternatives are discussed below.

1.4.1 Existing Roadways and Traffic Conditions

Under CEQA, the baseline for environmental impact analysis consists of the existing conditions (referred to in this document as Baseline) at the time of the Notice of Preparation (NOP) or at the

time the environmental studies began. The baseline year being used for analysis in this Air Quality Report is 2022, consistent with the TOAR (GHD, 2023).

SR-29 is one of the two major north-south corridors that provides connectivity through the cities of Calistoga, St. Helena, Yountville, Napa, and American Canyon within Napa County. It is a primary freight, agricultural, and commute corridor accessing the San Francisco Bay Area and Sacramento, as well as nearby Solano and Lake Counties. As the gateway to the Napa Valley Wine Country, SR-29 is a main route that brings tens of thousands of tourists to the region each year. Within the project limits, SR-29 between Whitehall Lane and Oakville Cross Road experiences heavy congestion during peak periods. The existing SR-29 corridor is uncontrolled within the project study area. Traffic on SR-29 is not required to stop, creating a continuous traffic flow and leaving no gap for side streets to make turns. Therefore, vehicles at many of the side-street stop-controlled intersection approaches along the corridor experience difficulty turning onto SR-29.

Existing traffic conditions for the study area, which includes a 2.2-mile segment of SR-29 as shown in Figure 1-1, are summarized in Table 1-1. The project is not a capacity enhancing or vehicle miles traveled (VMT)-inducting project; therefore, no VMT analysis was performed for the project pursuant to Caltrans guidance. Posted speed limits for roads within the project study area are presented in Table 1-2.

Table 1-1. Summary of Existing Traffic Conditions.

Scenario/ Analysis Year	Location	AADT		% Truck
		Total	Truck	
Existing/Baseline Year 2022	SR-29 between Oakville Cross Road and Rutherford Road	20,500	328 – 1,661 Average: 1,353	1.6% - 8.1% Average: 6.6%

Notes:
- Percentage of vehicles that are trucks presented as a range to capture traffic data collected during weekday AM, weekday PM, and weekend mid-day peak periods.
- AADT = Average annual daily traffic

Source: TOAR (GHD, 2023)

Table 1-2. Posted Speed Limit Data.

Roadway within Study Area	Posted Speed Limit
SR-29	40-50 mph
Rutherford Road/SR-128	30 mph
Oakville Cross Road	25-30 mph

Source: TOAR (GHD, 2023)

1.4.2 No-Build Alternative

The No-Build (No Action) Alternative consists of those transportation projects that are already planned for construction by or before the project's opening and design years (2025 and 2035, respectively) and the RTP horizon year (2050). Consequently, the No-Build alternative represents future travel conditions in the project study area without the project and is the baseline against which the project Build Alternative will be assessed to meet NEPA requirements.

Under the No-Build Alternative, no improvements are proposed, and the intersection geometries would remain the same as existing conditions. Existing and projected future increases in traffic congestion would not be addressed and traffic volumes would continue to increase.

No-Build traffic conditions for the project opening year (2025), project design year (2035), and RTP horizon year are summarized in Table 1-3. As noted above, the project is not a capacity enhancing or VMT-inducting project; therefore, no VMT analysis was performed for the project pursuant to Caltrans guidance.

Table 1-3. Summary of Future No-Build Traffic Conditions.

Scenario/ Analysis Year	Location	AADT		% Truck
		Total	Truck	
No-Build Year 2025	SR-29 between Oakville Cross Road and Rutherford Road	22,423	359 – 1,816 Average: 1,480	1.6% - 8.1% Average: 6.6%
No-Build Year 2035	SR-29 between Oakville Cross Road and Rutherford Road	24,828	397 – 2,011 Average: 1,639	1.6% - 8.1% Average: 6.6%
No-Build Year 2050	SR-29 between Oakville Cross Road and Rutherford Road	28,916	463 – 2,342 Average: 1,908	1.6% - 8.1% Average: 6.6%

Notes:
- Percentage of vehicles that are trucks assumed to be the same as Existing.
- AADT = Average annual daily traffic

Source: TOAR (GHD, 2023). 2050 values were not available in the TOAR and were extrapolated based on average annual growth rate.

1.4.3 Project Build Alternative

The proposed project would improve the operation and safety of SR-29 at the intersections of Oakville Cross Road (PM 22.72) and Rutherford Road (PM 24.59). A single-lane roundabout is proposed at the intersection of SR-29 and Oakville Cross Road. Due to right-of-way limitations, a roundabout will not be feasible at the Rutherford Road intersection without substantial right-of-way impact. Hence, the project proposes to install a traffic signal and/or other traffic calming measures at the intersection of SR-29 and Rutherford Road.

Oakville Cross Road Intersection

The Oakville roundabout would maintain existing traffic patterns; however, ingress to the Oakville grocery would be modified to right-in and right-out only. The project would not preclude southbound access to the Oakville Grocery driveway (currently a left turn-in); rather traffic would be routed through the roundabout to access the grocery. Construction of the roundabout also would include the installation of intersection lighting, a pedestrian and bicyclist shared use path with bike ramps, and splitter islands with curb ramps. In addition, the existing drainage system would be used to accommodate the proposed roundabout, and the existing signage within the right-of-way would be replaced or upgraded.

The existing channelization at the intersection of SR-29 and Oakville Grade Road may be restriped as part of the mainline improvement required for the construction of a roundabout at the intersection of SR-29 and Oakville Cross Road.

Rutherford Road Intersection

At the Rutherford Road intersection, the project proposes improvements such as a traffic signal, active transportation (improvements include bicyclist and pedestrian facilities that make it safer for pedestrian and bicyclist movements at the intersection), and traffic calming measures along the mainline at the intersection.

Due to the proximity to the Napa Wine Train tracks, railroad crossings improvements will also be needed at both intersections.

The proposed project Build Alternative would not add capacity, increase traffic volumes, or increase the amount of truck traffic in the study area. As such, the traffic data presented in Table 1-3 for the No-Build Alternative is also representative of traffic conditions for the project Build Alternative. The purpose of the project is to enhance safety and traffic operations at the affected intersections, which is anticipated to decrease congestion in the study area and may improve travel time, reduce delay, and increase free-flow speeds.

1.4.4 Comparison of Existing/Baseline and Build Alternative

Average annual daily traffic (AADT) is expected to increase approximately 9 percent by 2025, 21 percent by 2035, and 41 percent by 2050 with the No-Build and proposed project Build Alternatives. The fleet mix (trucks compared to light-duty automobiles) would remain the same as Baseline conditions with the No-Build and Build Alternatives (between 2 and 8 percent). The proposed project Build Alternative would not add capacity, increase traffic volumes, or increase the amount of truck traffic in the study area. The purpose of the project is to enhance safety and traffic operations at the affected intersections, which is anticipated to decrease congestion in the study area and may improve travel time, reduce delay, and increase free-flow speeds.

1.5 Construction Activities and Schedule

Project construction is anticipated to begin in October 2024 and last for approximately 12 months. In order to estimate emissions from construction of the proposed project using the Sacramento Air Quality Management District's Road Construction Model (RCEM), construction activities were characterized for the four default RCEM phases: Grubbing/Land Clearing (including mobilization), Grading/Excavation, Drainage/Utilities/Sub-Grade, and Paving. Details regarding the anticipated construction schedule by phase are presented in Table 1-3. It was assumed that there would be 22 workdays per month. Construction equipment usage and activity assumptions are included in the RCEM input and output, presented in Appendix C.

Table 1-4. Construction Duration by Phase.

Phase	Estimated Start Date	Estimated End Date	Duration
Grubbing/Land Clearing	10/2024	11/2024	1 month
Grading/Excavation	11/2024	4/2025	5 months
Drainage/Utilities/Sub-Grade	4/2025	8/2025	4 months
Paving	8/2025	9/2025	2 months

Source: RCEM phase duration defaults with project start date and overall duration provided by GHD, September 2022.

Oakville Cross Road Intersection

Limits of construction on SR-29 extend approximately 0.5 miles northerly and southerly from the center of the Oakville Cross Road intersection, approximately 500 feet in easterly direction along Oakville Cross Road, and approximately 200 feet in the westerly direction at the existing driveway crossing railroad tracks.

Rutherford Road Intersection

Limits of improvements on SR-29 would extend approximately 0.5 miles northerly and southerly from the center of the Rutherford Road intersection, and approximately 500 feet easterly along Rutherford Road.

Construction activities are not anticipated to last more than five years at any individual site. Emissions from construction-related activities are thus considered temporary as defined in 40 *Code of Federal Regulations* (CFR) 93.123(c)(5); and are not required to be included in particulate matter (PM) hot-spot analyses to meet conformity requirements.

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 regulations 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: carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM) (particulate matter less than 2.5 microns in diameter [$PM_{2.5}$] and particulate matter less than 10 microns in diameter [PM_{10}]), and sulfur dioxide (SO_2). The United States Environmental Protection Agency (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 NAAQS for six criteria air contaminants: O_3, PM ($PM_{2.5}$ and PM_{10}), CO, NO_2, lead, and SO_2. 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 February 2023, 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 ...

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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.

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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 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 Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using U.S. EPA's MOtor Vehicle Emission Simulator (MOVES)2014a model, even if vehicle activity (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.

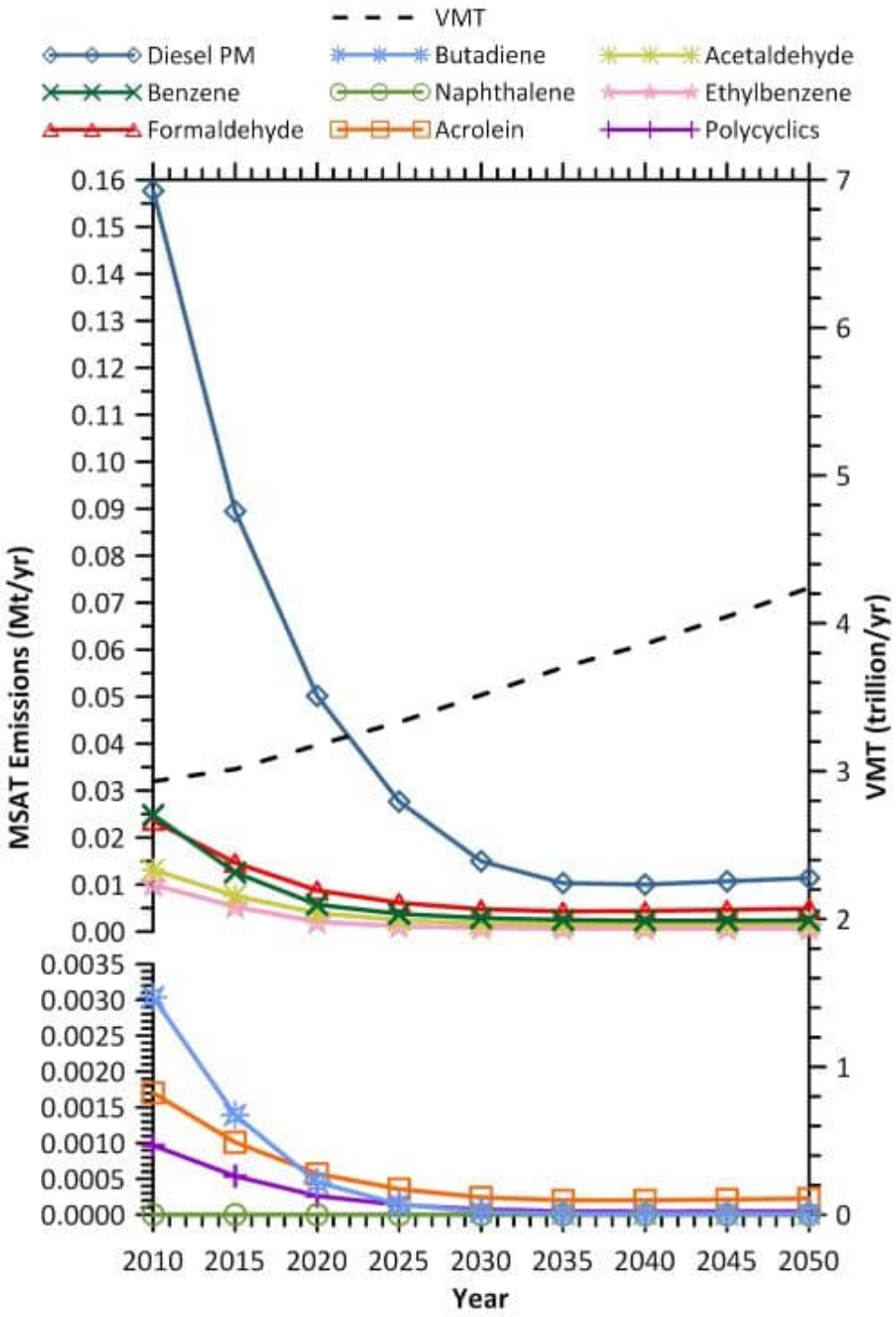

Figure 2-1. Projected National MSAT Trends, 2010-2050.
(Source: https://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/)

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 Intergovernmental Panel on Climate Change (IPCC) *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]

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, 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 California Air Resources Board (ARB) to develop a Scoping Plan that describes the approach

[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.

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 32, approved in September 2016, enacted EO B-30-15 and required the ARB to prioritize emissions reductions to consider the social costs of the emissions of GHGs.

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.

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 (https://www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos).

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

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 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: CO, NO_2, O_3, PM, which is broken down for regulatory purposes into PM_{10} and $PM_{2.5}$, and SO_2. In addition, national and state standards exist for lead, 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 FCAA 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.

Section 107 of the 1977 Clean Air Act Amendments requires that the U.S. EPA publish a list of all geographic areas in compliance with the NAAQS, plus those not in compliance with the NAAQS. Areas not in NAAQS compliance are deemed non-attainment areas. Areas that have insufficient data to make a determination are deemed unclassified and are treated as attainment areas until proven otherwise. An area’s designation is based on the data collected by the state monitoring network on a pollutant-by-pollutant basis.

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 CO, NO_2, O_3, PM (PM_{10} and $PM_{2.5}$), and in some areas (although not in California), 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; however, lead is not

currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of 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 the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA 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 FCAA. 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.

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 that describe the environmental effects of a proposed project and its alternatives (including a section on air quality impacts).

2.2.4 California Environmental Quality Act (CEQA)

CEQA[5] is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible. CEQA documents address CCAA requirements for transportation projects. While state standards are often more strict than federal standards, the state has no conformity process.

[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.

[5] For general information about CEQA, see: http://resources.ca.gov/ceqa/more/faq.html.

2.2.5 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.

Bay Area Air Quality Management District

The BAAQMD attains and maintains air quality conditions in the San Francisco Bay Area Air Basin through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of the BAAQMD includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The BAAQMD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the FCAA, CAAA, and the CCAA (BAAQMD, 2017a).

In 2017, the BAAQMD released the latest update to its CEQA Guidelines. This is an advisory document that provides the Lead Agency, consultants, and project applicants with uniform procedures for addressing air quality in environmental documents. The handbook contains the following applicable components:

1. Criteria and thresholds for determining whether a project may have a significant adverse air quality impact;
2. Specific procedures and modeling protocols for quantifying and analyzing air quality impacts;
3. Methods available to mitigate air quality impacts;
4. Information for use in air quality assessments and environmental documents that will be updated more frequently such as air quality data, regulatory setting, climate, topography (BAAQMD, 2017a).

In April 2022, the BAAQMD adopted *CEQA Thresholds for Evaluating the Significance of Climate Impacts from Land Use Projects and Plans*. This document presents thresholds of significance for use in determining whether a proposed project will have a significant impact on climate change and provides the substantial evidence that lead agencies will need to support their use of these thresholds. The BAAQMD is in the process of preparing Updated CEQA Guidelines for applying these thresholds of significance (BAAQMD, 2022).

Air Quality Plans

As stated above, the BAAQMD prepares plans to attain ambient air quality standards in the San Francisco Bay Area Air Basin. The BAAQMD prepares ozone attainment plans for the national ozone

standard and clean air plans for the California standard both in coordination with the MTC and the Association of Bay Area Governments (ABAG) (BAAQMD, 2017a).

In April 2017, the BAAQMD adopted the 2017 Clean Air Plan, which provides a regional strategy to protect public health and protect the climate. To protect public health, the plan describes how the BAAQMD will continue progress toward attainment of all state and federal air quality standards and elimination of health risk disparities from exposure to air pollution among Bay Area communities. To protect the climate, the plan defines a vision for transitioning the region to a post-carbon economy needed to achieve ambitious GHG reduction targets for 2030 and 2050, and provides a regional climate protection strategy that will put the Bay Area on a pathway to achieve those GHG reduction targets (BAAQMD, 2017b).

The 2017 Clean Air Plan includes a wide range of control measures designed to decrease emissions of the air pollutants that are most harmful to Bay Area residents, such as PM, ozone, and toxic air contaminants; to reduce emissions of methane and other "super-GHGs" that are potent climate pollutants in the near-term; and to decrease emissions of CO_2 by reducing fossil fuel combustion (BAAQMD, 2017b).

3. Affected Environment

The topography of a region can substantially impact air flow and resulting pollutant concentrations. California is divided into 15 air basins of 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 SR-29 Improvements at Rutherford and Oakville Intersections project site is located in proximity to the communities of Rutherford and Oakville in Napa County, an area within the San Francisco Bay Area Air Basin, which also includes Alameda, Contra Costa, Marin, San Francisco, San Mateo, Santa Clara, Solano, and Sonoma Counties. Air quality regulation in San Francisco Bay Area Air Basin is administered by the BAAQMD. Current population for Napa County is 138,000 based on 2020 Census Data (U.S. Census Bureau, 2020).

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 Napa Valley is bordered by relatively high mountains. With an average ridge line height of about 2000 feet, with some peaks approaching 3000 to 4000 feet, these mountains are effective barriers to

the prevailing northwesterly winds. The Napa Valley is widest at its southern end and narrower in the north (BAAQMD, 2017a).

During the day, the prevailing winds flow up valley from the south about half of the time. A strong up valley wind frequently develops during warm summer afternoons, drawing air in from the San Pablo Bay. Daytime winds sometimes flow down valley from the north. During the evening, especially in the winter, down valley drainage often occurs. Wind speeds are generally low, with almost 50 percent of the winds less than 4 miles per hour (mph). Only 5 percent of the winds are between 16 and 18 mph, representing strong summertime up valley winds and winter storms (BAAQMD, 2017a).

Summer average maximum temperatures are in the low 80's at the southern end of the valley and in the low 90's at the northern end. Winter average maximum temperatures are in the high- 50's and low-60's, and minimum temperatures are in the high to mid-30's with the slightly cooler temperatures in the northern end (BAAQMD, 2017a).

The air pollution potential in the Napa Valley could be high if there were sufficient sources of air contaminants nearby. Summer and fall prevailing winds can transport ozone precursors northward from the Carquinez Strait Region to the Napa Valley, effectively trapping and concentrating the pollutants when stable conditions are present. The local upslope and downslope flows created by the surrounding mountains may also recirculate pollutants already present, contributing to buildup of air pollution. High ozone concentrations are a potential problem to sensitive crops such as wine grapes, as well as to human health. The high frequency of light winds and stable conditions during the late fall and winter contribute to the buildup of particulate matter from motor vehicles, agriculture and wood burning in fireplaces and stoves (BAAQMD, 2017a).

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 3 years, and discusses MSAT and GHG emissions.

3.2.1 Criteria Pollutants and Attainment Status

Table 3-1 lists the state and federal attainment status for all regulated pollutants. The proposed project is located in an area that is nonattainment for the 2008 federal ozone standard, the 2015 federal ozone standard, and the 2006 federal $PM_{2.5}$ standard. Additionally, the proposed project area is nonattainment for the state ozone, PM_{10}, and $PM_{2.5}$ standards.

Table 3-2 lists air quality trends in data collected at Napa-Valley College for the past 3 years. The Napa-Valley College station is the closest monitoring station to the project site, located 13 miles to the southeast (Figure 3-1). Several exceedances of the State 1-hour ozone, State and Federal 8-hour ozone, State 24-hour PM_{10} and Federal 24-hour $PM_{2.5}$ standards were recorded during the 2019 – 2021 period.

The applicable SIP is the Bay Area Air Quality Conformity Protocol (MTC Resolution No. 3757). The most recent SIP revision was adopted in April 2020, approved by ARB in May 2021, and submitted to the U.S. EPA for final action (MTC and ABAG, 2021).

Table 3-1. State and Federal Attainment Status.

Pollutant	State Attainment Status	Federal Attainment Status
Ozone (O_3)	Nonattainment	Marginal Nonattainment
Respirable Particulate Matter (PM_{10})	Nonattainment	Attainment-Unclassified
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment	Moderate Nonattainment
Carbon Monoxide (CO)	Attainment	Attainment-Unclassified
Nitrogen Dioxide (NO_2)	Attainment	Attainment-Unclassified
Sulfur Dioxide (SO_2)	Attainment	Attainment-Unclassified
Lead (Pb)	Attainment	Attainment-Unclassified
Visibility-Reducing Particles	Unclassified	N/A
Sulfates	Attainment	N/A
Hydrogen Sulfide	Unclassified	N/A
Vinyl Chloride	N/A	N/A

Source: ARB, http://www.arb.ca.gov/desig/adm/adm.htm

Table 3-2. Air Quality Concentrations for the Past 3 Years Measured at Napa-Valley College.

Pollutant	Standard	2019	2020	2021
Ozone				
Max 1-hr concentration		0.095	0.091	0.070
No. days exceeded: State	0.09 ppm	1	0	0
Max 8-hr concentration: State		0.077	0.077	0.064
Federal		0.076	0.076	0.064
No. days exceeded: State	0.070 ppm	2	1	0
Federal	0.070 ppm	2	1	0
PM_{10}				
Max 24-hr concentration: State		39.0	125.0	24.0
Federal		37.5	122.9	22.9
No. days exceeded: State	50 µg/m^3	0	2	0
Federal	150 µg/m^3	0	0	0
Annual average concentration		*	19.0	*
No. days exceeded: State	20 µg/m^3	-	-	-
$PM_{2.5}$				

Pollutant	Standard	2019	2020	2021
Max 24-hr concentration		21.5	148.5	17.6
No. days exceeded: Federal	35 µg/m^3	0	14.7	*
Annual average concentration: State		6.0	10.4	*
Federal		5.9	10.3	*
No. days exceeded: State	12 µg/m^3	-	-	-
Federal	12.0 µg/m^3	-	-	-
Nitrogen Dioxide				
Max 1-hr concentration: State		36	29	29
Federal		36.6	29.9	29.0
No. days exceeded: State	0.18 ppm	0	0	0
Federal	100 ppb	0	0	0
Annual average concentration: State		4	4	*
Federal		-	-	-
No. days exceeded: State	0.030 ppm	-	-	-
Federal	53 ppb	-	-	-

Notes:

2022 data is not yet available from ARB.

* Insufficient data available to determine the value

- Not available

Source: California Air Resources Board: http://www.arb.ca.gov/adam/welcome.html

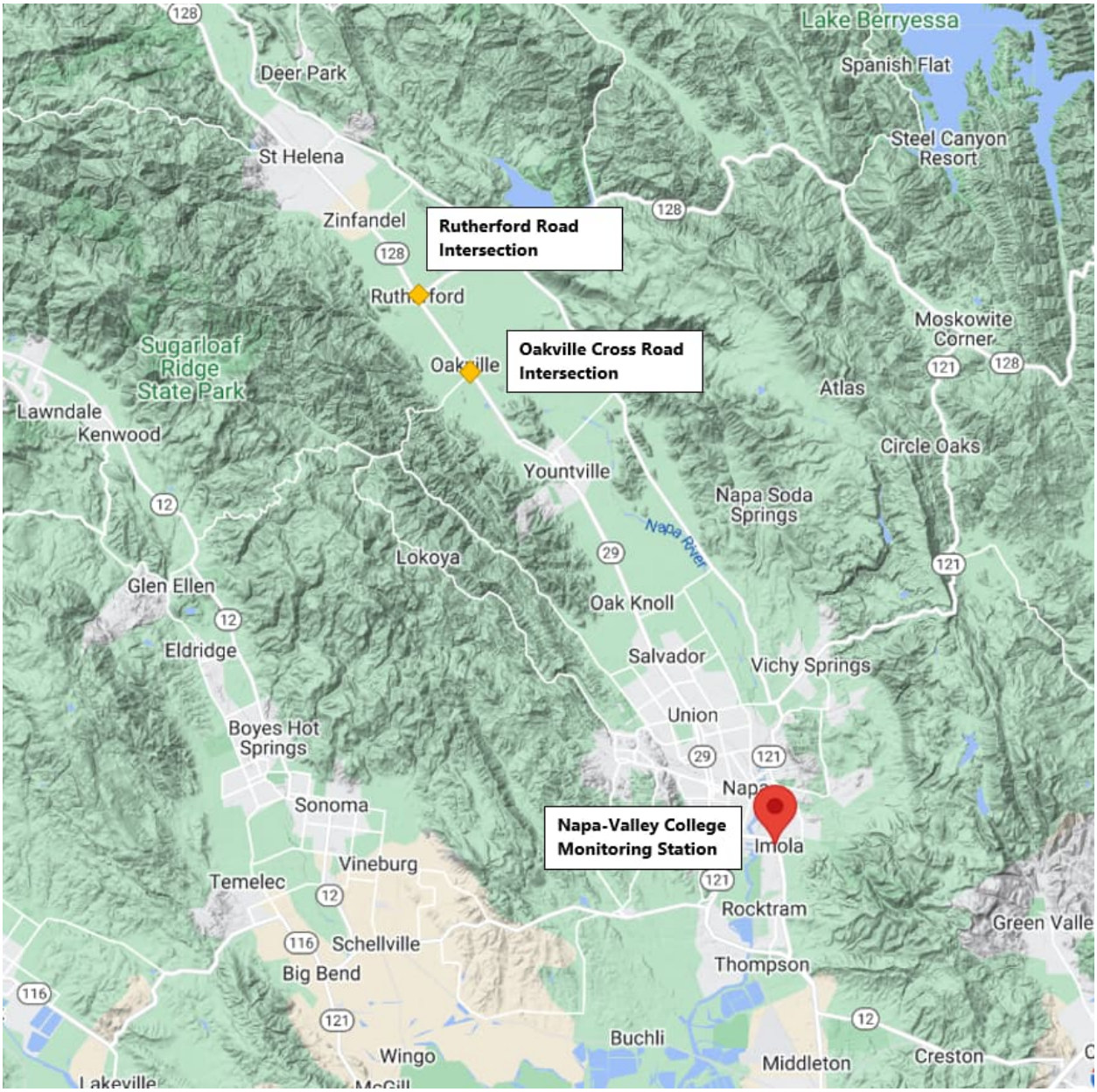

Figure 3-1. Projected Bay Area GHG Emissions by Sector Based on State Policies.
(Source: California Air Resources Board: http://www.arb.ca.gov/adam/welcome.html)

3.2.2 Mobile Source Air Toxics

Sources of emissions of priority MSAT pollutants in the project area are from passenger and freight vehicles traveling on roadways. There are no other nearby facilities that serve on- or off-road motor vehicles, such as rail yards or transit terminals. There is no ambient MSAT concentration data available in the project vicinity (ARB, 2023).

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 Napa County, in the northern part of the 9-county region covered by the Plan Bay Area 2050, MTC's RTP/SCS for the San Francisco Bay Area. In 2017, the BAAQMD adopted the *2017 Clean Air Plan: Spare the Air, Cool the Climate*, which provides a regional strategy to protect public health and the climate in the Bay Area (BAAQMD, 2017b). According to the 2015 GHG inventory in the *2017 Clean Air Plan*, the transportation sector contributed 40 percent of the estimated CO_2e GHG emissions in the Bay Area that year. Figure 3-2 shows estimated changes in GHG emissions since 1990 and projected emissions through 2050 by sector, accounting for adopted and expected GHG reduction policies and regulations.

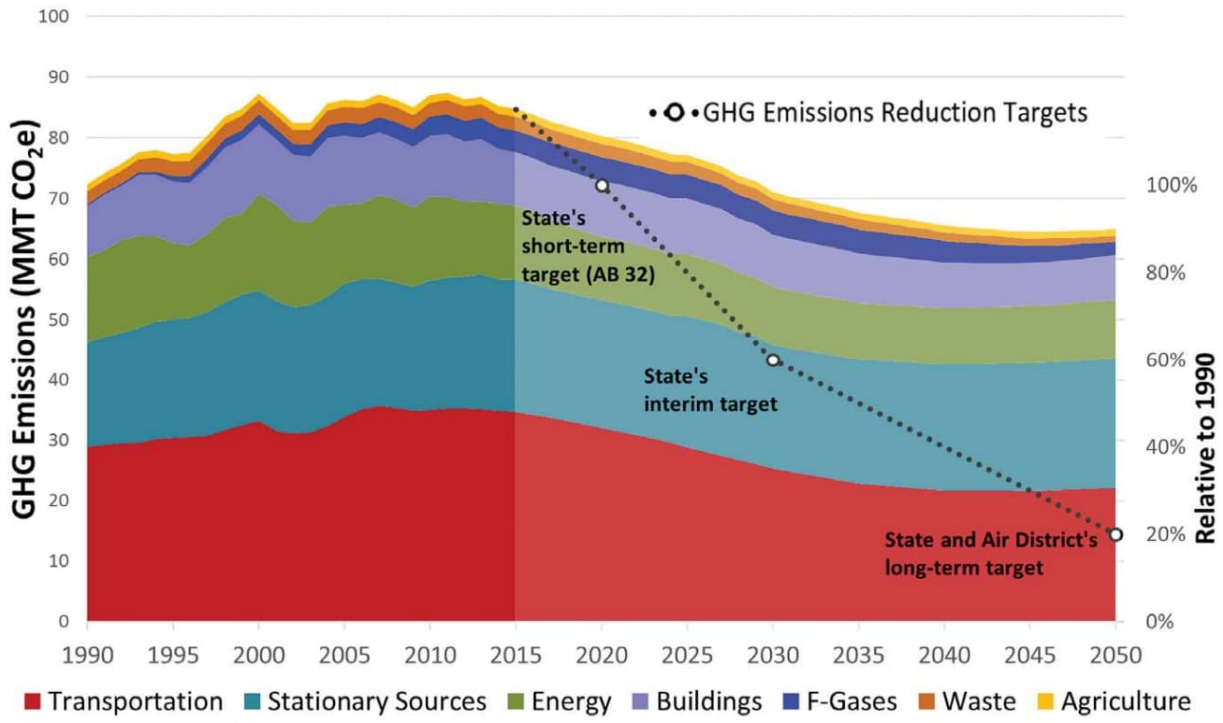

Figure 3-2. Projected Bay Area GHG Emissions by Sector Based on State Policies.
(Source: BAAQMD, 2017b: Figure 3-9)

3.3 Sensitive Receptors

Sensitive populations (sensitive receptors) are more susceptible to the effects of air pollution than the general population. Sensitive populations that are in proximity to localized sources of toxics are

of particular concern. Sensitive receptors for air quality include residential areas, schools, hospitals, other health care facilities, child/day care facilities, parks, and playgrounds. Research shows that the zone of greatest concern near roadways is within 500 feet (or 150 meters). Sensitive receptors within 500 feet (or 150 meters) of the two intersections affected by the proposed project include single family homes.

3.4 Conformity Status

Transportation Conformity applies in areas that are “nonattainment” or “attainment-maintenance” for the NAAQS, and only for the standards that are or previously were violated. Conformity analysis and determinations are done at regional and project-level scales.

3.4.1 Regional Conformity

The proposed project is located within the NVTA planning area. Intersection channelization and intersection signalization projects are exempt from regional conformity requirements (40 CFR 93.127). Separate listing of the project in the RTP and TIP, and their regional conformity analyses, is not necessary. The project would not interfere with timely implementation of Transportation Control Measures identified in the applicable SIP and regional conformity analysis.

While not required, the proposed project is included in the MTC’s 2023 TIP (TIP ID NAP190007), which is included in Caltrans’ 2023 Federal Statewide Transportation Improvement Program (FSTIP) by reference (MTC, 2022). It is also listed in the Air Quality Conformity Analysis Report for the MTC’s RTP for the San Francisco Bay Area, known as Plan Bay Area 2050 (RTP ID 21-T07-056) (MTC and ABAG, 2021). The proposed project is identified as exempt from regional conformity analysis per 40 CFR 93.127 because it is an intersection channelization project, and as such, does not need to be individually considered in the regional conformity modeling. Excerpts of relevant pages from the RTP and TIP are included in Appendix A.

3.4.2 Project-Level Conformity

The project is located in Napa County, which is in nonattainment for $PM_{2.5}$, thus a project-level hot-spot analysis for $PM_{2.5}$ is required under 40 CFR 93.109. As discussed in the following sections, the project does not cause or contribute to any new localized CO, $PM_{2.5}$, and/or PM_{10} violations, or delay timely attainment of any NAAQS or any required interim emission reductions or other milestones during the timeframe of the transportation plan (or regional emissions analysis).

3.4.3 Interagency Consultation

The interagency consultation (IAC) process for project-level conformity involves the following steps:

1. Project proponent completes and submits the "Project Assessment Form" and "Example Assessment Form Cover Page" for task force review. Project proponent may also prepare an optional PowerPoint presentation for review during the consultation meeting.

2. Project proponent attends a consultation meeting with the air quality conformity task force members (U.S. EPA, FHWA, Caltrans and FTA). Consultation meetings are held the fourth Thursday of each month.

3. Task force determines whether the project is a project of air quality concern (POAQC). If the project is determined not to be a POAQC, the project has completed the project-level conformity process and this information is updated in MTC's Fund Management System (FMS). FMS then generates an email confirming the completion of the process and this email is used for the environmental documentation for Caltrans' field reviews.

The project was presented to the air quality conformity task force on February 23, 2023, and IAC participants concurred that the project is not a POAQC. Documentation confirming completion of the IAC process is included in Appendix B.

3.5 NEPA Analysis/Requirement

NEPA applies to all projects that receive federal funding or involve a federal action. NEPA requires that all reasonable alternatives for the project are rigorously explored and objectively evaluated. The air quality analysis addresses federal criteria pollutants (O_3, $PM_{2.5}$, PM_{10}, CO, NO_2, SO_2, and lead), MSATs, and asbestos. Emissions from the future year Build Alternative were compared to those from the future year No-Build Alternative.

3.6 CEQA Analysis/Requirement

CEQA applies to most California transportation projects (certain projects are statutorily exempt). The air quality analysis addresses pollutants for which California has established air quality standards (O_3, PM_{10}, $PM_{2.5}$, carbon monoxide, NO_2, SO_2, lead, visibility-reducing particles, sulfates, H_2S, and vinyl chloride), as well as GHGs, MSATs, and asbestos. Emissions from the future year Build Alternative were compared to emissions from the Baseline (existing conditions). The difference between the future No-Build Alternative and Build Alternative were also presented to help inform significance determinations.

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, CEQA, the CAAAs of 1990, and the CCAA of 1988. The analyses also use guidelines and procedures provided in applicable air quality analysis protocols, such as the Transportation Project-Level Carbon Monoxide Protocol (CO Protocol) (Garza et al., 1997), Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM_{10} and $PM_{2.5}$ Nonattainment and Maintenance Areas (U.S. EPA, 2021), and the FHWA Updated Interim Guidance on Air Toxics Analysis in NEPA Documents (FHWA, 2023).

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.

Additionally, the project will have an adverse environmental impact if GHG emissions are generated directly or indirectly that may have a significant impact on the environment, or that would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions.

4.2 Short-Term Effects (Construction Emissions)

4.2.1 Construction Equipment, Traffic Congestion, and Fugitive Dust

During construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities. Emissions from construction equipment also are expected and would include CO, nitrogen oxide (NO_X), volatile organic compounds (VOCs) / reactive organic gasses (ROG), SO_2, directly emitted PM_{10} and $PM_{2.5}$, and toxic air contaminants such as diesel exhaust particulate matter. Diesel exhaust particulate matter is a California-identified toxic air contaminant, and localized issues may exist if diesel-powered construction equipment is operated near sensitive receptors. Ozone is a regional pollutant that is derived from NO_X and VOCs in the presence of sunlight and heat.

Site preparation and roadway construction would involve clearing, cut-and-fill activities, grading, existing asphalt removal, and paving of roadway surfaces. Construction-related effects on air quality would be greatest during the site preparation phase because most engine emissions are associated with the excavation, handling, and transport of soils to and from the site. These activities could

temporarily generate enough PM_{10}, $PM_{2.5}$, and small amounts of CO, SO_2, NO_X, and VOCs to be of concern.

Sources of fugitive dust associated with construction of the proposed project would include disturbed soils at the construction site and trucks carrying uncovered loads of soils. Unless properly controlled, vehicles leaving the site could deposit mud on local streets, which could be an added source of airborne dust after it dries. PM_{10} emissions would vary from day to day, depending on the nature and magnitude of construction activity and local weather conditions. PM_{10} emissions depend on soil moisture, silt content of soil, wind speed, and the amount of equipment operating. Larger dust particles would settle near the source, while fine particles would be dispersed over greater distances from the construction site.

Construction activities for large development projects are estimated by the U.S. EPA to add 1.2 tons of fugitive dust per acre of soil disturbed per month of activity. If water or other soil stabilizers are used to control dust, the emissions can be reduced by up to 50 percent. The Department's Standard Specifications (Section 14-9.03) on dust minimization requirements requires use of water or dust palliative compounds and will reduce potential fugitive dust emissions during construction.

In addition to dust related PM_{10} emissions, heavy-duty trucks and construction equipment powered by gasoline and diesel engines would generate CO, SO_2, NO_X, VOCs and some soot particulate (PM_{10} and $PM_{2.5}$) in exhaust emissions. Construction activities are expected to increase traffic congestion in the area, resulting in increases in CO and other emissions from traffic during the delays. These emissions would be temporary and limited to the immediate area surrounding the construction site.

SO_2 is generated by oxidation during combustion of organic sulfur compounds contained in diesel fuel. Under California law and ARB regulations, off-road diesel fuel used in California must meet the same sulfur and other standards as on-road diesel fuel (not more than 15 parts per million [ppm] sulfur), so SO_2-related issues due to diesel exhaust will be minimal.

Some phases of construction, particularly asphalt paving, may result in short-term odors in the immediate area of each paving site. Such odors would quickly disperse to below detectable levels as distance from the site increases.

Construction activities would last for approximately 12 months. As they will not last for more than 5 years at one general location, construction-related emissions do not need to be included in regional and project-level conformity analysis (40 CFR 93.123(c)(5)).

For disclosure purposes, construction-related emissions associated with the proposed project have been estimated using SMAQMD's RCEM, version 9.0.1 (SMAQMD, 2022). The RCEM was developed by SMAQMD and is used to analyze construction emissions for roadway projects throughout California. Project-specific construction activity details and assumptions are presented in Section 1.5.

Construction emissions calculated using RCEM were adjusted to account for the Safer Affordable Efficient (SAFE) Vehicle Rule Part Two using off-model adjustment factors developed by ARB (ARB, 2020). ARB developed the factors to account for the impact of the rule, which revoked California's authority to set its own GHG emission standards and set zero emission vehicle mandates. The off-model adjustment factors apply to gasoline light duty vehicle CO_2 emissions in EMFAC2014 and EMFAC2017. RCEM utilizes on-road emission factors from EMFAC2017; therefore, ARB's adjustment

factors have been applied to CO_2 emissions from gasoline light duty vehicle trips (i.e. construction worker commute trips).

The estimated short-term emissions from construction are presented by project phase in Table 4-1. RCEM input and output details are provided in Appendix C.

Table 4-1. Estimated Short-term Construction Emissions

Phase	ROG	NO_X	CO	Total PM_{10}[1]	Total $PM_{2.5}$[1]	CO_2e
Daily Emissions (pounds/day)						
Grubbing/Land Clearing	1.07	9.37	10.74	2.43	0.79	2,386
Grading/Excavation	4.68	45.95	44.71	3.95	2.15	10,041
Drainage/Utilities/ Sub-Grade	2.85	26.42	29.41	3.14	1.45	5,907
Paving	1.39	13.11	18.39	0.66	0.57	3,388
Maximum (pounds/day)	4.68	45.95	44.71	3.95	2.15	10,041
Total Emissions (tons/MT)[2]						
Grubbing/Land Clearing	0.01	0.12	0.14	0.03	0.01	28.58
Grading/Excavation	0.25	2.43	2.36	0.21	0.11	481.03
Drainage/Utilities/ Sub-Grade	0.13	1.22	1.36	0.14	0.07	247.61
Paving	0.03	0.26	0.36	0.01	0.01	60.86
Total Project	0.42	4.03	4.23	0.40	0.20	818.08

[1] Total PM Emissions include fugitive and exhaust emissions

[2] CO_2e emissions are reported as metric tons (MT)

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 must comply with the Caltrans' Standard Specifications in Section 14-9 (2022).
    - Section 14-9.02 specifically requires compliance by the contractor with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.
- Water or a dust palliative will be applied to the site and equipment as often as necessary to control fugitive dust emissions.
- Soil binder will be spread on any unpaved roads used for construction purposes, and on all project construction parking areas.

- Trucks will be washed as they leave the right-of-way as necessary to control fugitive dust emissions.
- Construction equipment and vehicles will be properly tuned and maintained. All construction equipment will use low sulfur fuel as required by California Code of Regulations (CCR) Title 17, Section 93114.
- A dust control plan will be developed documenting sprinkling, temporary paving, speed limits, and timely re-vegetation of disturbed slopes as needed to minimize construction impacts to existing communities.
- Equipment and materials storage sites will be located as far away from residential and park uses as practicable. Construction areas will be kept clean and orderly.
- Areas near sensitive air receptors will be designated environmentally sensitive areas. Within these areas, construction activities involving the extended idling of diesel equipment or vehicles will be prohibited, to the extent feasible.
- Track-out reduction measures, such as gravel pads at project access points to minimize dust and mud deposits on roads affected by construction traffic, will be used.
- All transported loads of soils and wet materials will be covered before transport, or adequate freeboard (space from the top of the material to the top of the truck) will be provided to minimize emission of dust during transportation.
- Dust and mud that are deposited on paved, public roads due to construction activity and traffic will be promptly and regularly removed to reduce PM emissions.
- To the extent feasible, construction traffic will be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times.
- Mulch will be installed or vegetation planted as soon as practical after grading to reduce windblown PM in the area.

4.2.2 Asbestos

Asbestos minerals occur in rock and soil as the result of natural geologic processes, often in veins near earthquake faults in the coastal ranges and the foothills of the Sierra Nevada Mountains and other areas of California. Naturally occurring asbestos (NOA) takes the form of long, thin, flexible, separable fibers. Natural weathering or human disturbance can break NOA down to microscopic fibers, easily suspended in air. When inhaled, these thin fibers irritate tissues and resist the body's natural defenses.

Asbestos is a known human carcinogen. It causes cancers of the lung and the lining of internal organs, as well as asbestosis and pleural disease that inhibit lung function. The U.S. EPA is working to address concerns about potential effects of NOA in a number of areas in California.

The California Geological Survey identifies ultramafic rocks in California to be the source of NOA, and in August of 2000 they published a report titled A General Location Guide for Ultramafic Rocks in California – Areas More Likely to Contain Naturally Occurring Asbestos (available at https://filerequest.conservation.ca.gov/?q=ofr_2000-019.pdf). According to the map on the second page of this document, the project area does not contain ultramafic rocks and therefore is not an NOA area.

The proposed project does not include demolition or structural modification of bridges or other major structures/buildings, so structural asbestos is not a concern.

4.2.3 Lead

Lead is normally not an air quality issue for transportation projects unless the project involves disturbance of soils containing high levels of aerially deposited lead (ADL) or painting or modification of structures with lead-based coatings. The proposed project would not include painting or modification of any structures; therefore, lead-cased coatings would not be a potential source of lead emissions. The Initial Site Assessment conducted for the project found that soil in the project area may contain elevated levels of ADL, primarily due to historic leaded fuel emissions from automobile exhaust and typical roadway uses (Geocon, 2022).

Soil determined to contain lead concentrations exceeding stipulated thresholds would be managed in accordance with the 2016 *Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils* between Caltrans and the California Department of Toxic Substances Control and Caltrans' Standard Specifications and Standard Special Provisions for ADL. These documents require implementation of fugitive dust control measures using water or other palliatives during handling of ADL-contaminated soil, compliance with local air quality management district dust control requirements, prevention of visible dust migration beyond project limits, and security measures to keep people from coming into contact with ADL-contaminated soil.

4.3 Long-Term Effects (Operational Emissions)

Operational emissions take into account long-term changes in emissions due to the project (excluding the construction phase). The operational emissions analysis compares forecasted emissions for existing/baseline, the No-Build Alternative, and the Build Alternative.

The project-area emissions were estimated using Caltrans' CT-EMFAC2021 emissions model, which is based on ARB's EMission FACtor 2021 (EMFAC2021) model. EMFAC is a California-specific project-level analysis tool that models on-road and off-road vehicle emissions for criteria pollutants and GHGs. Combined with project-level travel activity data, CT-EMFAC can be used to estimate on-road vehicle emissions for an existing or proposed transportation project.

The emissions burden was estimated for the project study area, which includes a 2.2-mile segment of SR-29. Emissions were estimated for existing conditions (2022), opening year Build Alternative and

No-Build Alternative (2025), design year Build Alternative and No-Build Alternative (2035), and RTP horizon year Build Alternative and No-Build Alternative (2050). The AADT data and average truck percentages used to estimate emissions are presented in Table 1-1 and Table 1-3. The lower of the posted speed limits presented in Table 1-2 for SR-29 was used as representative of speeds in the study area in the absence of actual or modeled project-specific speed data.

CT-EMFAC2021 was used to generate an emissions inventory for the Napa (SF) Sub-Region for each analysis year. AADT and truck percentages are the same for the Build Alternative and No-Build Alternative in each analysis year, so only one run was needed per year to estimate emissions.

The results of the regional emissions analysis are shown in Table 4-2. The project would not increase regional VMT or emissions when compared to the No-Build Alternative. Regional VMT is expected to increase over time due to regional growth not associated with the project. Despite increases in VMT, emissions are expected to decrease over time due to improvements in fuel efficiency and vehicle technology. The estimated change in pollutant burden under the Build Alternative, when compared to the existing conditions, varies by pollutant. Emissions of ROG, NO_X, and CO would decrease in the opening year, design year, and RTP horizon year when compared to existing conditions while emissions of PM_{10} and $PM_{2.5}$ would increase. PM emission increases are a result of increased road dust, tire wear, and brake wear emissions tied to increased VMT in future years due to regional growth not associated with the project. Emission calculation details and CT-EMFAC output are provided in Appendix D.

Table 4-2. Regional Emission Burden Summary

Scenario	Daily Vehicle Miles Traveled (VMT)[1]	Emission Burdens (pounds/day)					Emission Burdens (MT/day)[2]
		ROG	NO_X	CO	PM_{10}	$PM_{2.5}$	CO_2e
2022 Existing	45,100	5.9	19.7	102.6	14.4	2.8	15.5
2025 No-Build	49,330	5.5	15.6	89.2	15.6	3.0	15.7
2025 Build	49,330	5.5	15.6	89.2	15.6	3.0	15.7
2035 No-Build	54,621	4.2	8.3	65.0	17.2	3.2	13.9
2035 Build	54,621	4.2	8.3	65.0	17.2	3.2	13.9
2050 No-Build	63,615	3.5	6.0	64.8	20.4	3.7	14.4
2050 Build	63,615	3.5	6.0	64.8	20.4	3.7	14.4
2025 % Change from Existing	9%	-7%	-21%	-13%	9%	7%	1%
2025 % Change from No-Build	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2035 % Change from Existing	21%	-29%	-58%	-37%	19%	15%	-10%
2035 % Change from No-Build	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2050 % Change from Existing	41%	-40%	-70%	-37%	41%	33%	-7%
2050 % Change from No-Build	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

[1] Estimated based on AADT and study area, which includes a 2.2-mile segment of SR-29
[2] MT = metric tons

4.3.1 CO Analysis

The Transportation Project-Level Carbon Monoxide Protocol (UCD-ITS-RR-97-21) (CO Protocol) was developed for project-level conformity (hot-spot) analysis and was approved for use by the U.S. EPA in 1997 (Garza et al., 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 CO 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 should 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.

The transportation conformity requirements for CO ceased to apply on June 1, 2018 (see Appendix E). In order to determine the project-level CO impacts of the proposed project, the flowcharts on pages 3-2 and 4-10 of the CO Protocol were used. The following series of questions and answers can be followed along with the flowcharts (highlighted in yellow in Appendix E).

Is this project exempt from all emissions analyses? NO

According to Table 1 on page 2-6 of the CO Protocol, this project is not exempt from all emissions analyses.

Is project exempt from regional emissions analyses? YES

According to Table 2 on page 2-7 of the CO Protocol, intersection channelization and intersection signalization projects are exempt from regional emissions analyses.

Examine local impacts.

Local CO impacts are examined in the section below.

Is the project in a CO non-attainment area? NO

The project is in a federal and state CO attainment area.

Was the area re-designated as "attainment" after the 1990 Clean Air Act? NO

Areas other than urbanized areas within Napa County were designated unclassifiable/attainment prior to enactment of the CAAA of 1990 (40 CFR 81).

Does project worsen air quality? NO

- Project would not significantly increase cold start percentage.
- Project would not significantly increase traffic volumes.
- Project would not worsen traffic flow.

Project satisfactory, no further analysis needed.

The proposed project would not be likely to worsen air quality based on the criteria listed in Section 4.7.1 of the CO Protocol. The project does not include any parking facilities where vehicles would be cold-started. Therefore, the proposed project would not affect cold start percentages in the area. The proposed project would not increase traffic volumes and is expected to improve traffic flow. As a result, the proposed project does not require further project-level CO hot-spot analysis.

4.3.2 PM Analysis

Emissions Analysis

PM emissions were estimated for Baseline (2022), and for the No-Build Alternative and the Build Alternative for the opening year of 2025, project design year of 2035, and the RTP horizon year of 2050. As shown in Table 4-2, the estimated $PM_{2.5}$ and PM_{10} pollutant burdens under the Build Alternative would not change when compared to the No-Build Alternative. However, PM_{10} emissions in the study area would increase approximately 9 percent in the opening year, 19 percent in the

design year, and 41 percent in the RTP horizon year with the Build Alternative when compared to existing conditions. $PM_{2.5}$ emissions in the study area would increase approximately 7 percent in the opening year, 15 percent in the design year, and 33 percent in the RTP horizon year with the Build Alternative when compared to existing conditions. PM emission increases are a result of increased road dust, tire wear, and brake wear emissions tied to increased VMT in future years due to regional growth not associated with the project.

Hot-Spot Analysis

In October 2021, 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 EMFAC2011 and U.S. EPA's 2012 PM NAAQS final rule. The next revision, released in November 2015, was updated to reflect MOVES2014 and to revise design value calculations to be more consistent with other U.S. EPA programs. The newest October 2021 version has been updated to reflect MOVES3, including new guidance on the number of MOVES runs; to reflect that AERMOD is the required model for PM hot-spot analyses; and to reflect guidance implementation and experience in the field (U.S. EPA, 2021). 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 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 proposed project is not considered a POAQC for $PM_{2.5}$ because it does not meet the definition of a POAQC as defined in U.S. EPA's Transportation Conformity Guidance.

The proposed project is not a new or expanded highway project with a significant number of or significant increase in diesel vehicles (U.S. EPA's Transportation Conformity Guidance defines significant as greater than 125,000 AADT and 8% or more of such AADT is diesel truck traffic, or in practice 10,000 truck AADT or more regardless of total AADT; significant increase is defined in

practice as a 10% increase in heavy duty truck traffic). The proposed project is an intersection safety and operations project that would not increase the capacity of SR-29 or increase diesel traffic. This type of project improves highway operations by reducing traffic congestion at existing intersections and improving merge operations. As such, the traffic details for the No-Build Alternative are also representative of traffic conditions for the project Build Alternative. The project is not a capacity enhancing or VMT-inducting project; therefore, no VMT analysis was performed for the project pursuant to Caltrans guidance. AADT and truck traffic details for the study area are presented in Tables 1-1 and 1-3.

The proposed project would not affect intersections that are at LOS D, E, or F with a significant number of diesel vehicles. As shown in Tables 1-1 and 1-3, the proposed project would not affect intersections with a significant number of diesel vehicles or increase the number of diesel vehicles at affected intersections. The purpose of the project is to enhance safety and traffic operations at the affected intersections, which is anticipated to decrease congestion in the study area and may improve travel time, reduce delay, and increase free-flow speeds.

The project does not involve new or expanded bus and rail terminals and transfer points that have a significant number of or increase in diesel vehicles congregating at a single location.

Furthermore, the proposed project is not in or affecting locations, areas, or categories of sites that are identified in the $PM_{2.5}$ applicable implementation plan or implementation plan submission, as appropriate, as sites of violation or possible violation.

As such, PM hot-spot analysis is not required. The project was presented to the air quality conformity task force on February 23, 2023, and IAC participants concurred that the project is not a POAQC. Documentation confirming completion of the IAC process is included in Appendix B.

4.3.3 NO_2 Analysis

The U.S. EPA modified the NO_2 NAAQS to include a 1-hr standard of 100 parts per billion (ppb) in 2010. Currently there is no federal project-level NO_2 analysis requirement. However, NO_2 is among the near-road pollutants of concern.

For project-level analysis, an NO_2 assessment protocol is not available. As shown in Table 4-2, the estimated NO_X pollutant burden under the Build Alternative would not change when compared to the No-Build Alternative. However, NO_X emissions in the study area would decrease approximately 21 percent in the opening year, 58 percent in the design year, and 70 percent in the RTP horizon year with the Build Alternative when compared to existing conditions due to improvements in vehicle technology and fuel economy regulations. NO_X emissions are a combination of NO and NO_2 and can serve as a useful analysis surrogate for NO_2.

4.3.4 Mobile Source Air Toxics Analysis

FHWA released updated guidance in January 2023 (FHWA, 2023) 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 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).

Based on the FHWA's recommended tiering approach, this project falls within the Tier 1 approach (i.e., for projects with no potential for meaningful MSAT effects). The proposed project Build Alternative would not add capacity, increase traffic volumes, or change the vehicle mix in the study area. As a result, the proposed project would have no potential for meaningful MSAT effects and quantitative analysis is not required. Additionally, emissions are expected to be lower than present levels in the project opening year, design year, and RTP horizon year as a result of U.S. EPA's national control programs that are projected to reduce annual MSAT emissions by over 80 percent between 2010 and 2050. 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 that MSAT emissions in the study area are expected to be lower in the future in nearly all cases.

For informational purposes, CT-EMFAC2021 was used to estimate quantitative MSAT emissions for the project study area, which includes a 2.2-mile segment of SR-29. Emissions were estimated for existing conditions (2022), opening year Build Alternative and No-Build Alternative (2025), design year Build Alternative and No-Build Alternative (2035), and RTP horizon year Build Alternative and No-Build Alternative (2050). The AADT data and average truck percentages used to estimate

emissions are presented in Table 1-1 and Table 1-3. The lower of the posted speed limits presented in Table 1-2 for SR-29 was used as representative of speeds in the study area in the absence of actual or modeled project-specific speed data.

CT-EMFAC2021 was used to generate an emissions inventory for the Napa (SF) Sub-Region for each analysis year. AADT and truck percentages are the same for the Build Alternative and No-Build Alternative in each analysis year, so only one run was needed per year to estimate emissions.

The results of the MSAT emissions analysis are shown in Table 4-3. The project would not increase regional VMT or emissions when compared to the No-Build Alternative. Despite increases in regional VMT over time due to regional growth not associated with the project, MSAT emissions would decrease over time as expected based on U.S. EPA's national projects and control programs. Emission calculation details and CT-EMFAC output are provided in Appendix D.

Table 4-3. MSAT Emission Summary

Scenario	MSAT Emissions (pounds/day)								
	1,3-Butadiene	Acetaldehyde	Acrolein	Benzene	Diesel PM	Ethylbenzene	Formaldehyde	Naphthalene	POM
2022 Existing	0.01	0.05	0.00	0.16	0.12	0.07	0.12	0.01	0.00
2025 No-Build	0.01	0.05	0.00	0.14	0.11	0.06	0.10	0.01	0.00
2025 Build	0.01	0.05	0.00	0.14	0.11	0.06	0.10	0.01	0.00
2035 No-Build	0.00	0.02	0.00	0.09	0.06	0.04	0.06	0.00	0.00
2035 Build	0.00	0.02	0.00	0.09	0.06	0.04	0.06	0.00	0.00
2050 No-Build	0.00	0.01	0.00	0.07	0.04	0.04	0.03	0.00	0.00
2050 Build	0.00	0.01	0.00	0.07	0.04	0.04	0.03	0.00	0.00

4.3.5 Greenhouse Gas Emissions Analysis

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 project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

The Global Warming Solutions Act of 2006 (AB32) requires that the ARB determine the statewide GHG emissions level in 1990. The act also requires that the Board approve a statewide GHG emissions limit, equal to the 1990 level, as a limit to be achieved by 2020. The 2020 GHG emissions limit is 431 million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Senate Bill 32, California Global Warming Solutions Act of 2006: Emissions Limit (SB32), was signed in 2016 and further requires California to reduce statewide GHG emissions to 40% below the 1990 level by 2030. Assembly Bill 1279, the California Climate Crisis Act (AB1279), was signed in 2022 and requires California to reduce statewide GHG emissions by 85% compared to 1990 levels. AB1279 also requires California to achieve net zero GHG emissions by 2045 and achieve and maintain net negative GHG emissions thereafter. ARB's developed a Scoping Plan outlining the path to achieve California's climate targets, which must be updated every five years.

ARB's *California Greenhouse Gas Emissions for 2000 to 2020: Trends of Emissions and Other Indicators* summarizes information presented in the 2022 California GHG Emission Inventory, which covers GHG emissions released during calendar years 2000 through 2020 (ARB, 2022). As shown in Figure 4-1, emissions dropped below the 2020 GHG emissions limit in 2014 and have remained below the limit since that time.

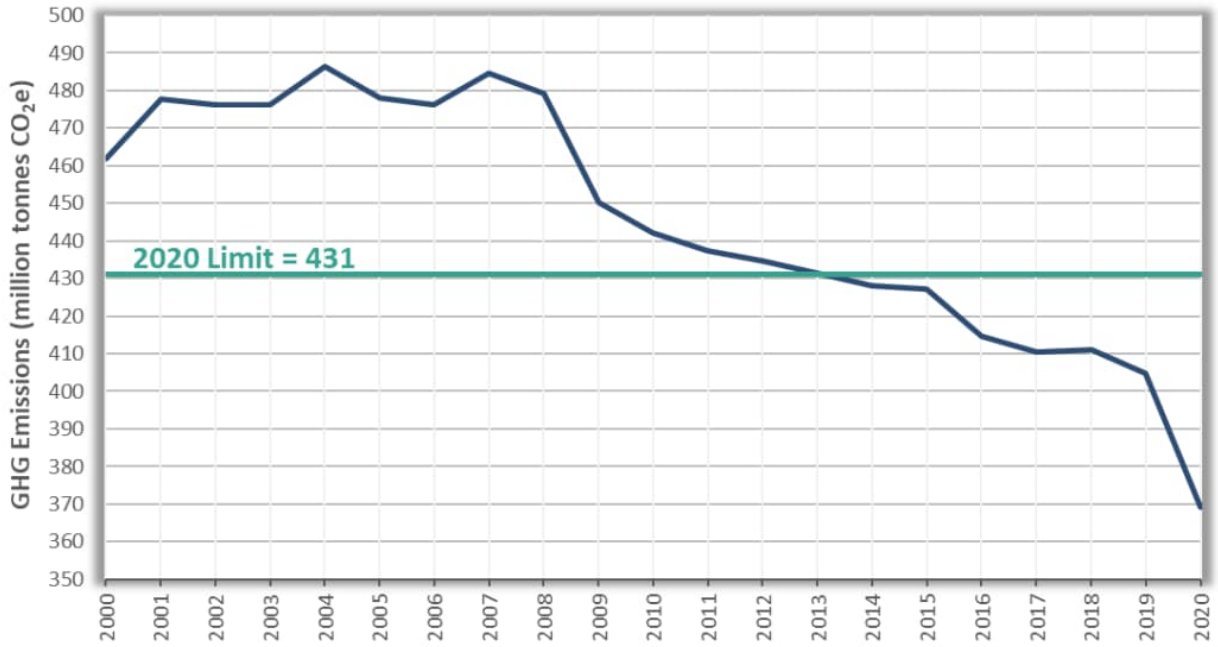

Figure 4-1. Comparison of Annual Statewide GHG Emissions to the 2020 GHG Limit.
(Source: https://ww2.arb.ca.gov/sites/default/files/classic/cc/inventory/2000-2020_ghg_inventory_trends.pdf)

As shown in Table 4-2, the estimated CO_2e pollutant burden under the Build Alternative would not change when compared to the No-Build Alternative since the project would not add capacity, increase vehicle traffic, or change the vehicle mix in the study area. However, VMT would increase in the study area in future years when compared with existing conditions, resulting in a 1 percent increase in CO_2e emissions with the Build Alternative in the opening year of 2025. CO_2e emissions would decrease by approximately 10 percent in the design year of 2035 and 7 percent in the RTP

horizon year of 2050 despite an increase in VMT due to improvements in vehicle technology and increased use of alternative fuels. As such, the project is not expected to affect regional GHG emission levels. Construction of the project would produce temporary GHG emissions from the operation of equipment, as shown in Table 4-1.

4.4 Cumulative/Regional/Indirect Effects

Ozone, 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. MTC's RTP for the San Francisco Bay Area, known as Plan Bay Area 2050, includes a list of all regionally significant transportation projects planned in the region to be implemented by 2050. The emissions analysis performed as part of the conformity determination evaluates the cumulative impact of all listed transportation projects.

The 2021 Final Environmental Impact Report (FEIR) evaluated environmental impacts and identified that implementation of Plan Bay Area 2050 would result in significant and unavoidable impacts to air quality in the nine-county Bay Area region even after mitigation. As an intersection channelization project, the proposed project is exempt from regional conformity analysis per 40 CFR 93.127 and would not contribute to the significant and unavoidable impacts described in the FEIR.

Global climate change is inherently a cumulative issue and the proposed project's contribution to climate change is only addressed cumulatively. As described in Section 4.3.5, the proposed project is not expected to affect regional GHG emission levels or result in cumulatively considerable effects.

5. Minimization Measures

5.1 Short-Term (Construction)

Most of the construction impacts to air quality are short-term in duration and, therefore, will not result in long-term adverse conditions. No adverse construction impacts are expected with the project, and no mitigation measures are recommended. The Caltrans standard specifications described in Section 4.2.1 will be implemented during construction activities.

5.2 Long-Term (Operational)

Intersection channelization and intersection signalization projects are exempt from regional conformity requirements (40 CFR 93.127). Separate listing of the project in the RTP and TIP, and their regional conformity analyses, is not necessary. The project would not interfere with timely implementation of Transportation Control Measures identified in the applicable SIP and regional conformity analysis.

This project would not affect cold start percentages in the area, would not affect traffic volumes, and is expected to improve traffic flow when comparing Build conditions to No-Build conditions in the project opening year of 2025, project design year of 2035, and RTP horizon year of 2050. As such, no microscale CO impacts are anticipated. The project was presented to the air quality conformity task force on February 23, 2023, and IAC participants concurred that the project is not a POAQC. The project would not affect regional VMT and is therefore not anticipated to have any MSAT or GHG impacts.

As such, no operational impacts are expected with the project, and no mitigation measures are recommended.

6. Conclusions

Short-term impacts may occur during construction from the release of particulate emissions as well as construction equipment exhaust. Construction emissions were estimated, and no adverse construction impacts are expected with the project.

Regional long-term impacts from operational emissions were estimated for the baseline (2022) and the No-Build Alternative and Build Alternative in the project opening year (2025), project design year (2035), and RTP horizon year (2050). The estimated NAAQS emissions burdens under the Build Alternative would not change when compared to the No-Build Alternative since the proposed project would not increase capacity, increase vehicle traffic, or change the vehicle mix in the study area. However, VMT in the study area is expected to increase over time due to regional growth independent of the proposed project, resulting in changes to regional emissions for the Build Alternative when compared to existing conditions.

The estimated change in pollutant burden under the Build Alternative, when compared to the existing conditions, varies by pollutant. Despite increases in VMT, operational emissions of ROG and NO_X for the Build Alternative would decrease over time when compared to the existing conditions due to improvements in fuel efficiency and vehicle technology. Build Alternative CO emissions would decrease over time when compared to the existing conditions through 2035, then remain constant at a level below existing conditions through 2050. Emissions of PM_{10} and $PM_{2.5}$ would increase in the opening year, design year, and RTP horizon year compared to existing conditions as a result of increased road dust, tire wear, and brake wear emissions tied to increased VMT. The regional GHG emissions burdens under the Build Alternative are predicted to increase slightly in the opening year of 2025 when compared to existing conditions, then decrease below existing levels in the design year of 2035. GHG emissions would increase again in the RTP horizon year of 2050, but still remain below existing levels. The project is considered to have no potential for meaningful MSAT effects.

Localized PM analysis is required for this project to satisfy conformity requirements. The air quality conformity task force concluded that the project is not a POAQC during IAC, and the project is not expected to cause any adverse PM impacts.

7. References

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8. Appendices

Appendix A - RTP and TIP Listings for the Project

Appendix B - Interagency Consultation Documentation

Appendix C - RCEM Input and Output

Appendix D – CT-EMFAC2021 Input and Output

Appendix E - EPA CO Letter and CO Flow Chart (Based on the CO Protocol)

8. Appendices

Appendix A - RTP and TIP Listings for the Project

Napa County

Local Road Projects

TIP ID: **NAP110029** **County:** Napa **System:** LOCAL_ROA **RTP ID:** 21-T08-060 **CTIPS** 20600005557

Sponsor: American Canyon **Implementing Agency:** American Canyon

Project Name: Eucalyptus Drive Realignment Complete Streets

Description: American Canyon : Eucalyptus Dr. from Theresa Rd to Hwy 29 : Extend roadway and reconfigure intersection of Eucalyptus Dr and Hwy 29 and Eucalyptus Drive and Theresa Road. Create complete street areas for pedestrians and bicyclist along the extension.

Air Quality Exempt Code: 40 CFR 93.101 - Non-Exempt - Not Regionally Significant Project

Route: **Post Mile From:** **Post Mile To:** **Toll Credits:**

All funding in thousands of dollars

Phase	Fund Source	Prior Years	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Future Years	Total Programmed
PSE	OTHER LOCAL	$ 1,240						$ 1,240
PE	OTHER LOCAL	$ 528						$ 528
ROW	OTHER LOCAL	$ 776						$ 776
CON	OTHER LOCAL	$ 826						$ 826
CON	RTP-LRP						$ 2,819	$ 2,819
Total Programmed Funding:		$ 3,370					$ 2,819	$ 6,189

TIP ID: **NAP130006** **County:** Napa **System:** LOCAL_ROA **RTP ID:** 21-T08-060 **CTIPS** 20600005809

Sponsor: American Canyon **Implementing Agency:** American Canyon

Project Name: Devlin Road and Vine Trail Extension

Description: American Canyon : Devlin Road from the southern terminus 2,500 feet south to Green Island Road : Construct roadway extension and Class I multipurpose path

Air Quality Exempt Code: 40 CFR 93.101 - Non-Exempt - Not Regionally Significant Project

Route: **Post Mile From:** **Post Mile To:** **Toll Credits:**

All funding in thousands of dollars

Phase	Fund Source	Prior Years	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Future Years	Total Programmed
ENV	RIP	$ 297						$ 297
ROW_SU	OTHER LOCAL	$ 800						$ 800
CON	OTHER LOCAL	$ 120						$ 120
CON	PRIVATE	$ 2,200						$ 2,200
CON	RIP	$ 4,151						$ 4,151
Total Programmed Funding:		$ 7,568						$ 7,568

TIP ID: **NAP190007** **County:** Napa **System:** LOCAL_ROA **RTP ID:** 21-T07-056 **CTIPS** 20600006705

Sponsor: Metropolitan Transportation Commission (MTC) **Implementing Agency:** Metropolitan Transportation

Project Name: Napa Valley Forward: Safety and Operational Impv

Description: Napa (City) : SR-29 Up Valley Corridor : Provide safety and operational improvements for multimodal corridor.

Air Quality Exempt Code: 40 CFR 93.127 - Intersection channelization projects

Route: 37 **Post Mile From:** **Post Mile To:** **Toll Credits:** $ 917,600

All funding in thousands of dollars

Phase	Fund Source	Prior Years	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Future Years	Total Programmed
PE	STP	$ 3,700						$ 3,700
CON	RTP-LRP						$ 6,900	$ 6,900
CON	STP		$ 4,300					$ 4,300
Total Programmed Funding:		$ 3,700	$ 4,300				$ 6,900	$ 14,900

TIP ID: **NAP110026** **County:** Napa **System:** LOCAL_ROA **RTP ID:** 21-T01-004 **CTIPS** 20600005558

Sponsor: Napa County **Implementing Agency:** Napa County

Project Name: Hardin Rd Bridge Replacement - 21C0058

Description: Napa County : On Harding Rd at Maxwell Creek, 1.6M SE of Pope Cyn Rd : Replace existing one lane bridge with new 2-lane bridge to meet standards. Toll credits are used in lieu of match for all phases.

Air Quality Exempt Code: 40 CFR 93.126 - Safety - Projects that correct, improve, or eliminate a hazardous location or feature

Route: **Post Mile From:** **Post Mile To:** **Toll Credits:** $ 507,720

All funding in thousands of dollars

Phase	Fund Source	Prior Years	FY 2022/23	FY 2023/24	FY 2024/25	FY 2025/26	Future Years	Total Programmed
PE	HBP			$ 797				$ 797
PE	OTHER LOCAL			$ 103				$ 103
ROW	HBP					$ 177		$ 177
ROW	OTHER LOCAL					$ 23		$ 23
CON	HBP						$ 4,426	$ 4,426
CON	OTHER LOCAL						$ 574	$ 574
Total Programmed Funding:				$ 900		$ 200	$ 5,000	$ 6,100

List of 2021 TIP Projects

County	Sponsor	Project Title	Project Description	TIP ID	Air Quality Description	RTP ID	Conformity Analysis Year
Marin	San Rafael	Francisco Boulevard East Sidewalk Widening	In San Rafael: Francisco Blvd East and Grand Ave from Vivian St to Grand Avenue Bridge: Widen existing sidewalk and provide streetscape elements	MRN170012	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Marin	San Rafael	Grand Avenue Bicycle Pedestrian Improvements	San Rafael: Grand Ave accross the San Rafael Canal: Construct bridge and sidewalk improvements for bicyclists and pedestrians	MRN150008	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Marin	San Rafael	San Rafael Transit Center Pedestrian Access Imps.	San Rafael: In the vicinity of the Bettini Transit Center and the future SMART station: Upgrade existing traffic signal equipment to be compliant with rail and improve pedestrian facilities	MRN130005	EXEMPT (40 CFR 93.127) - Intersection signalization projects at individual intersections	21-T07-056	Not Modelled
Marin	Sausalito	Sausalito - Bridgeway/US 101 Off Ramp Bicycle Imps	Sausalito: Highway 101 Off Ramp/Bridgeway/Gate 6 Intersection: Implement bicycle improvements	MRN110010	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Marin	TAM	North-South Greenway Gap Closure	Marin County: Northern Segment: US101 off-ramp over Corte Madera Creek and along Old Redwood Highway to US101 overcrossing: widen to add bike/ped path. Southern Segment: From Northern	MRN170011	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Marin	Various	GL: Marin County - TOS-Mobility	Marin County: Various Locations: Projects are consistent with 40 CFR Part 93.126 Exempt Tables 2 and 40 CFR Part 93.127 Table 3 categories	MRN170018	EXEMPT (40 CFR 93.126) - Projects that correct, improve, or eliminate a hazardous location or feature	21-T06-048	Not Modelled
Napa	American Canyon	Devlin Road and Vine Trail Extension	American Canyon: Devlin Road from the southern terminus 2,500 feet south to Green Island Road: Construct roadway extension and Class I multipurpose path	NAP130006	NON-EXEMPT - Not Regionally Significant Project	21-T07-056	Not Modelled
Napa	American Canyon	Eucalyptus Drive Realignment Complete Streets	American Canyon: Eucalyptus Dr. from Theresa Rd to Hwy 29: Extend roadway and reconfigure intersection of Eucalyptus Dr and Hwy 29 and Eucalyptus Drive and Theresa Road. Create complete street	NAP110029	NON-EXEMPT - Not Regionally Significant Project	21-T07-056	Not Modelled
Napa	American Canyon	Green Island Road Class I	American Canyon: Green Island Road in the Green Island Industrial District (GRID): Construct new Class 1 multi-use trail.	NAP170006	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Napa	Calistoga	SR 128 and Petrified Forest Intersection Imp	In Calistoga: On SR 128 and Petrified Forest Road, convert 4-way stop controlled intersection to a traffic signal.	NAP150001	EXEMPT (40 CFR 93.127) - Intersection signalization projects at individual intersections	21-T07-056	Not Modelled
Napa	MTC	Napa Valley Forward	Napa County: SR 29 and Silverado Trail Corridor: Assist Napa Valley employees to try alternative options for their commutes to work.	NAP190004	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-EN09-132	Not Modelled
Napa	MTC	Napa Valley Forward: Safety & Operational Impv	Napa: SR-29 Up Valley Corridor: Provide safety and operational improvements for multimodal corridor.	NAP190007	EXEMPT (40 CFR 93.127) - Intersection channelization projects	21-T07-056	Not Modelled
Napa	MTC	Regional Planning Activities and PPM - Napa	Napa: Countywide: Regional Planning Activities and Planning, Programming and Monitoring (PPM)	NAP170001	EXEMPT (40 CFR 93.126) - Planning activities conducted pursuant to titles 23 and 49 U.S.C	21-T07-058	Not Modelled
Napa	Napa	California Boulevard Roundabouts	City of Napa: At First Street/ California Blvd. and Second Street/ California Blvd: Construct roundabouts Caltrans: Construct roundabout at Northbound off-ramp of SR 29 and First Street	NAP110028	EXEMPT (40 CFR 93.127) - Intersection channelization projects	21-T07-056	Not Modelled
Napa	Napa	Silverado Trail Five-Way Intersection Improvements	City of Napa: At the intersection of Silverado Trail, Third St, Coombsville Rd, and East Ave: Construct roundabout. Project will be constructed in phases.	NAP170009	EXEMPT (40 CFR 93.127) - Intersection channelization projects	21-T07-056	Not Modelled
Napa	Napa	State Route 29 Bicycle & Pedestrian Undercrossing	Napa: On the North side of Napa Creek under Highway 29: Construct a Class 1 bicycle and pedestrian path	NAP130004	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Napa	Napa	Vine Trail Gap Closure - Soscol Avenue Corridor	Napa: Between Third St and Vallejo St in Downtown Napa: Construct a Class I multi-use trail to close a gap in the Napa Valley Vine Trail	NAP170007	EXEMPT (40 CFR 93.126) - Bicycle and pedestrian facilities	21-T08-060	Not Modelled
Napa	Napa County	Hardin Rd Bridge Replacement - 21C0058	Napa County: On Harding Rd at Maxwell Creek, 1.6M SE of Pope Cyn Rd: Replace existing one lane bridge with new 2-lane bridge to meet standards. Toll credits are used in lieu of match for all phases.	NAP110026	EXEMPT (40 CFR 93.126) - Projects that correct, improve, or eliminate a hazardous location or feature	21-T01-004	Not Modelled
Napa	Napa County	Loma Vista Dr Bridge Replacement - 21C0080	Napa County: Loma Vista Dr over Soda Creek, 1.4 miles north of Silverado Trail: replace existing one lane bridge with new two lane bridge to meet standards. Toll credits are used in lieu of match for all	NAP110027	EXEMPT (40 CFR 93.126) - Projects that correct, improve, or eliminate a hazardous location or feature	21-T01-004	Not Modelled

Appendix B - Interagency Consultation Documentation

Schwing, Elizabeth

From:	Fund Management System <fms@bayareametro.gov>
Sent:	Wednesday, March 22, 2023 9:23 AM
To:	dschmitz@nvta.ca.gov
Cc:	Fund Management System; Harold Brazil
Subject:	FMS POAQC Project TIP ID: NAP190007 (Napa Valley Forward: Safety and Operational Impv) update: Project is a not a POAQC

Dear Project Sponsor

Based on the recent interagency consultation with the Air Quality Conformity Task force, Project TIP ID NAP190007 (FMS ID: 7162) does not fit the definition of a project of air quality concern as defined by 40 CFR 93.123(b)(1) or 40 CFR 93.128 and therefore is not subject to PM2.5 project level conformity requirement. Please save this email as documentation confirming the project has undergone and completed the interagency consultation requirement for PM2.5 project level conformity. Note project sponsors are required to undergo a proactive public involvement process which provides opportunity for public review as outlined by 40 CFR 93.105(e). For projects that are not of air quality concern, a comment period is only required for project level conformity determinations if such a comment period would have been required under NEPA. For more information, please see FHWA PM2.5 Project Level Conformity Frequently Asked Questions (FAQ): http://www.fhwa.dot.gov/environment/air_quality/conformity/policy_and_guidance/faqs/pm25faqs.cfm

If you have any questions, please direct them to Harold Brazil at hbrazil@bayareametro.gov or by phone at 415-778-6747

Air Quality Conformity Task Force
Summary Meeting Notes
February 23, 2023

Participants:
Rodney Tavitas – Caltrans
Abhijit Bagde – Caltrans
Michael Dorantes – EPA
Emma Maggioncalda – Caltrans
Cidney Chiu – Caltrans
John Saelee – MTC
Patrick Pittenger – FHWA
Jacqueline Kahrs – Caltrans
James Zandian – GHD
Erika Vaca – Caltrans
Stephanie Whitmore – WSP
Andrea Gordon – BAAQMD
Elizabeth Schwing – WSP
Adam Crenshaw – MTC
Harold Brazil – MTC
Karishma Becha – Caltrans
Erika Espinosa Araiza – Caltrans

1. **Welcome and Self Introductions**: Harold Brazil (MTC) called the meeting to order at 9:35 am.

2. **$PM_{2.5}$ Project Conformity Interagency Consultation**

   a. **Consultation to Determine Project of Air Quality Concern Status**

      i. State Route 29 (SR-29) Improvements at Rutherford and Oakville Intersections Project

Elizabeth Schwing (WSP) began the presentation for the State Route 29 Improvements at Rutherford and Oakville Intersections project by identifying the project location which is a 2.2-mile segment of SR-29 in an unincorporated area of Napa County. Ms Schwing added that the project proposes the improvement of two intersections at:

- SR-29/Rutherford Road (SR-128) in the community of Rutherford (PM 24.59)
  - Improvements include – Traffic signal and/or other traffic calming measures
- SR-29/Oakville Cross Road in the community of Oakville (PM 22.72)
  - Improvements include – Single-lane roundabout

Ms. Schwing discussed the purpose of the project is to enhance safety and traffic operations at the intersections of SR-29 and Oakville Cross Road and SR-29 and Rutherford Road as to:

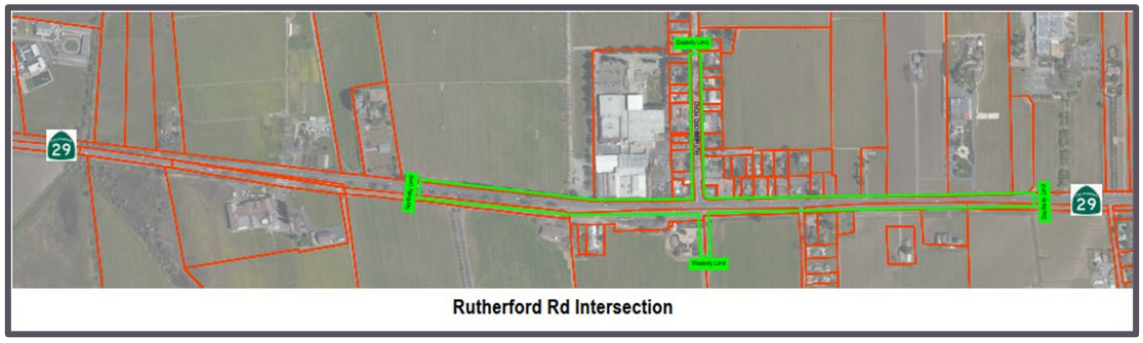
- Improve travel time and reduce delay for side streets accessing SR-29.
- Enhance traffic safety.
- Improve turning movements.

Ms. Schwing added that the needs of the State Route 29 Improvements at Rutherford and Oakville Intersections project include intersections under study have been experiencing poor traffic operation and a high number of collisions due to the lack of protected turning movements and:

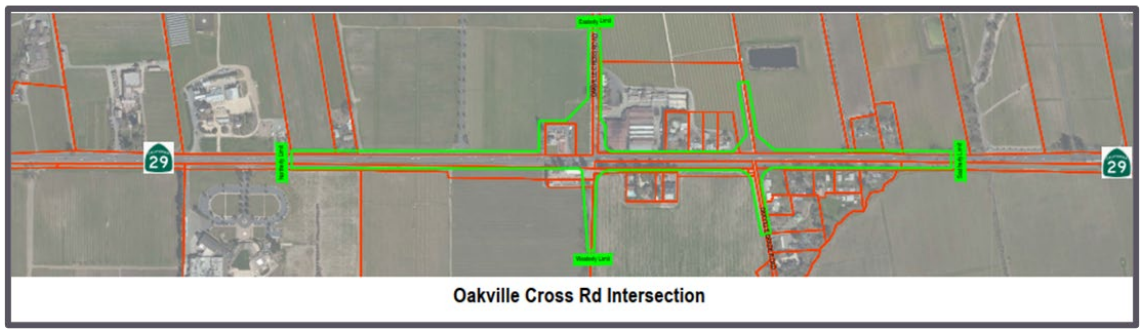
- The number of collisions exceed statewide average for similar type of facility.

- Poor intersection operation occurs during peak and non-peak periods caused by high traffic volume.
- Lack of protected turning movements to allow for access to and from SR-29 due to insufficient gaps in traffic streaming.

Project Area Limits at Each Intersection



Rutherford Rd Intersection



Oakville Cross Rd Intersection

Michael Dorantes (EPA) asked, for study area traffic data, to confirm that there is no/zero difference between the build and no build projected ADTs and Ms. Schwing concurred that the values were the same.

Harold Brazil (MTC) asked about weekend traffic data collected for the State Route 29 Improvements at Rutherford and Oakville Intersections project and Ms. Schiwing indicated that the traffic data was available and could follow-up with the information.

> ***Final Determination:*** With input from EPA, FTA, Caltrans and FHWA (deferring their determination to Caltrans), the Task Force concluded the State Route 29 Improvements at Rutherford and Oakville Intersections project was not of air quality concern.

3. Projects with Regional Air Quality Conformity Concerns

a. Regional Conformity Status for New and Revised Projects

Adam Crenshaw (MTC) stated MTC is proposing to add one bike and ped project to the TIP through a future amendment. Mr. Crenshaw asked if any Task Force members had any questions or comments and the members had none.

4. Consent Calendar

a. February 23, 2023 Air Quality Conformity Task Force Meeting Summary

Final Determination; With input from all members, the Task Force concluded that the consent calendar was approved.

5. Other Items

Patrick Pittenger (FHWA) noted the promotion of planner Jasmine Aman and will be responsible for MTC Task Force meetings after a transition period.

Adam Crenshaw (MTC) provided an informational item from the OA management meeting he recently attended where there was discussion about the carbon reduction program and the programming process for that. Mr. Crenshaw added that right now, the projects need to be reviewed by Caltrans before they are included in the TIP.

Patrick Pittenger (FHWA) mentioned that any funds allocated to any urbanized area within the boundaries of a TMA or an MPO may be used anywhere within the boundaries of that MPO and there will be a regional competitive decision-making process similar to how the STP and CMAQ funding programs are conducted. Mr. Pittenger went on to say the funding eligibility for the carbon reduction program is a work in progress and the Task Force should stay tuned for updates.

Application of Criteria for a Project of Air Quality Concern
Project Title: State Route 29 (SR-29) Improvements at Rutherford and Oakville Intersections
Project Summary for Air Quality Conformity Task Force Meeting: February 23, 2023

Description

- Proposed project would improve the operation and safety at two currently unsignalized intersections
- A single-lane roundabout is proposed at the intersection of SR-29 and Oakville Cross Road.
- Installation of a traffic signal and/or other traffic calming measures is proposed at the intersection of SR-29 and Rutherford Road.
- The proposed project would not add capacity, increase traffic volumes, or change the vehicle mix in the study area.

Background

- Documented Categorical Exclusion is being prepared for the proposed project pursuant to 23 USC 326.
- Circulation for public comment is not required because the NEPA determination for this project is a Categorical Exclusion.
- Proposed project is an intersection channelization project, and as such, is exempt from regional conformity analysis pursuant to 40 CFR 93.127.

Not a Project of Air Quality Concern (40 CFR 93.123(b)(1))

(i) New or expanded highway projects with significant number/increase in diesel vehicles?

- Not a new or expanded highway project
- intersection safety and operations project - would not increase the capacity of SR-29
- No change in traffic volume or truck percentages on SR-29

(ii) Affects intersections at LOS D, E, or F with a significant number of diesel vehicles?

- Diesel vehicles represent 2 - 8% of traffic volume in the study area (AADT of 359 – 1,816 in opening year of 2025; AADT of 397 – 2,011 in design year of 2035; AADT of 463 – 2,342 in RTP Horizon Year of 2050)
- No change in traffic volume or truck percentages at intersections
- Proposed project would improve congestion at affected intersections

(iii) New bus and rail terminals and transfer points?—Not Applicable

(iv) Expanded bus and rail terminals and transfer points?—Not Applicable

(v) Affects areas identified in PM_{10} or $PM_{2.5}$ implementation plan as site of violation?

- Proposed project not in an area identified as a site of violation

RTIP ID# *(required)* 21-T07-056

TIP ID# *(required)* NAP190007

Air Quality Conformity Task Force Consideration Date
February 23, 2023

Project Description *(clearly describe project)*
The Metropolitan Transportation Commission (MTC), in cooperation with Napa Valley Transportation Authority (NVTA) and the California Department of Transportation (Caltrans), proposes to improve the operation and safety of SR-29 at the intersections of Oakville Cross Road (PM 22.72) and Rutherford Road (PM 24.59). Currently, neither of these intersections are signalized and only have stop signs on streets intersecting SR-29. A single-lane roundabout is proposed at the intersection of SR-29 and Oakville Cross Road. Due to right-of-way limitations, a roundabout will not be feasible at the Rutherford Road intersection without substantial right-of-way impact. Hence, the project proposes to install a traffic signal and/or other traffic calming measures at the intersection of SR-29 and Rutherford Road.

Type of Project: Intersection channelization project

County	*Narrative Location/Route & Postmiles*
Napa	SR-29 at the intersections of Oakville Cross Road (PM 22.72) and Rutherford Road (PM 24.59) **Caltrans Projects – EA#** 2W430-SR-29

Lead Agency: MTC

Contact Person	*Phone#*	*Fax#*	*Email*
Ingrid Supit	(415) 778-6691		isupit@bayareametro.gov

Federal Action for which Project-Level PM Conformity is Needed *(check appropriate box)*

	Categorical Exclusion (NEPA)	**EA or Draft EIS**	**FONSI or Final EIS**	**PS&E or Construction**	*Other*
X					

Scheduled Date of Federal Action:

NEPA Delegation – Project Type *(check appropriate box)*

	X	**Section 326 – Categorical Exclusion**

Section 327 – Non-Categorical Exclusion

Current Programming Dates *(as appropriate)*

	PE/Environmental	**ENG**	**ROW**	**CON**
Start	8/19/2021	8/19/2021	9/5/2022	7/9/2024
End	9/14/2023	4/4/2024	4/4/2024	1/19/2026

Project Purpose and Need (Summary): *(please be brief)*
The purpose of the project is to enhance safety and traffic operations at the intersections of SR-29 and Oakville Cross Road and SR-29 and Rutherford Road. The proposed project is needed because the intersections under study have been experiencing poor traffic operation and a higher number of collisions due to lack of protected turning movements.

Surrounding Land Use/Traffic Generators *(especially effect on diesel traffic)*

Land use in the project area is primarily agricultural (vineyards); tourism draws additional traffic to the area.

Brief summary of assumptions and methodology used for conducting analysis
The project is not a capacity enhancing or VMT-inducting project; therefore, no VMT analysis was performed for the project pursuant to Caltrans guidance. The proposed project is an intersection safety and operations project that would not increase the capacity of SR-29, increase traffic volumes, or change the vehicle mix in the study area. As such, the traffic details for the No-Build Alternative are also representative of traffic conditions for the project Build Alternative.

Opening Year: If facility is a highway or street, Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility

N/A

RTP Horizon Year / Design Year: If facility is a highway or street, Build and No Build LOS, AADT, % and # trucks, truck AADT of proposed facility
N/A

Opening Year: If facility is an interchange(s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT

AADT and truck traffic details for the study area, which includes a 2.2-mile segment of SR-29, are presented below. Intersection-level traffic modeling was not performed for the proposed project.

Location	2025 AADT		% Truck
	Total	Truck	
SR-29 between Oakville Cross Road and Rutherford Road	22,423	359 – 1,816	1.6% - 8.1%

Percentage of vehicles that are trucks presented as a range to capture traffic data collected during weekday AM, weekday PM, and weekend mid-day peak periods.

RTP Horizon Year / Design Year: If facility is an interchange (s) or intersection(s), Build and No Build cross-street AADT, % and # trucks, truck AADT

Extrapolated AADT and truck traffic details for the study area, which includes a 2.2-mile segment of SR-29, are presented below. Intersection-level traffic modeling was not performed for the proposed project.

Location	2050 AADT		% Truck
	Total	Truck	
SR-29 between Oakville Cross Road and Rutherford Road	28,916	463 – 2,342	1.6% - 8.1%

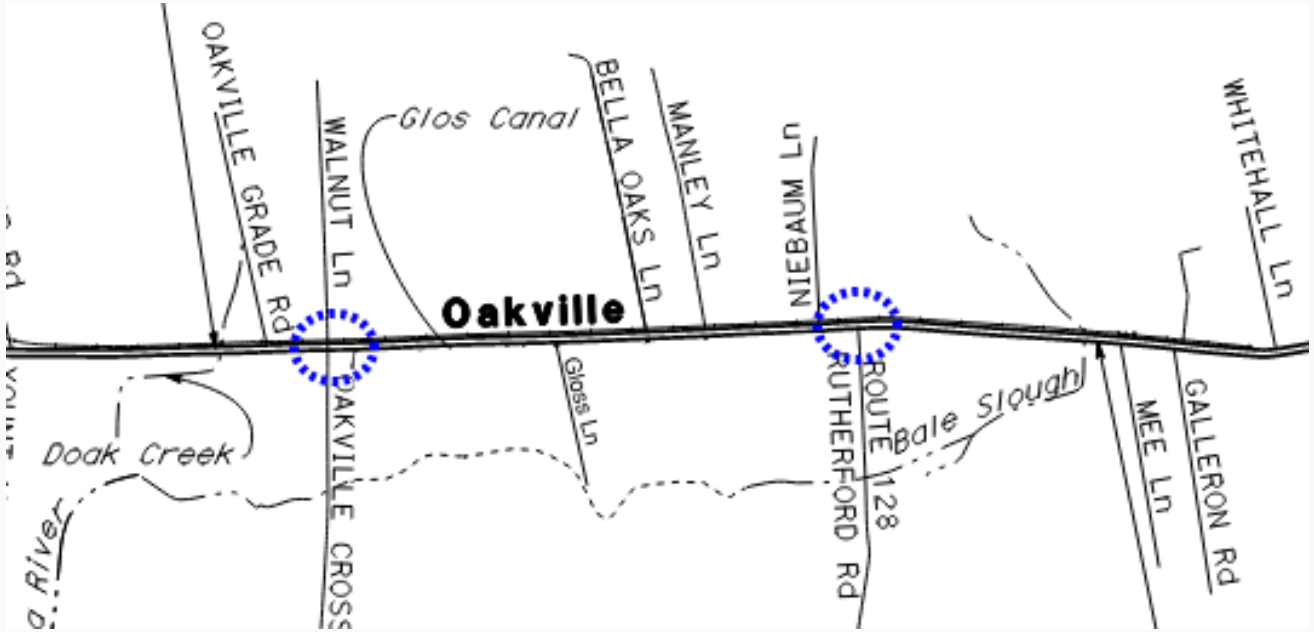
Percentage of vehicles that are trucks presented as a range to capture traffic data collected during weekday AM, weekday PM, and weekend mid-day peak periods.

Opening Year: If facility is a bus, rail or intermodal facility/terminal/transfer point, # of bus arrivals for Build and No Build, % and # of bus arrivals will be diesel buses
N/A

RTP Horizon Year / Design Year: If facility is a bus, rail or intermodal facility/terminal/transfer point, # of bus arrivals for Build and No Build, % and # of bus arrivals will be diesel buses
N/A

Describe potential traffic redistribution effects of congestion relief *(impact on other facilities)*
The proposed project would not add capacity, increase traffic volumes, or change the vehicle mix in the study area. While the proposed project is anticipated to reduce traffic congestion at existing intersections and improve merge operations, these effects are expected to be localized and no traffic redistribution effects are anticipated.

Comments/Explanation/Details (please be brief)



STATE ROUTE 29 (SR-29) IMPROVEMENTS AT RUTHERFORD AND OAKVILLE INTERSECTIONS

Intersection Channelization Project

Project Location: 2.2-mile segment of SR-29 in an unincorporated area of Napa County

The project proposes the improvement of two intersections at:

- SR-29/Rutherford Road (SR-128) in the community of Rutherford (PM 24.59)
- SR-29/Oakville Cross Road in the community of Oakville (PM 22.72)

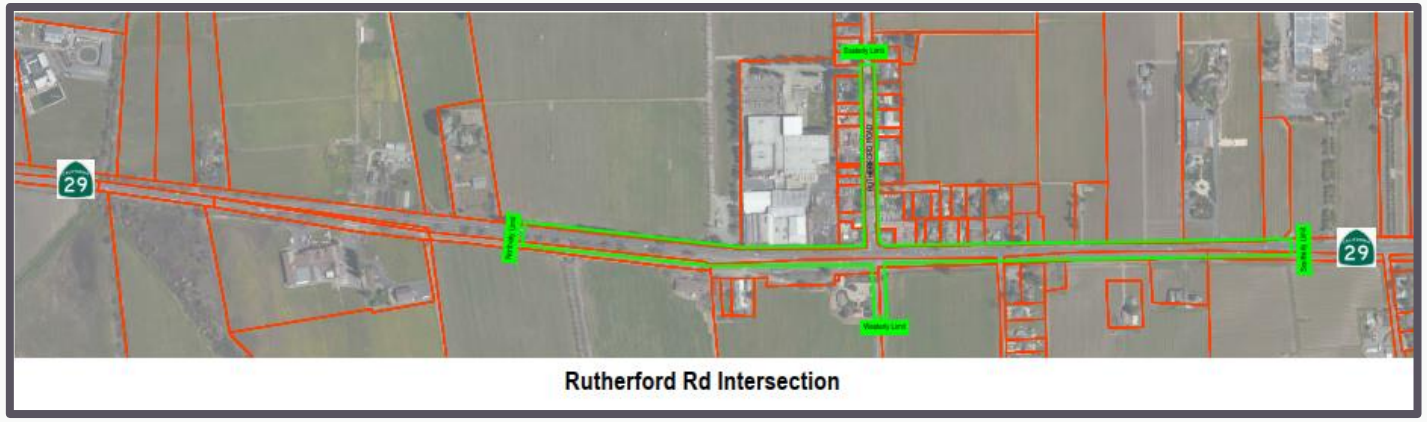
Source: Traffic 2025 and 2035 Forecasts Memorandum (GHD 2022)

Proposed Improvements:

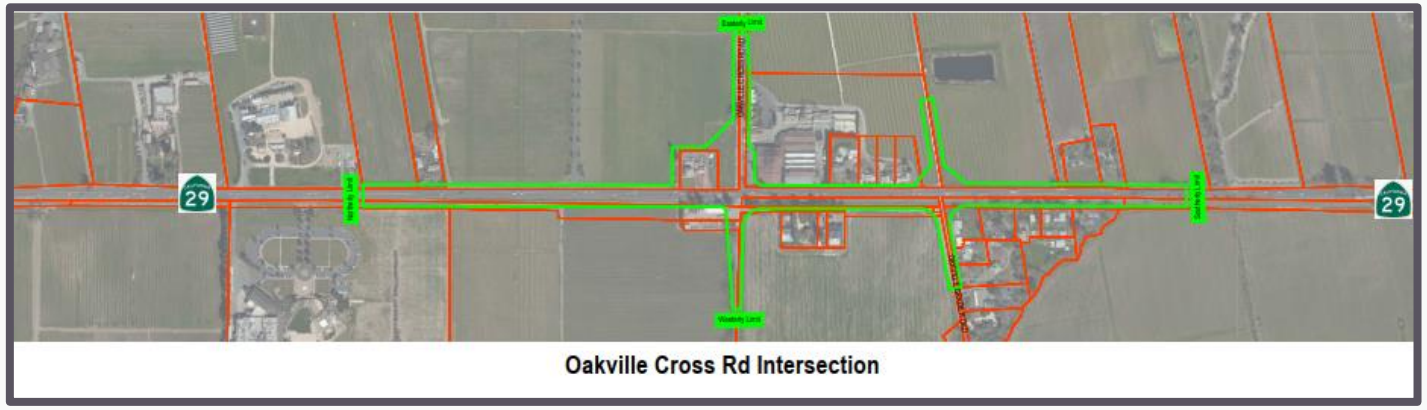
SR-29/Rutherford Road: Traffic signal and/or other traffic calming measures

SR-29/Oakville Cross Road: Single-lane roundabout

Project Area Limits at Each Intersection



Rutherford Rd Intersection



Oakville Cross Rd Intersection

Purpose and Need

The purpose of the project is to enhance safety and traffic operations at the intersections of SR-29 and Oakville Cross Road and SR-29 and Rutherford Road.

- Improve travel time and reduce delay for side streets accessing SR-29.
- Enhance traffic safety.
- Improve turning movements.

The intersections under study have been experiencing poor traffic operation and a high number of collisions due to the lack of protected turning movements.

- The number of collisions exceed statewide average for similar type of facility.
- Poor intersection operation occurs during peak and non-peak periods caused by high traffic volume.
- Lack of protected turning movements to allow for access to and from SR-29 due to insufficient gaps in traffic streaming.

Study Area Traffic Data

The proposed project would not add capacity, increase traffic volumes, or change the vehicle mix in the study area.

Scenario/ Analysis Year	Location	AADT		% Truck
		Total	Truck	
No-Build/Build Year 2025	SR-29 between Oakville Cross Road and Rutherford Road	22,423	359 – 1,816	1.6% - 8.1%
No-Build/Build Year 2035	SR-29 between Oakville Cross Road and Rutherford Road	24,828	397 – 2,011	1.6% - 8.1%
No-Build/Build Year 2050	SR-29 between Oakville Cross Road and Rutherford Road	28,916	463 – 2,342	1.6% - 8.1%

Note: Percentage of vehicles that are trucks presented as a range to capture traffic data collected during weekday AM, weekday PM, and weekend mid-day peak periods.
Source: Traffic 2025 and 2035 Forecasts Memorandum (GHD 2022)

Not a Project of Air Quality Concern

(i) New or expanded highway projects with significant number/increase in diesel vehicles?

- Not a new or expanded highway project
- Intersection safety and operations project - would not increase the capacity of SR-29
- No change in traffic volume or truck percentages on SR-29

(ii) Affects intersections at LOS D, E, or F with a significant number of diesel vehicles?

- Diesel vehicle traffic is not significant in the study area
- No change in traffic volume or truck percentages at intersections
- Proposed project would improve congestion at affected intersections

(iii) New bus and rail terminals and transfer points? —Not Applicable

(iv) Expanded bus and rail terminals and transfer points? —Not Applicable

(v) Affects areas identified in PM_{10} or $PM_{2.5}$ implementation plan as site of violation?

- Not in an area identified in a PM_{10} or $PM_{2.5}$ implementation plan as a site of violation

Questions?

Appendix C - RCEM Input and Output

Road Construction Emissions Model **Version 9.0.1**

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells D10 through D24, E28 through G35, and D38 through D41 for all project types.
Please use "Clear Data Input & User Overrides" button first before changing the Project Type or begin a new project.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	SR-29 Improvements at Rutherford and Oakville Intersections	
Construction Start Year	2024	Enter a Year between 2014 and 2040 (inclusive)
Project Type	2	1) New Road Construction : Project to build a roadway from bare ground, which generally requires more site preparation than widening an existing roadway 2) Road Widening : Project to add a new lane to an existing roadway 3) Bridge/Overpass Construction : Project to build an elevated roadway, which generally requires some different equipment than a new roadway, such as a crane 4) Other Linear Project Type: Non-roadway project such as a pipeline, transmission line, or levee construction
Project Construction Time	12.00	months
Working Days per Month	22.00	days (assume 22 if unknown)
Predominant Soil/Site Type: Enter 1, 2, or 3 (for project within "Sacramento County", follow soil type selection instructions in cells E18 to E20 otherwise see instructions provided in cells J18 to J22)	1	1) Sand Gravel : Use for quaternary deposits (Delta/West County) 2) Weathered Rock-Earth : Use for Laguna formation (Jackson Highway area) or the Ione formation (Scott Road, Rancho Murieta) 3) Blasted Rock : Use for Salt Springs Slate or Copper Hill Volcanics (Folsom South of Highway 50, Rancho Murieta)
Project Length	2.00	miles
Total Project Area	9.50	acres
Maximum Area Disturbed/Day	0.20	acres
Water Trucks Used?	1	1. Yes 2. No

Please note that the soil type instructions provided in cells E18 to E20 are specific to Sacramento County. Maps available from the California Geologic Survey (see weblink below) can be used to determine soil type outside Sacramento County. NEW LINK 8-2-2022.

https://maps.conservation.ca.gov/cgs/gmc/

Material Hauling Quantity Input

Material Type	Phase	Haul Truck Capacity (yd^3) (assume 20 if unknown)	Import Volume (yd^3/day)	Export Volume (yd^3/day)
Soil	Grubbing/Land Clearing			
	Grading/Excavation	15.00		11.36
	Drainage/Utilities/Sub-Grade			
	Paving	17.50		2.65
Asphalt	Grubbing/Land Clearing			
	Grading/Excavation			
	Drainage/Utilities/Sub-Grade			
	Paving	13.15	23.41	

Mitigation Options

On-road Fleet Emissions Mitigation		Select "2010 and Newer On-road Vehicles Fleet" option when the on-road heavy-duty truck fleet for the project will be limited to vehicles of model year 2010 or newer Select "20% NOx and 45% Exhaust PM reduction" option if the project will be required to use a lower emitting off-road construction fleet. The SMAQMD Construction Mitigation Calculator can be used to confirm compliance with this mitigation measure (http://www.airquality.org/Businesses/CEQA-Land-Use-Planning/Mitigation). Select "Tier 4 Equipment" option if some or all off-road equipment used for the project meets CARB Tier 4 Standard
Off-road Equipment Emissions Mitigation		

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells D50 through D53, and F50 through F53.

Construction Periods	User Override of Construction Months	Program Calculated Months	User Override of Phase Starting Date	Program Default Phase Starting Date
Grubbing/Land Clearing		1.20		1/1/2024
Grading/Excavation		4.80		2/7/2024
Drainage/Utilities/Sub-Grade		4.20		7/2/2024
Paving		1.80		11/7/2024
Totals (Months)	12			

Note: Soil Hauling emission default values can be overridden in cells D61 through D64, and F61 through F64.

Soil Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		1	30.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		1	30.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Grading/Excavation (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Paving (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hauling Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.03	0.21	0.01	0.00	0.00	112.01	0.00	0.02	117.26
Tons per const. Period - Grading/Excavation	0.00	0.00	0.01	0.00	0.00	0.00	5.91	0.00	0.00	6.19
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.03	0.21	0.01	0.00	0.00	112.01	0.00	0.02	117.26
Tons per const. Period - Paving	0.00	0.00	0.00	0.00	0.00	0.00	2.22	0.00	0.00	2.32
Total tons per construction project	0.00	0.00	0.02	0.00	0.00	0.00	8.13	0.00	0.00	8.51

Note: Asphalt Hauling emission default values can be overridden in cells D91 through D94, and F91 through F94.

Asphalt Hauling Emissions User Input	User Override of Miles/Round Trip	Program Estimate of Miles/Round Trip	User Override of Truck Round Trips/Day	Default Values Round Trips/Day	Calculated Daily VMT
Miles/round trip: Grubbing/Land Clearing		30.00		0	0.00
Miles/round trip: Grading/Excavation		30.00		0	0.00
Miles/round trip: Drainage/Utilities/Sub-Grade		30.00		0	0.00
Miles/round trip: Paving		30.00		2	60.00

Emission Rates	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Grading/Excavation (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Paving (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grading/Excavation	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pounds per day - Paving	0.00	0.05	0.42	0.01	0.01	0.00	224.02	0.00	0.04	234.52
Tons per const. Period - Paving	0.00	0.00	0.01	0.00	0.00	0.00	4.44	0.00	0.00	4.64
Total tons per construction project	0.00	0.00	0.01	0.00	0.00	0.00	4.44	0.00	0.00	4.64

Note: Worker commute default values can be overridden in cells D121 through D126.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values		
User Input				
Miles/ one-way trip		20		
One-way trips/day		2	Calculated Daily Trips	Calculated Daily VMT
No. of employees: Grubbing/Land Clearing		9	18	360.00
No. of employees: Grading/Excavation		24	48	960.00
No. of employees: Drainage/Utilities/Sub-Grade		18	36	720.00
No. of employees: Paving		14	28	560.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.01	0.84	0.06	0.05	0.02	0.00	306.70	0.00	0.01	308.54
Grading/Excavation (grams/mile)	0.01	0.84	0.06	0.05	0.02	0.00	306.70	0.00	0.01	308.54
Draining/Utilities/Sub-Grade (grams/mile)	0.01	0.84	0.06	0.05	0.02	0.00	306.70	0.00	0.01	308.54
Paving (grams/mile)	0.01	0.84	0.06	0.05	0.02	0.00	306.70	0.00	0.01	308.54
Grubbing/Land Clearing (grams/trip)	0.98	2.66	0.27	0.00	0.00	0.00	65.99	0.07	0.03	76.61
Grading/Excavation (grams/trip)	0.98	2.66	0.27	0.00	0.00	0.00	65.99	0.07	0.03	76.61
Draining/Utilities/Sub-Grade (grams/trip)	0.98	2.66	0.27	0.00	0.00	0.00	65.99	0.07	0.03	76.61
Paving (grams/trip)	0.98	2.66	0.27	0.00	0.00	0.00	65.99	0.07	0.03	76.61
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.05	0.77	0.06	0.04	0.02	0.00	246.04	0.01	0.01	247.92
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	3.25	0.00	0.00	3.27
Pounds per day - Grading/Excavation	0.13	2.06	0.16	0.10	0.04	0.01	656.10	0.01	0.02	661.11
Tons per const. Period - Grading/Excavation	0.01	0.11	0.01	0.01	0.00	0.00	34.64	0.00	0.00	34.91
Pounds per day - Drainage/Utilities/Sub-Grade	0.10	1.54	0.12	0.07	0.03	0.00	492.07	0.01	0.01	495.84
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.07	0.01	0.00	0.00	0.00	22.73	0.00	0.00	22.91
Pounds per day - Paving	0.08	1.20	0.09	0.06	0.02	0.00	382.72	0.01	0.01	385.65
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	7.58	0.00	0.00	7.64
Total tons per construction project	0.01	0.21	0.02	0.01	0.00	0.00	68.20	0.00	0.00	68.72

Note: Water Truck default values can be overridden in cells D153 through D156, I153 through I156, and F153 through F156.

Water Truck Emissions	User Override of Default # Water Trucks	Program Estimate of Number of Water Trucks	User Override of Truck Round Trips/Vehicle/Day	Default Values Round Trips/Vehicle/Day	Calculated Trips/day	User Override of Miles/Round Trip	Default Values Miles/Round Trip	Calculated Daily VMT
User Input								
Grubbing/Land Clearing - Exhaust		1		5	5		8.00	40.00
Grading/Excavation - Exhaust		1		5	5		8.00	40.00
Drainage/Utilities/Subgrade		1		5	5		8.00	40.00
Paving		1		5	5		8.00	40.00

Emission Rates	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Grubbing/Land Clearing (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Grading/Excavation (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Draining/Utilities/Sub-Grade (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Paving (grams/mile)	0.03	0.41	3.02	0.11	0.05	0.02	1,693.55	0.00	0.27	1,772.92
Grubbing/Land Clearing (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Draining/Utilities/Sub-Grade (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving (grams/trip)	0.00	0.00	4.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Emissions	**ROG**	**CO**	**NOx**	**PM10**	**PM2.5**	**SOx**	**CO2**	**CH4**	**N2O**	**CO2e**
Pounds per day - Grubbing/Land Clearing	0.00	0.04	0.32	0.01	0.00	0.00	149.35	0.00	0.02	156.34
Tons per const. Period - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	1.97	0.00	0.00	2.06
Pounds per day - Grading/Excavation	0.00	0.04	0.32	0.01	0.00	0.00	149.35	0.00	0.02	156.34
Tons per const. Period - Grading/Excavation	0.00	0.00	0.02	0.00	0.00	0.00	7.89	0.00	0.00	8.25
Pounds per day - Drainage/Utilities/Sub-Grade	0.00	0.04	0.32	0.01	0.00	0.00	149.35	0.00	0.02	156.34
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.00	0.01	0.00	0.00	0.00	6.90	0.00	0.00	7.22
Pounds per day - Paving	0.00	0.04	0.32	0.01	0.00	0.00	149.35	0.00	0.02	156.34
Tons per const. Period - Paving	0.00	0.00	0.01	0.00	0.00	0.00	2.96	0.00	0.00	3.10
Total tons per construction project	0.00	0.00	0.04	0.00	0.00	0.00	19.71	0.00	0.00	20.64

Note: Fugitive dust default values can be overridden in cells D183 through D185.

Fugitive Dust	User Override of Max Acreage Disturbed/Day	Default Maximum Acreage/Day	PM10 pounds/day	PM10 tons/per period	PM2.5 pounds/day	PM2.5 tons/per period
Fugitive Dust - Grubbing/Land Clearing		0.20	2.00	0.03	0.42	0.01
Fugitive Dust - Grading/Excavation		0.20	2.00	0.11	0.42	0.02
Fugitive Dust - Drainage/Utilities/Subgrade		0.20	2.00	0.09	0.42	0.02

Off-Road Equipment Emissions

Grubbing/Land Clearing	Default Number of Vehicles	Mitigation Option Override of	Default		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*	Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Equipment Tier	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Crawler Tractors	0.42	2.20	4.75	0.18	0.17	0.01	758.65	0.25	0.01	766.83
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Excavators	0.36	6.53	2.81	0.14	0.13	0.01	1,000.53	0.32	0.01	1,011.32
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grubbing/Land Clearing	pounds per day	1.01	9.94	8.99	0.38	0.35	0.02	1,956.44	0.59	0.02	1,976.41
Grubbing/Land Clearing	tons per phase	0.01	0.13	0.12	0.00	0.00	0.00	25.82	0.01	0.00	26.09

Grading/Excavation Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	0		Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Crawler Tractors	0.42	2.20	4.75	0.18	0.17	0.01	758.65	0.25	0.01	766.83
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Excavators	0.54	9.80	4.21	0.21	0.19	0.02	1,500.80	0.49	0.01	1,516.98
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Graders	0.71	3.31	8.31	0.27	0.25	0.01	1,281.02	0.41	0.01	1,294.82
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Rollers	0.29	3.70	3.05	0.16	0.15	0.01	508.29	0.16	0.00	513.77
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Rubber Tired Loaders	0.25	1.50	2.33	0.08	0.07	0.01	605.51	0.20	0.01	612.05
	2		Model Default Tier	Scrapers	1.52	11.93	15.39	0.61	0.56	0.03	2,938.20	0.95	0.03	2,969.87
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Tractors/Loaders/Backhoes	0.58	8.94	5.79	0.27	0.24	0.01	1,207.07	0.39	0.01	1,220.05
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type		ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day	PM2.5 pounds/day	SOx pounds/day	CO2 pounds/day	CH4 pounds/day	N2O pounds/day	CO2e pounds/day
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Grading/Excavation	pounds per day	4.54	42.59	45.27	1.83	1.69	0.09	8,996.79	2.87	0.08	9,092.62
Grading/Excavation	tons per phase	0.24	2.25	2.39	0.10	0.09	0.00	475.03	0.15	0.00	480.09

Drainage/Utilities/Subgrade	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*		Equipment Tier		pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Air Compressors	0.24	2.41	1.63	0.08	0.08	0.00	375.26	0.02	0.00	376.63
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Generator Sets	0.29	3.66	2.54	0.11	0.11	0.01	623.04	0.03	0.00	625.06
	1		Model Default Tier	Graders	0.35	1.66	4.16	0.13	0.12	0.01	640.51	0.21	0.01	647.41
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pavers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Plate Compactors	0.04	0.21	0.25	0.01	0.01	0.00	34.48	0.00	0.00	34.65
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pumps	0.31	3.72	2.58	0.12	0.12	0.01	623.04	0.03	0.00	625.12
			Model Default Tier	Rollers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Rough Terrain Forklifts	0.10	2.29	1.35	0.04	0.04	0.00	333.74	0.11	0.00	337.33
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Scrapers	0.76	5.97	7.70	0.30	0.28	0.02	1,469.10	0.48	0.01	1,484.93
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Tractors/Loaders/Backhoes	0.43	6.71	4.34	0.20	0.18	0.01	905.30	0.29	0.01	915.04
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Drainage/Utilities/Sub-Grade	pounds per day	2.75	27.83	25.98	1.05	1.00	0.05	5,201.71	1.18	0.04	5,244.44
Drainage/Utilities/Sub-Grade	tons per phase	0.13	1.29	1.20	0.05	0.05	0.00	240.32	0.05	0.00	242.29

Paving	Default Number of Vehicles	Mitigation Option Override of Default Equipment Tier (applicable only when "Tier 4 Mitigation" Option Selected)	Default Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Override of Default Number of Vehicles	*Program-estimate*				pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
			Model Default Tier	Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Cranes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crawler Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Excavators	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Graders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other General Industrial Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Other Material Handling Equipm	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	1		Model Default Tier	Pavers	0.18	2.89	1.74	0.08	0.07	0.00	455.16	0.15	0.00	460.07
	1		Model Default Tier	Paving Equipment	0.16	2.57	1.50	0.07	0.07	0.00	394.47	0.13	0.00	398.72
			Model Default Tier	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Pumps	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	2		Model Default Tier	Rollers	0.29	3.70	3.05	0.16	0.15	0.01	508.29	0.16	0.00	513.77
			Model Default Tier	Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	4		Model Default Tier	Signal Boards	0.23	1.20	1.44	0.06	0.06	0.00	197.25	0.02	0.00	198.26
			Model Default Tier	Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	3		Model Default Tier	Tractors/Loaders/Backhoes	0.43	6.71	4.34	0.20	0.18	0.01	905.30	0.29	0.01	915.04
			Model Default Tier	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			Model Default Tier	Welders	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

User-Defined Off-road Equipment

If non-default vehicles are used, please provide information in 'Non-default Off-road Equipment' tab

Number of Vehicles	Equipment Tier	Type	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00	N/A	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

		ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Paving	pounds per day	1.30	17.07	12.07	0.57	0.53	0.03	2,460.48	0.75	0.02	2,485.86
Paving	tons per phase	0.03	0.34	0.24	0.01	0.01	0.00	48.72	0.01	0.00	49.22
Total Emissions all Phases (tons per construction period) =>		0.41	4.00	3.95	0.16	0.15	0.01	789.89	0.23	0.01	797.69

Equipment default values for horsepower and hours/day can be overridden in cells D403 through D436 and F403 through F436.

Equipment	User Override of Horsepower	Default Values Horsepower	User Override of Hours/day	Default Values Hours/day
Aerial Lifts		63		8
Air Compressors		78		8
Bore/Drill Rigs		221		8
Cement and Mortar Mixers		9		8
Concrete/Industrial Saws		81		8
Cranes		231		8
Crawler Tractors		212		8
Crushing/Proc. Equipment		85		8
Excavators		158		8
Forklifts		89		8
Generator Sets		84		8
Graders		187		8
Off-Highway Tractors		124		8
Off-Highway Trucks		402		8
Other Construction Equipment		172		8
Other General Industrial Equipment		88		8
Other Material Handling Equipment		168		8
Pavers		130		8
Paving Equipment		132		8
Plate Compactors		8		8
Pressure Washers		13		8
Pumps		84		8
Rollers		80		8
Rough Terrain Forklifts		100		8
Rubber Tired Dozers		247		8
Rubber Tired Loaders		203		8
Scrapers		367		8
Signal Boards		6		8
Skid Steer Loaders		65		8
Surfacing Equipment		263		8
Sweepers/Scrubbers		64		8
Tractors/Loaders/Backhoes		97		8
Trenchers		78		8
Welders		46		8

END OF DATA ENTRY SHEET

Construction Emissions: RCEM Output

Road Construction Emissions Model, Version 9.0.1

Daily Emission Estimates for -> SR-29 Improvements at Rutherford and Oakville Intersections

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.07	10.74	9.37	2.43	0.43	2.00	0.79	0.37	0.42	0.02	2,351.82	0.59	0.05	2,380.67
Grading/Excavation	4.68	44.71	45.95	3.95	1.95	2.00	2.15	1.74	0.42	0.10	9,914.24	2.88	0.14	10,027.34
Drainage/Utilities/Sub-Grade	2.85	29.41	26.42	3.14	1.14	2.00	1.45	1.03	0.42	0.06	5,843.13	1.19	0.08	5,896.62
Paving	1.39	18.39	13.11	0.66	0.66	0.00	0.57	0.57	0.00	0.03	3,328.57	0.76	0.11	3,379.63
Maximum (pounds/day)	4.68	44.71	45.95	3.95	1.95	2.00	2.15	1.74	0.42	0.10	9,914.24	2.88	0.14	10,027.34
Total (tons/construction project)	0.42	4.23	4.03	0.40	0.17	0.22	0.20	0.16	0.05	0.01	890.37	0.23	0.01	900.21

Notes:

Project Start Year ->	2024
Project Length (months) ->	12
Total Project Area (acres) ->	10
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	360	40
Grading/Excavation	11	0	30	0	960	40
Drainage/Utilities/Sub-Grade	0	0	0	0	720	40
Paving	3	23	30	60	560	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> SR-29 Improvements at Rutherford and Oakville Intersections

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.14	0.12	0.03	0.01	0.03	0.01	0.00	0.01	0.00	31.04	0.01	0.00	28.51
Grading/Excavation	0.25	2.36	2.43	0.21	0.10	0.11	0.11	0.09	0.02	0.01	523.47	0.15	0.01	480.31
Drainage/Utilities/Sub-Grade	0.13	1.36	1.22	0.14	0.05	0.09	0.07	0.05	0.02	0.00	269.95	0.06	0.00	247.14
Paving	0.03	0.36	0.26	0.01	0.01	0.00	0.01	0.01	0.00	0.00	65.91	0.02	0.00	60.71
Maximum (tons/phase)	0.25	2.36	2.43	0.21	0.10	0.11	0.11	0.09	0.02	0.01	523.47	0.15	0.01	480.31
Total (tons/construction project)	0.42	4.23	4.03	0.40	0.17	0.22	0.20	0.16	0.05	0.01	890.37	0.23	0.01	816.66

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Worker Commute Emissions: SAFE Adjustments Applied to RCEM Output

Worker Commute Emissions: RCEM	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.05	0.77	0.06	0.04	0.02	0.00	246.04	0.01	0.01	247.92
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	3.25	0.00	0.00	3.27
Pounds per day - Grading/Excavation	0.13	2.06	0.16	0.10	0.04	0.01	656.10	0.01	0.02	661.11
Tons per const. Period - Grading/Excavation	0.01	0.11	0.01	0.01	0.00	0.00	34.64	0.00	0.00	34.91
Pounds per day - Drainage/Utilities/Sub-Grade	0.10	1.54	0.12	0.07	0.03	0.00	492.07	0.01	0.01	495.84
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.07	0.01	0.00	0.00	0.00	22.73	0.00	0.00	22.91
Pounds per day - Paving	0.08	1.20	0.09	0.06	0.02	0.00	382.72	0.01	0.01	385.65
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	7.58	0.00	0.00	7.64
Total tons per construction project	0.01	0.21	0.02	0.01	0.00	0.00	68.20	0.00	0.00	68.72

SAFE Adjustment Factors for EMFAC2017 Gasoline Light Duty Vehicles

Year: 2024	1	1	1	1	1	1	1.0207	1	1	*

Worker Commute Emissions: SAFE Adjustments	ROG	CO	NOx	PM10	PM2.5	SOx	CO2	CH4	N2O	CO2e
Pounds per day - Grubbing/Land Clearing	0.05	0.77	0.06	0.04	0.02	0.00	251.13	0.01	0.01	253.01
Tons per const. Period - Grubbing/Land Clearing	0.00	0.01	0.00	0.00	0.00	0.00	3.31	0.00	0.00	3.34
Pounds per day - Grading/Excavation	0.13	2.06	0.16	0.10	0.04	0.01	669.68	0.01	0.02	674.69
Tons per const. Period - Grading/Excavation	0.01	0.11	0.01	0.01	0.00	0.00	35.36	0.00	0.00	35.62
Pounds per day - Drainage/Utilities/Sub-Grade	0.10	1.54	0.12	0.07	0.03	0.00	502.26	0.01	0.01	506.02
Tons per const. Period - Drainage/Utilities/Sub-Grade	0.00	0.07	0.01	0.00	0.00	0.00	23.20	0.00	0.00	23.38
Pounds per day - Paving	0.08	1.20	0.09	0.06	0.02	0.00	390.64	0.01	0.01	393.57
Tons per const. Period - Paving	0.00	0.02	0.00	0.00	0.00	0.00	7.73	0.00	0.00	7.79
Total tons per construction project	0.01	0.21	0.02	0.01	0.00	0.00	69.61	0.00	0.00	70.13

* Calculated as: CO2e = CO2 + CH4 * GWP of CH4 + N2O * GWP of N2O

Global Warming Potential of CH_4 (RCEM)	25
Global Warming Potential of N_2O (RCEM)	298

Construction Emissions: SAFE Adjustments Applied to RCEM Output

Road Construction Emissions Model, Version 9.0.1 - With SAFE Adjustments

Daily Emission Estimates for -> SR-29 Improvements at Rutherford and Oakville Intersections Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.07	10.74	9.37	2.43	0.43	2.00	0.79	0.37	0.42	0.02	2,356.91	0.59	0.05	2,385.76
Grading/Excavation	4.68	44.71	45.95	3.95	1.95	2.00	2.15	1.74	0.42	0.10	9,927.82	2.88	0.14	10,040.92
Drainage/Utilities/Sub-Grade	2.85	29.41	26.42	3.14	1.14	2.00	1.45	1.03	0.42	0.06	5,853.32	1.19	0.08	5,906.81
Paving	1.39	18.39	13.11	0.66	0.66	0.00	0.57	0.57	0.00	0.03	3,336.49	0.76	0.11	3,387.55
Maximum (pounds/day)	4.68	44.71	45.95	3.95	1.95	2.00	2.15	1.74	0.42	0.10	9,927.82	2.88	0.14	10,040.92
Total (tons/construction project)	0.42	4.23	4.03	0.40	0.17	0.22	0.20	0.16	0.05	0.01	891.79	0.23	0.01	901.62

Notes:

Project Start Year ->	2024
Project Length (months) ->	12
Total Project Area (acres) ->	10
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	360	40
Grading/Excavation	11	0	30	0	960	40
Drainage/Utilities/Sub-Grade	0	0	0	0	720	40
Paving	3	23	30	60	560	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> SR-29 Improvements at Rutherford and Oakville Intersections Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.14	0.12	0.03	0.01	0.03	0.01	0.00	0.01	0.00	31.11	0.01	0.00	28.58
Grading/Excavation	0.25	2.36	2.43	0.21	0.10	0.11	0.11	0.09	0.02	0.01	524.19	0.15	0.01	481.03
Drainage/Utilities/Sub-Grade	0.13	1.36	1.22	0.14	0.05	0.09	0.07	0.05	0.02	0.00	270.42	0.06	0.00	247.61
Paving	0.03	0.36	0.26	0.01	0.01	0.00	0.01	0.01	0.00	0.00	66.06	0.02	0.00	60.86
Maximum (tons/phase)	0.25	2.36	2.43	0.21	0.10	0.11	0.11	0.09	0.02	0.01	524.19	0.15	0.01	481.03
Total (tons/construction project)	0.42	4.23	4.03	0.40	0.17	0.22	0.20	0.16	0.05	0.01	891.79	0.23	0.01	818.08

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Appendix D – CT-EMFAC2021 Input and Output

Input Parameters

Project	SR-29 Intersection Improvements Project			
Scenario	**2022 Existing**	**2025 No-Build / Build**	**2035 No-Build / Build**	**2050 No-Build / Build**
Area	Napa (SF)	Napa (SF)	Napa (SF)	Napa (SF)
Year	2022	2025	2035	2050
Season	Annual	Annual	Annual	Annual
# of Links	1	1	1	1

Silt Loading Factor	CARB	
Freeway	0.015	g/m2
Major/Collector	0.032	g/m2
Local Urban	0.32	g/m2
Local Rural	0.32	g/m2
Precipitation Correction	CARB	
P	68	days
N	365	days
Number of hours	24	
Number of time periods	1	
Input File	C:\Users\USES722988\Documents\Projects\California\SR-29\Operation Emissions\SR-29_CT-EMFAC2021_Batch Mode_Travel Activity File.xlsx	

Project Name	Scenario	Area	Year	Season	Link Description	Link ID	Time Period	# Hours	Length (m)	Volume (# veh)	Speed Bin (mph)	% Truck	% Truck 1	% Truck 2	Road Type
SR-29 Intersection Improvements Project	2022 Existing	Napa (SF)	2022	Annual	2022 Traffic on 2.2 mile stretch of SR-29	SR-29_2022	Day	24	3540.548	20500	40	6.6			Major/Collector

Project Name	Scenario	Area	Year	Season	Link Description	Link ID	Time Period	# Hours	Length (m)	Volume (# veh)	Speed Bin (mph)	% Truck	% Truck 1	% Truck 2	Road Type
SR-29 Intersection Improvements Project	2025 No-Build / Build	Napa (SF)	2025	Annual	2025 Traffic on 2.2 mile stretch of SR-29	SR-29_2025	Day	24	3540.548	22423	40	6.6			Major/Collector

Project Name	Scenario	Area	Year	Season	Link Description	Link ID	Time Period	# Hours	Length (m)	Volume (# veh)	Speed Bin (mph)	% Truck	% Truck 1	% Truck 2	Road Type
SR-29 Intersection Improvements Project	2035 No-Build / Build	Napa (SF)	2035	Annual	2035 Traffic on 2.2 mile stretch of SR-29	SR-29_2035	Day	24	3540.548	24828	40	6.6			Major/Collector

Project Name	Scenario	Area	Year	Season	Link Description	Link ID	Time Period	# Hours	Length (m)	Volume (# veh)	Speed Bin (mph)	% Truck	% Truck 1	% Truck 2	Road Type
SR-29 Intersection Improvements Project	2050 No-Build / Build	Napa (SF)	2050	Annual	2050 Traffic on 2.2 mile stretch of SR-29	SR-29_2050	Day	24	3540.548	28916	40	6.6			Major/Collector

Total Emissions

General	2022 Existing	2025 No-Build / Build	2035 No-Build / Build	2050 No-Build / Build		Unit
$PM_{2.5}$	1.386E-03	1.489E-03	1.588E-03	1.840E-03		tons/day
PM_{10}	7.203E-03	7.817E-03	8.606E-03	1.018E-02		tons/day
NO_x	9.827E-03	7.786E-03	4.162E-03	2.982E-03		tons/day
CO	5.129E-02	4.459E-02	3.248E-02	3.242E-02		tons/day
HC	3.116E-03	2.852E-03	2.148E-03	1.817E-03		tons/day
TOG	3.402E-03	3.108E-03	2.326E-03	1.955E-03		tons/day
ROG	2.960E-03	2.744E-03	2.090E-03	1.772E-03		tons/day
MSATs						
1,3-Butadiene	4.691E-06	3.815E-06	2.118E-06	1.590E-06		tons/day
Acetaldehyde	2.583E-05	2.272E-05	1.245E-05	6.763E-06		tons/day
Acrolein	3.792E-07	3.233E-07	2.023E-07	1.612E-07		tons/day
Benzene	7.967E-05	6.873E-05	4.533E-05	3.714E-05		tons/day
Diesel PM	6.051E-05	5.441E-05	3.143E-05	1.941E-05		tons/day
Ethylbenzene	3.292E-05	2.970E-05	2.166E-05	1.844E-05		tons/day
Formaldehyde	5.761E-05	5.019E-05	2.752E-05	1.558E-05		tons/day
Naphthalene	4.507E-06	3.513E-06	1.819E-06	1.370E-06		tons/day
POM	1.383E-06	1.171E-06	5.962E-07	3.679E-07		tons/day
DEOG	2.319E-04	2.015E-04	1.121E-04	5.098E-05		tons/day
GHGs						
CO_2	1.674E+01	1.700E+01	1.507E+01	1.572E+01		tons/day
N_2O	7.859E-04	7.639E-04	6.288E-04	6.122E-04		tons/day
CH_4	2.993E-04	2.615E-04	1.974E-04	1.641E-04		tons/day
BC	2.357E-05	2.255E-05	1.300E-05	7.635E-06		tons/day
HFC	3.469E-05	3.009E-05	9.438E-06	9.330E-07		tons/day
CO2e						
CO_2	1.519E+01	1.542E+01	1.368E+01	1.427E+01		metric tons/day CO2e
N_2O	2.125E-01	2.065E-01	1.700E-01	1.655E-01		metric tons/day CO2e
CH_4	6.788E-03	5.930E-03	4.476E-03	3.721E-03		metric tons/day CO2e
BC	9.838E-03	9.411E-03	5.425E-03	3.186E-03		metric tons/day CO2e
HFC	4.501E-02	3.903E-02	1.224E-02	1.210E-03		metric tons/day CO2e
Total CO2e	1.546E+01	1.569E+01	1.387E+01	1.444E+01		metric tons/day CO2e
PM by Process						
$PM_{2.5}$ Running Exhaust	1.115E-04	1.036E-04	6.164E-05	4.159E-05		tons/day
$PM_{2.5}$ Tire Wear	1.076E-04	1.179E-04	1.316E-04	1.551E-04		tons/day
$PM_{2.5}$ Brake Wear	2.949E-04	3.184E-04	3.376E-04	3.786E-04		tons/day
$PM_{2.5}$ Road Dust	8.717E-04	9.488E-04	1.057E-03	1.265E-03		tons/day
PM_{10} Running Exhaust	1.189E-04	1.105E-04	6.577E-05	4.445E-05		tons/day
PM_{10} Tire Wear	4.305E-04	4.717E-04	5.265E-04	6.202E-04		tons/day
PM_{10} Brake Wear	8.424E-04	9.098E-04	9.646E-04	1.082E-03		tons/day
PM_{10} Road Dust	5.811E-03	6.325E-03	7.049E-03	8.434E-03		tons/day

General	2022 Existing	2025 No-Build / Build	2035 No-Build / Build	2050 No-Build / Build		Unit
$PM_{2.5}$	2.771E+00	2.978E+00	3.176E+00	3.681E+00		pounds/day
PM_{10}	1.441E+01	1.563E+01	1.721E+01	2.036E+01		pounds/day
NO_x	1.965E+01	1.557E+01	8.325E+00	5.965E+00		pounds/day
CO	1.026E+02	8.919E+01	6.496E+01	6.484E+01		pounds/day
HC	6.232E+00	5.703E+00	4.297E+00	3.635E+00		pounds/day
TOG	6.805E+00	6.216E+00	4.652E+00	3.911E+00		pounds/day
ROG	5.921E+00	5.489E+00	4.179E+00	3.544E+00		pounds/day
MSATs						
1,3-Butadiene	9.383E-03	7.631E-03	4.236E-03	3.179E-03		pounds/day
Acetaldehyde	5.166E-02	4.544E-02	2.491E-02	1.353E-02		pounds/day
Acrolein	7.585E-04	6.465E-04	4.045E-04	3.224E-04		pounds/day
Benzene	1.593E-01	1.375E-01	9.066E-02	7.428E-02		pounds/day
Diesel PM	1.210E-01	1.088E-01	6.287E-02	3.883E-02		pounds/day
Ethylbenzene	6.584E-02	5.940E-02	4.333E-02	3.689E-02		pounds/day
Formaldehyde	1.152E-01	1.004E-01	5.504E-02	3.116E-02		pounds/day
Naphthalene	9.014E-03	7.027E-03	3.638E-03	2.739E-03		pounds/day
POM	2.766E-03	2.342E-03	1.192E-03	7.357E-04		pounds/day
DEOG	4.639E-01	4.030E-01	2.243E-01	1.020E-01		pounds/day
GHGs						
CO_2	3.348E+04	3.400E+04	3.015E+04	3.145E+04		pounds/day
N_2O	1.572E+00	1.528E+00	1.258E+00	1.224E+00		pounds/day
CH_4	5.986E-01	5.229E-01	3.947E-01	3.281E-01		pounds/day
BC	4.715E-02	4.510E-02	2.600E-02	1.527E-02		pounds/day
HFC	6.939E-02	6.017E-02	1.888E-02	1.866E-03		pounds/day
PM by Process						
$PM_{2.5}$ Running Exhaust	2.231E-01	2.073E-01	1.233E-01	8.318E-02		pounds/day
$PM_{2.5}$ Tire Wear	2.153E-01	2.358E-01	2.633E-01	3.101E-01		pounds/day
$PM_{2.5}$ Brake Wear	5.897E-01	6.369E-01	6.753E-01	7.573E-01		pounds/day
$PM_{2.5}$ Road Dust	1.743E+00	1.898E+00	2.115E+00	2.530E+00		pounds/day
PM_{10} Running Exhaust	2.377E-01	2.210E-01	1.315E-01	8.889E-02		pounds/day
PM_{10} Tire Wear	8.610E-01	9.433E-01	1.053E+00	1.240E+00		pounds/day
PM_{10} Brake Wear	1.685E+00	1.820E+00	1.929E+00	2.164E+00		pounds/day
PM_{10} Road Dust	1.162E+01	1.265E+01	1.410E+01	1.687E+01		pounds/day

General	2022 Existing	2025 No-Build / Build	2035 No-Build / Build	2050 No-Build / Build		Unit
$PM_{2.5}$	1.257E+03	1.351E+03	1.441E+03	1.670E+03		grams/day
PM_{10}	6.535E+03	7.092E+03	7.807E+03	9.236E+03		grams/day
NO_x	8.915E+03	7.063E+03	3.776E+03	2.706E+03		grams/day
CO	4.653E+04	4.046E+04	2.946E+04	2.941E+04		grams/day
HC	2.827E+03	2.587E+03	1.949E+03	1.649E+03		grams/day
TOG	3.087E+03	2.819E+03	2.110E+03	1.774E+03		grams/day
ROG	2.686E+03	2.490E+03	1.896E+03	1.607E+03		grams/day
MSATs						
1,3-Butadiene	4.256E+00	3.461E+00	1.921E+00	1.442E+00		grams/day
Acetaldehyde	2.343E+01	2.061E+01	1.130E+01	6.136E+00		grams/day
Acrolein	3.440E-01	2.933E-01	1.835E-01	1.463E-01		grams/day
Benzene	7.228E+01	6.235E+01	4.112E+01	3.369E+01		grams/day
Diesel PM	5.490E+01	4.936E+01	2.852E+01	1.761E+01		grams/day
Ethylbenzene	2.987E+01	2.694E+01	1.965E+01	1.673E+01		grams/day
Formaldehyde	5.226E+01	4.553E+01	2.497E+01	1.413E+01		grams/day
Naphthalene	4.089E+00	3.187E+00	1.650E+00	1.242E+00		grams/day
POM	1.255E+00	1.062E+00	5.409E-01	3.337E-01		grams/day
DEOG	2.104E+02	1.828E+02	1.017E+02	4.625E+01		grams/day
GHGs						
CO_2	1.519E+07	1.542E+07	1.368E+07	1.427E+07		grams/day
N_2O	7.130E+02	6.930E+02	5.704E+02	5.554E+02		grams/day
CH_4	2.715E+02	2.372E+02	1.790E+02	1.488E+02		grams/day
BC	2.139E+01	2.046E+01	1.179E+01	6.927E+00		grams/day
HFC	3.147E+01	2.729E+01	8.562E+00	8.464E-01		grams/day
PM by Process						
$PM_{2.5}$ Running Exhaust	1.012E+02	9.402E+01	5.592E+01	3.773E+01		grams/day
$PM_{2.5}$ Tire Wear	9.764E+01	1.070E+02	1.194E+02	1.407E+02		grams/day
$PM_{2.5}$ Brake Wear	2.675E+02	2.889E+02	3.063E+02	3.435E+02		grams/day
$PM_{2.5}$ Road Dust	7.908E+02	8.607E+02	9.592E+02	1.148E+03		grams/day
PM_{10} Running Exhaust	1.078E+02	1.003E+02	5.966E+01	4.032E+01		grams/day
PM_{10} Tire Wear	3.905E+02	4.279E+02	4.776E+02	5.627E+02		grams/day
PM_{10} Brake Wear	7.642E+02	8.254E+02	8.751E+02	9.814E+02		grams/day
PM_{10} Road Dust	5.272E+03	5.738E+03	6.394E+03	7.651E+03		grams/day

Appendix E - EPA CO Letter and CO Flow Chart (Based on the CO Protocol)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

MAR 21 2018

Muhaned Aljabiry, Chief
Office of Federal Transportation Management Program
California Department of Transportation
1120 N Street, Rm 4400, MS-82
Sacramento, CA 95814

Dear Mr. Aljabiry:

The U.S. Environmental Protection Agency (EPA) is providing this letter to document that the transportation conformity requirements under Clean Air Action (CAA) section 176(c) for the Carbon Monoxide (CO) maintenance areas included in the table below will end on June 1, 2018. This date marks 20 years from the redesignation of the areas to attainment for the CO National Ambient Air Quality Standard (NAAQS)[1].

California Carbon Monoxide Maintenance Areas

Bakersfield	Chico
Fresno	Modesto
Lake Tahoe North Shore	Lake Tahoe South Shore
Sacramento	San Diego
San Francisco-Oakland-San Jose	Stockton

Under 40 CFR 93.102(b)(4) of the EPA's regulations, transportation conformity applies to maintenance areas through the 20-year maintenance planning period, unless the maintenance plan specifies that the transportation conformity requirements apply for a longer time period. Pursuant to CAA's section 176(c)(5) and as explained in the preamble of the 1993 final rule, conformity applies to areas that are designated nonattainment or are subject to a maintenance plan approved under CAA section 175A. The section 175A maintenance planning period is 20 years, unless the applicable implementation plan specifies a longer maintenance period[2]. The EPA further clarified this conformity provision in its January 24, 2008 final rule[3].

The approved maintenance plan for these areas did not extend the maintenance plan period beyond 20 years from redesignation. Consequently, transportation conformity requirements for CO will cease to apply after June 1, 2018 (i.e., 20 years after the effective date of the EPA's approval of the first 10-year maintenance plan and redesignation of the areas to attainment for the CO NAAQS). As a result, these areas' Metropolitan Planning Organizations may reference this letter to indicate that as of June 1, 2018,

1 *See* 63 FR 15305 (March 31, 1998) (approval of redesignation request and first 10-year maintenance plan) and 70 FR 71776 (November 30, 2005) (approval of second 10-year maintenance plan)
2 *See* 58 FR 62188, 62206 (November 24, 1993)
3 *See* 73 FR 4420, at 4434-5 (January 24, 2008)

transportation conformity requirements no longer apply for the CO NAAQS for Federal Highway Administration / Federal Transit Association projects as defined in 40 CFR 93.101. Even though the conformity obligation for CO has ended, the terms of the maintenance plans remain in effect and all measures and requirements contained in the plans apply until the state submits, and the EPA approves, a revision to the state plan[4]. Such a State Implementation Plan revision would have to comply with the anti-backsliding requirements of CAA section 110(l), and if applicable, CAA section 193, if the intent of the revision is to remove a control measure or to reduce its stringency.

If you have any questions about the transportation conformity requirements, please contact me at (415) 972-3183 or Karina O'Connor of my staff at (775) 434-8176.

Sincerely,

Elizabeth J. Adams

Elizabeth L. Adams
Acting Director, Air Division

cc: Rodeny Langstaff, Caltrans
Nesamani Kalandiyur, California Air Resources Board
Tasha Clemons, Federal Highway Administration
Stew Sonnenberg, Federal Highway Administration
Christina Leach, Federal Highway Administration
Ted Matley, Federal Transit Administration
Ahron Hakimi, Kern Council of Governments
Jon Clark, Butte County Association of Governments
Steve Heminger, Metropolitan Transportation Commission
James Corless, Sacramento Area Council of Governments
Kim Kawanda, San Diego Association of Governments
Tony Boren, Fresno Council of Governments
Rosa De Leon Park, Stanislaus Council of Governments
Andrew Chesley, San Joaquin Council of Governments
Joanne Marchetta, Tahoe Regional Planning Association

4 See *General Motors Corp. v. United States*, 496 U.S. 530 (1990)

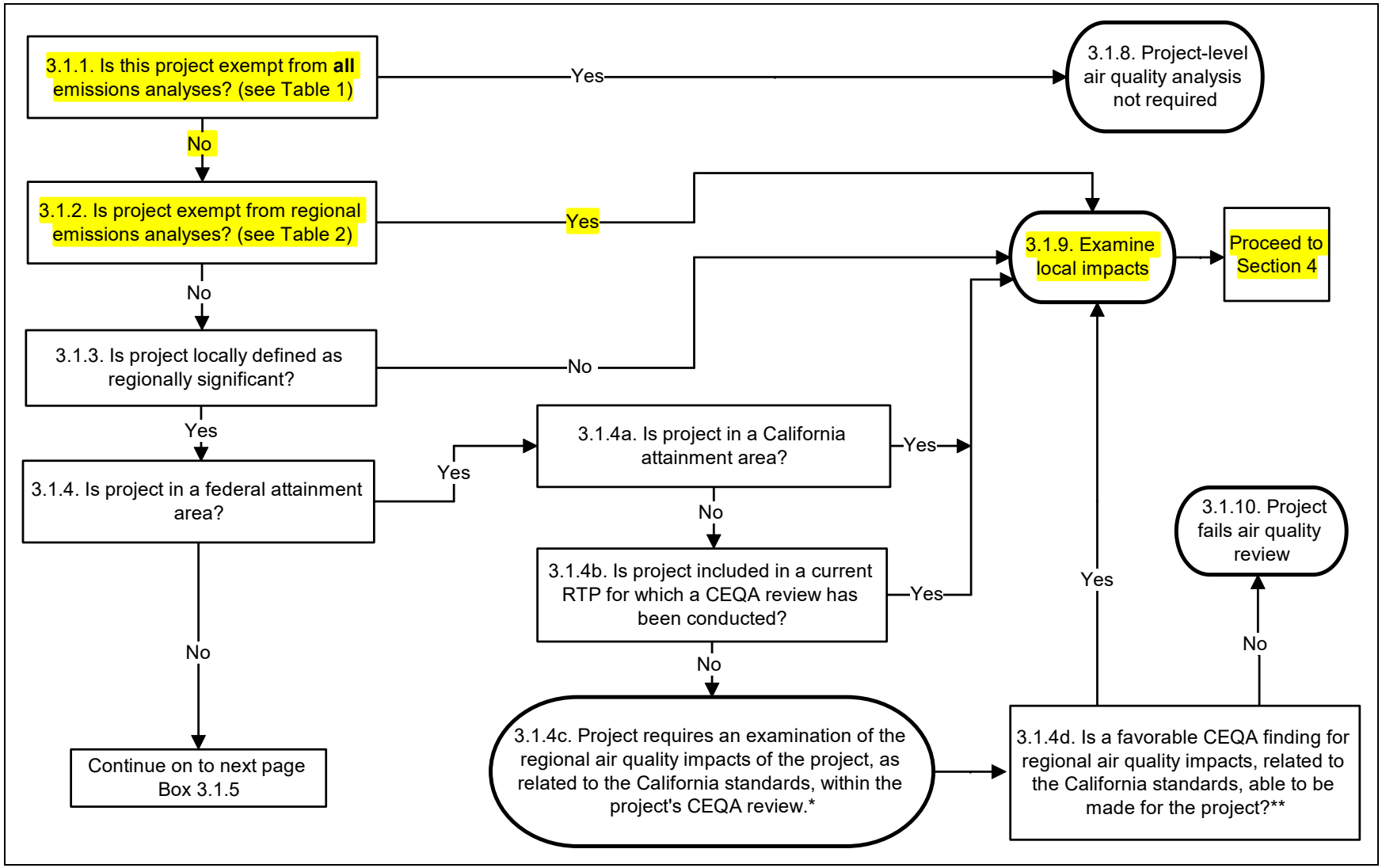


Figure 1. Requirements for New Projects

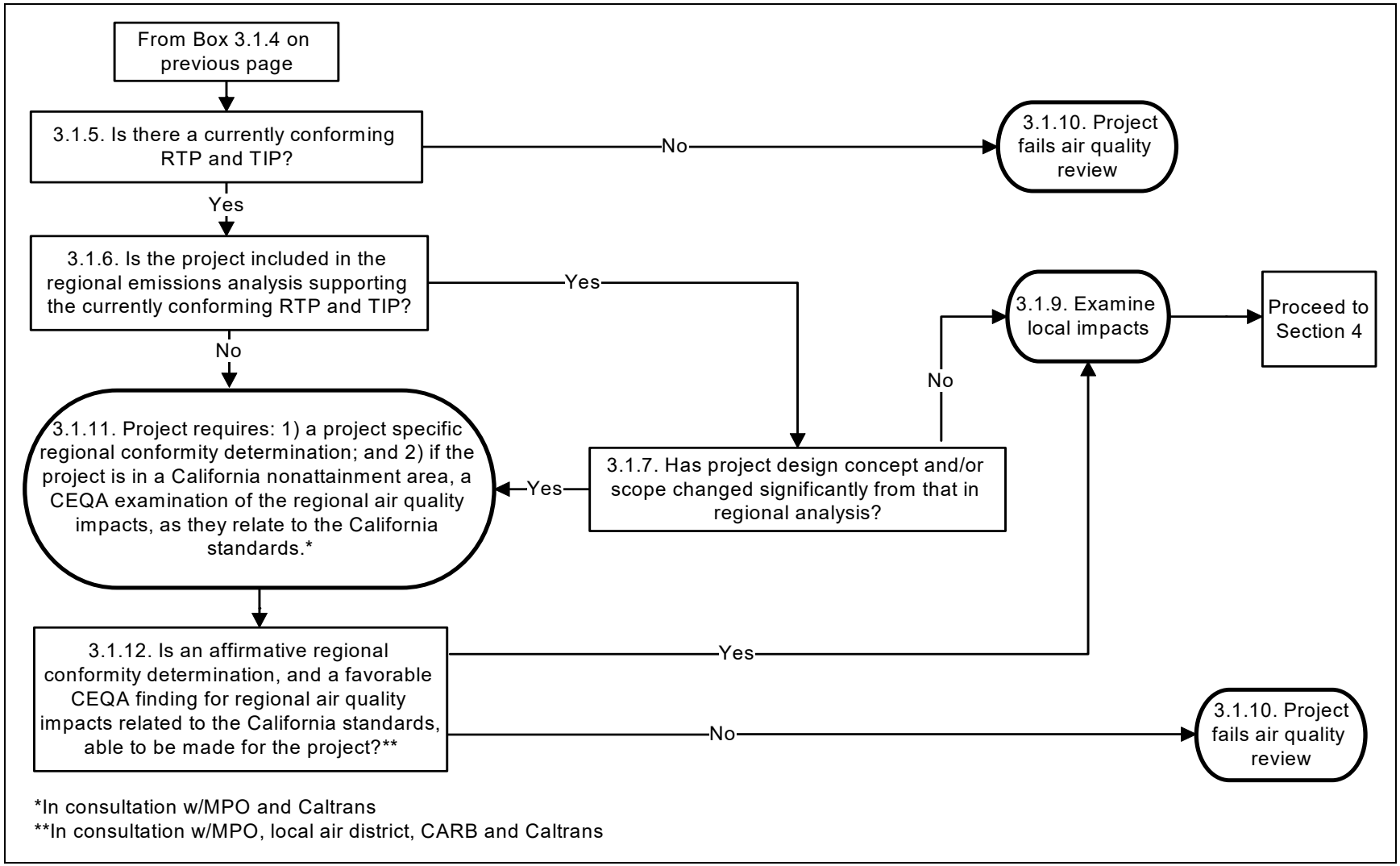


Figure 1 (cont.). Requirements for New Projects

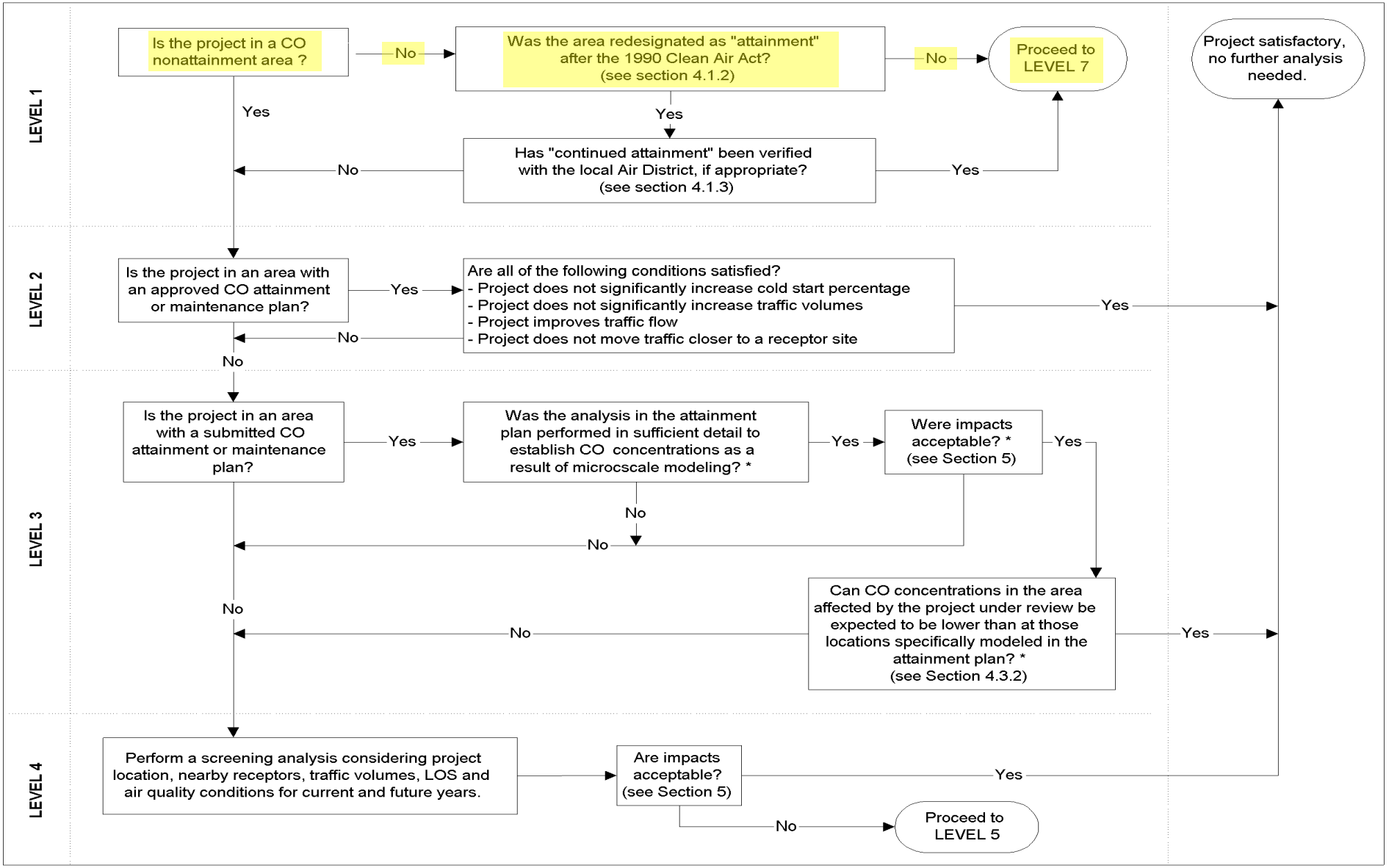


Figure 3. Local CO Analysis

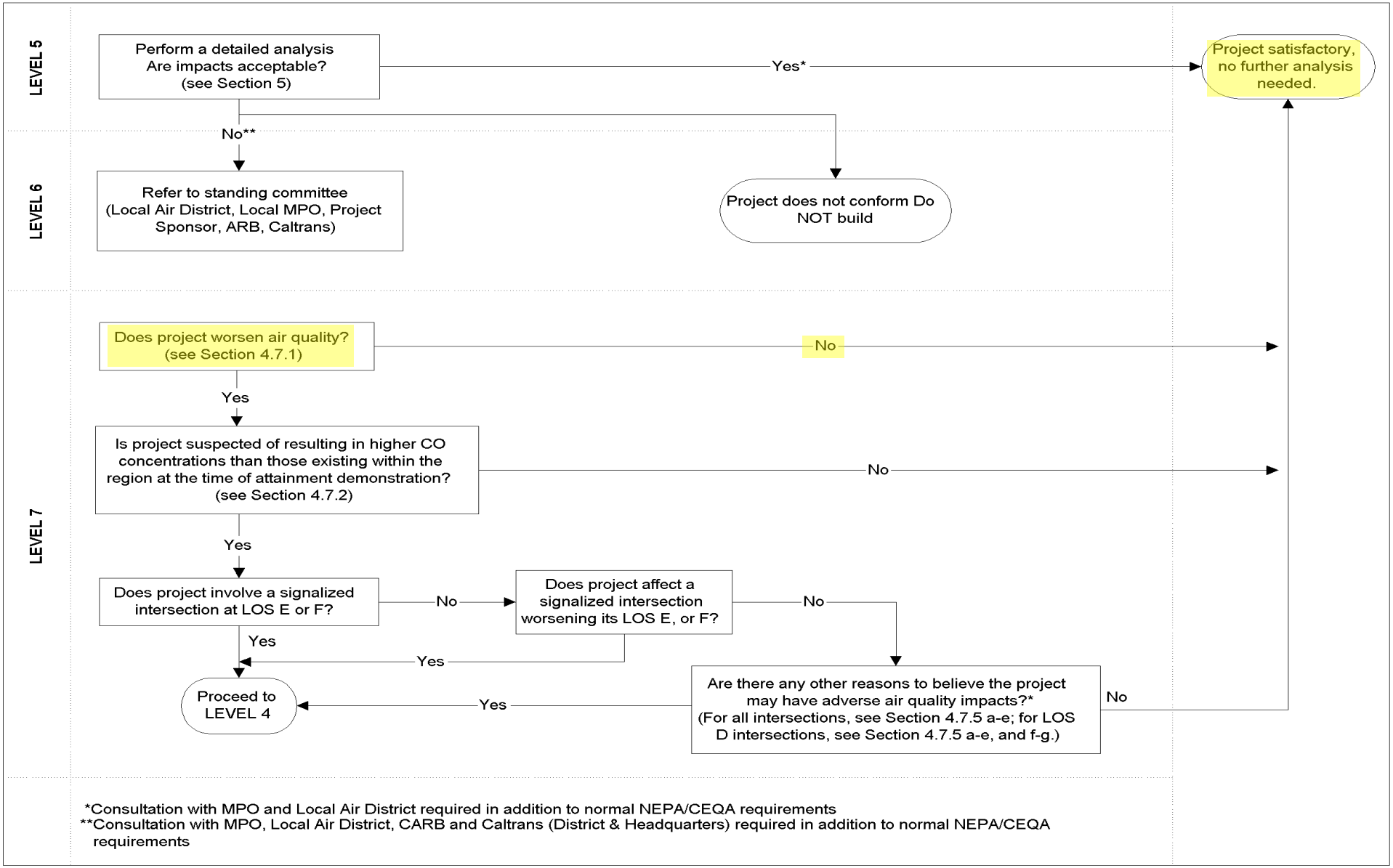


Figure 3 (cont.). Local CO Analysis