AIR QUALITY REPORT
Markham Street Extension Project

Woodcrest Community, Riverside County, California

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HDR

February 2023

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List of Abbreviated Terms

Acronym	Definition
AADT	annual average daily traffic
AB	Assembly Bill
ACM	asbestos-containing materials
AQMP	Air Quality Management Plan
CAA	Clean Air Act
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO Protocol	Transportation Project-Level Carbon Monoxide Protocol
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of Riverside Transportation Department
DPM	diesel particulate matter
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FTIP	Federal Transportation Improvement Program
GHG	greenhouse gas
LOS	level of service
MT	metric tons
MMT	million metric tons
mph	miles per hour
MPO	Metropolitan Planning Organization
MSAT	mobile-source air toxic
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
O_3	ozone
OC	overcrossing
Pb	lead
PM	particulate matter
PM_{10}	particulate matter 10 microns or less in diameter
$PM_{2.5}$	particulate matter 2.5 microns or less in diameter
POAQC	project of air quality concern
ROG	reactive organic gases
RTP	Regional Transportation Plan
SB	Senate Bill

Acronym	Definition
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SIP	State Implementation Plan
SO_2	sulfur dioxide
TAC	toxic air contaminant
Transportation Conformity Guidance	Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM_{10} and $PM_{2.5}$ Nonattainment and Maintenance Areas
USC	United States Code
U.S. EPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled
VOC	volatile organic compound

Chapter 1 Proposed Project Description

1.1 Introduction

The County of Riverside Transportation Department (County) is proposing improvements to Markham Street by extending the roadway between Roosevelt Street and Wood Road for approximately 1.3 miles in the Woodcrest community in Riverside County, California (Figure 1-1 and Figure 1-2). The purpose of the Markham Street Extension Project (Project) is to improve traffic circulation systems within the community. Markham Street, in its ultimate classification, is designated as a secondary highway per the Riverside County General Plan (2015). The Project would construct a roadway section consisting of two lanes with one lane in each direction, Class II bike lanes, and a sidewalk on the south side of Markham Street. The Project is subject to the requirements of the California Environmental Quality Act (CEQA). The County will serve as the CEQA lead for the proposed Project.

1.2 Location and Background

The proposed Project is located between the intersection of Markham Street and Roosevelt Street and the intersection of Wood Road and Markham Street. Each of these intersections have been partially developed as part of previous roadway work. Markham Street, west of Roosevelt Street and east of Wood Street, has been improved to meet the secondary street classification standards. However, Markham Street, east of Roosevelt Street, is an unpaved dirt road and is not accessible from the Markham Street and Roosevelt Street intersection. There is an existing metal beam guardrail that blocks access to the dirt road segment of Markham Street. From the intersection of Wood Road to the west, Markham Street has been paved with a 20-foot-wide asphalt surface to provide access to the existing properties for a distance of 2,500 feet. Along this paved section, driveways to the existing properties have been set back to allow for roadway widening. The unpaved dirt road on the west-end of the Project extends approximately 0.5 mile to the east where it ties into the exiting paved roadway. Additionally, smaller street intersections, including Oran Drive, Birch Street, Cedar Street, and James Kenny Road connect to Markham Street within the Project area.

The proposed Project is located in a semi-rural area with residential, commercial, and institutional land uses throughout the area. Adjacent properties along this roadway segment consist of vacant land, single-family homes, business properties, and water district properties utilized for a sewer-lift station and water-pumping station. Existing utilities consist of an overhead power line, water lines, a gas line, and communication lines.

Figure 1-1. Regional Vicinity and Location Map

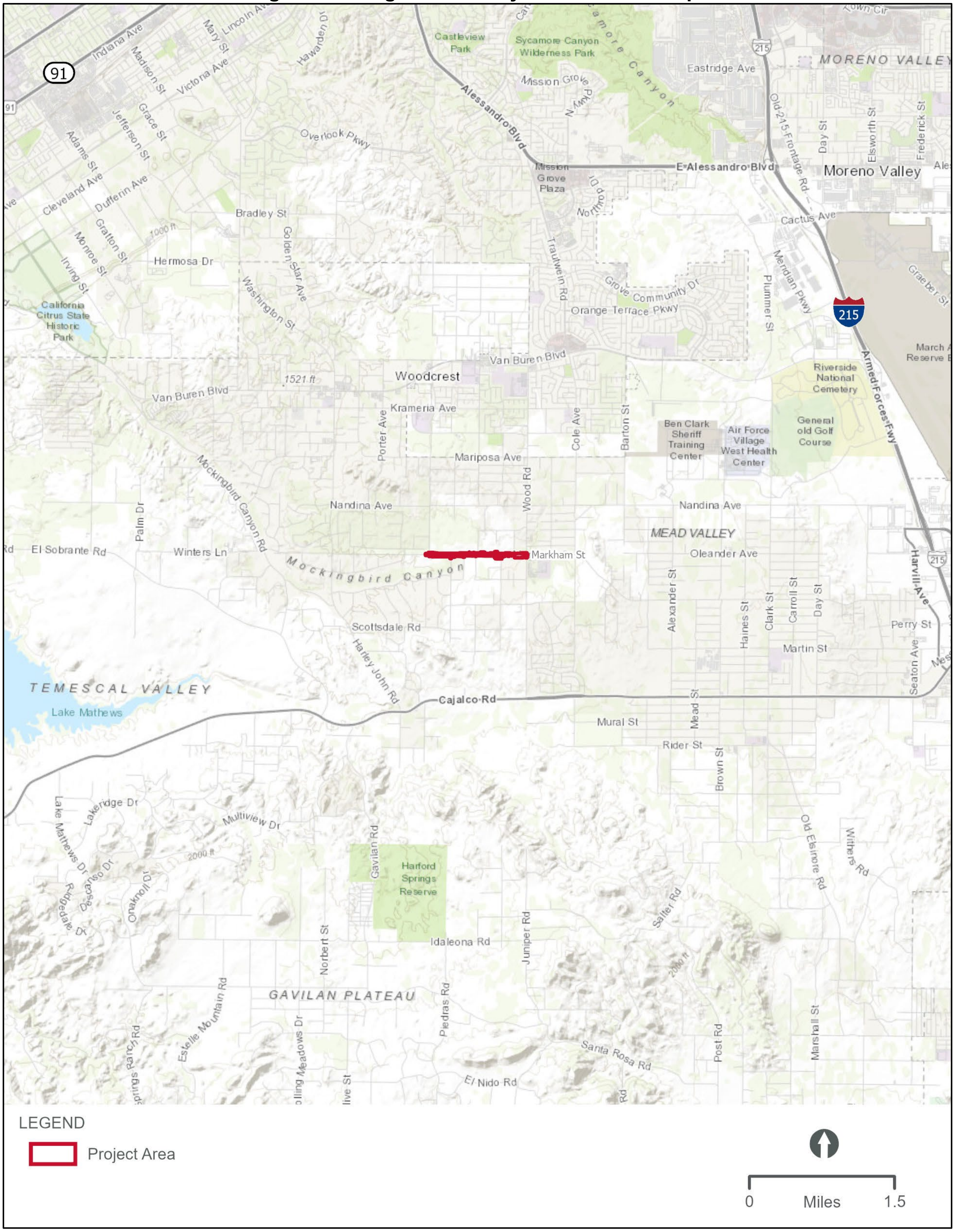
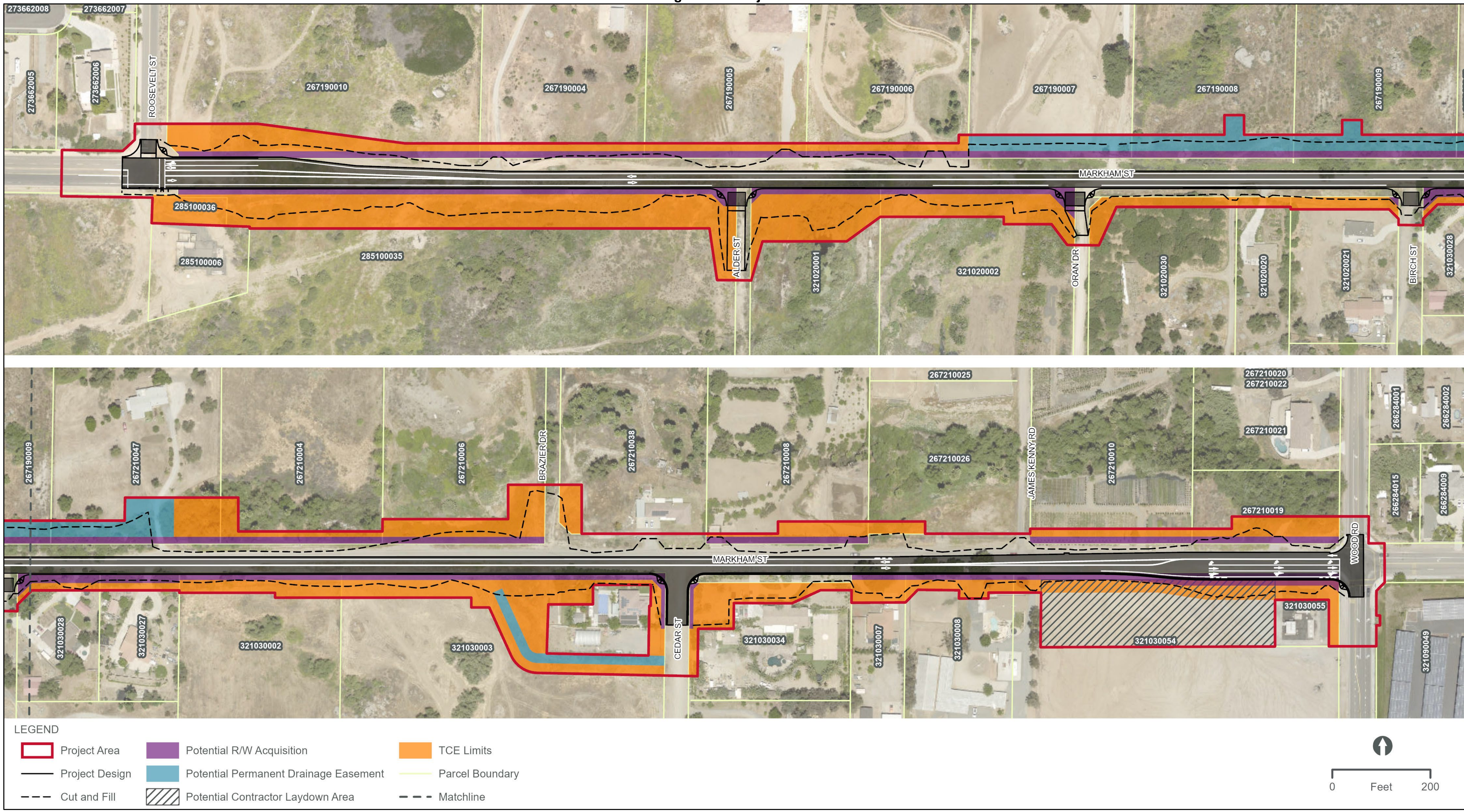


Figure 1-2. Project Area



1.3 Baseline and Forecast Conditions for No-Build Alternative and Build Alternative

The County is evaluating two alternatives, a Build Alternative (Project) and No-Build Alternative, with the proposed Project's Existing Year identified as 2021, the Opening Year (2026), and the Horizon Year (2046). Each alternative is discussed below.

A Traffic Impact Assessment (TIA) Memorandum (HDR 2022a) was prepared for the Project in February 2022, which had analyzed traffic volumes for Opening Year (2024) and Horizon Year (2044). Since the completion of the February 2022 TIA Memorandum, the completion date of construction has been pushed to 2026. Therefore, a Supplemental TIA Memorandum (HDR 2022b) was prepared to evaluate updated traffic volumes for Opening Year (2026) and Horizon Year (2046). Overall, the traffic impact conclusions contained in the February 2022 TIA Memo are consistent with the findings of the Supplemental TIA Memorandum.

1.3.1 Existing Roadways and Traffic Conditions

At present, Markham Street is an east-west two-lane Collector Highway and consists of a rural paved road and a dirt road which ends east of Roosevelt Street. The Project's TIA used roadway segment traffic volumes and intersection turning movement counts collected in September 2021 (HDR 2022a). For the purposes of the traffic impact analysis, Existing Year (2021) conditions serve as the CEQA baseline, which reflects the beginning of environmental study preparation for the proposed Project. Table 1-1 shows existing roadway segment traffic volumes which would be used to develop future forecasts. Intersection turning movement counts during AM and PM peak hours were conducted for four intersections along Markham Street. Table 1-2 shows the existing peak hour turning movements for the four study intersections along Markham Street.

Table 1-1. Existing Year (2021) Roadway Segment Bi-Direction Average Daily Traffic

Roadway Segment	Location	Existing 2021 ADT
Markham Street	West of Roosevelt Street	183
Markham Street	Between Roosevelt Street and Wood Road	502
Markham Street	East of Wood Road	2,973
Roosevelt Street	North of Markham Street	131
Wood Road	North of Markham Street	6,319
Wood Road	South of Markham Street	6,672
Mariposa Avenue	Between Roosevelt Street and Wood Road	813
Cajalco Road	Between Harley John Road and Wood Road	23,347

Source: HDR 2022a
Note: ADT=average daily traffic

Table 1-2. Existing Year (2021) Intersection Peak Hour Volumes

AM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	1	0	10	10	1	0	0	8	1
Birch Street & Markham Street	0	0	5	0	0	0	0	9	0	4	12	0
Cedar Street & Markham Street	1	0	9	0	0	0	0	13	1	4	15	0
Wood Road & Markham Street	2	222	115	46	197	9	15	8	4	161	12	57
PM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	4	0	6	9	4	0	0	1	1
Birch Street & Markham Street	0	0	3	0	0	0	0	10	1	4	5	0
Cedar Street & Markham Street	0	0	5	0	0	0	0	10	0	7	7	0
Wood Road & Markham Street	1	226	143	78	238	13	10	2	2	73	2	47

Source: HDR 2022a
Note: NBL=Northbound left; NBT=Northbound through; NBR=Northbound right; SBL=Southbound left; SBT=Southbound through; SBR=Southbound right EBL=Eastbound left; EBT=Eastbound through; EBR=Eastbound right; WBL=Westbound left; WBT= Westbound through; WBR= Westbound right

1.3.2 No-Build Alternative

The No-Build Alternative represents future travel conditions along Markham Street without the proposed Project and serves as the baseline against which the proposed Project's Build Alternative will be assessed to evaluate CEQA impacts.

The lane configuration under the No-Build Alternative was assumed to remain the same as that under the existing conditions. Peak hour turning movements for the Supplemental TIA Memorandum intersections along Markham Street under the Opening Year (2026) No-Build condition and Horizon Year (2046) No-Build condition are shown in Table 1-3 and Table 1-4, respectively.

Table 1-3. Opening Year (2026) No-Build Condition Intersection Peak Hour Volumes

AM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	1	0	10	10	1	0	0	8	1
Birch Street & Markham Street	0	0	5	0	0	0	0	9	0	4	12	0
Cedar Street & Markham Street	1	0	9	0	0	0	0	14	1	4	16	0
Wood Road & Markham Street	2	238	119	47	201	9	15	8	4	166	12	59
PM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	4	0	6	9	4	0	0	1	1
Birch Street & Markham Street	0	0	3	0	0	0	0	10	1	4	5	0
Cedar Street & Markham Street	0	0	5	0	0	0	0	10	0	7	7	0
Wood Road & Markham Street	1	233	155	96	257	13	10	2	2	75	2	47

Source: HDR 2022b
Note: NBL=Northbound left; NBT=Northbound through; NBR=Northbound right; SBL=Southbound left; SBT=Southbound through; SBR=Southbound right EBL=Eastbound left; EBT=Eastbound through; EBR=Eastbound right; WBL=Westbound left; WBT= Westbound through; WBR= Westbound right

Table 1-4. Horizon Year (2046) No-Build Condition Intersection Peak Hour Volumes

AM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	1	0	12	12	1	0	0	10	1
Birch Street & Markham Street	0	0	6	0	0	0	0	11	0	5	14	0
Cedar Street & Markham Street	1	0	11	0	0	0	0	16	1	5	18	0
Wood Road & Markham Street	3	300	133	53	218	10	15	9	5	187	12	66
PM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	5	0	7	11	5	0	0	1	1
Birch Street & Markham Street	0	0	4	0	0	0	0	12	1	5	6	0
Cedar Street & Markham Street	0	0	6	0	0	0	0	12	0	8	8	0
Wood Road & Markham Street	1	260	204	169	334	14	12	3	2	84	2	49

Source: HDR 2022b
Note: NBL=Northbound left; NBT=Northbound through; NBR=Northbound right; SBL=Southbound left; SBT=Southbound through; SBR=Southbound right EBL=Eastbound left; EBT=Eastbound through; EBR=Eastbound right; WBL=Westbound left; WBT= Westbound through; WBR= Westbound right

1.3.3 Build Alternative

The Build Alternative evaluated intersection turning counts for Opening Year (2026) and Horizon Year (2046). As discussed previously, the Project's proposed lane configuration will be a two-lane collector. Peak hour turning movements for the TIA study intersections along Markham Street under the Opening Year (2026) Build condition and Horizon Year (2046) Build condition are shown in Table 1-5 and Table 1-6, respectively.

Table 1-5. Opening Year (2026) Build Condition Intersection Peak Hour Volumes

AM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	5	0	10	10	114	0	0	525	5
Birch Street & Markham Street	0	0	23	0	0	0	0	151	0	11	526	0
Cedar Street & Markham Street	5	0	15	0	0	0	0	128	41	4	479	0
Wood Road & Markham Street	43	238	22	6	189	45	61	53	14	85	397	35
PM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	4	0	6	11	553	0	0	208	6
Birch Street & Markham Street	0	0	12	0	0	0	0	585	16	12	216	0
Cedar Street & Markham Street	0	0	19	0	0	0	0	545	0	7	214	0
Wood Road & Markham Street	54	273	52	5	178	22	54	387	31	26	160	4

Source: HDR 2022b
Note: NBL=Northbound left; NBT=Northbound through; NBR=Northbound right; SBL=Southbound left; SBT=Southbound through; SBR=Southbound right EBL=Eastbound left; EBT=Eastbound through; EBR=Eastbound right; WBL=Westbound left; WBT= Westbound through; WBR= Westbound right

Table 1-6. Horizon Year (2046) Build Condition Intersection Peak Hour Volumes

AM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	6	0	12	12	211	0	0	557	6
Birch Street & Markham Street	0	0	27	0	0	0	0	167	0	14	569	0
Cedar Street & Markham Street	5	0	18	0	0	0	0	138	41	5	543	0
Wood Road & Markham Street	65	300	25	7	205	50	61	60	17	96	397	39
PM Peak Hour												
Intersection	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**
Roosevelt Street & Markham Street	0	0	0	4	0	7	14	711	0	0	251	7
Birch Street & Markham Street	0	0	16	0	0	0	0	644	16	15	258	0
Cedar Street & Markham Street	0	0	23	0	0	0	0	599	0	8	244	0
Wood Road & Markham Street	54	305	69	9	231	24	65	580	31	29	160	4

Source: HDR 2022b
Note: NBL=Northbound left; NBT=Northbound through; NBR=Northbound right; SBL=Southbound left; SBT=Southbound through; SBR=Southbound right EBL=Eastbound left; EBT=Eastbound through; EBR=Eastbound right; WBL=Westbound left; WBT= Westbound through; WBR= Westbound right

1.3.4 Comparison of Existing/Baseline and Build Alternative

The comparison of the analysis results of the roadway segments and intersections that were studied in the TIA Memorandum and the Supplemental TIA Memorandum (HDR 2022a, HDR 2022b), under the No-Build and Build conditions, are presented in this section.

1.3.4.1 Capacity and Level of Service

Table 1-7 presents the volume to capacity (v/c) ratios and level of service (LOS) at all roadway segments under all No-Build and Build conditions. As shown in Table 1-7, all roadway segments operate at LOS B or better, with the exception of the following:

- Cajalco Road west of Wood Road with LOS E or F under all Build and No-Build conditions

The v/c ratio under the Build Alternative is lower than that under the No-Build Alternative at all the adjacent roadway segments of Markham Street. With the proposed Project in place, some traffic will be diverted to Markham Street from adjacent local streets, and traffic would be reduced on those adjacent local roads, such as Mariposa Avenue, Cajalco Road, and Wood Road. Therefore, the congested conditions on Cajalco Road, west of Wood Road, would be slightly alleviated with the implementation of the proposed Project.

Table 1-8 presents the study intersection peak hour LOS and average delays under No-Build and Build conditions. As shown in Table 1-8, all the study intersections operate at LOS D or better except for the intersection at Wood Road and Markham Street under the Horizon Year (2046) No-Build condition. The PM peak hour LOS is expected to be F under the Horizon Year (2046) No-Build condition. The intersection congestion is reduced with the implementation of the proposed Project. With the proposed improvement of an exclusive eastbound through-lane addition at the intersection, the intersection operates at LOS D under the Horizon Year (2046) Build condition.

Table 1-9 presents a summary comparison of the intersection queuing analysis at each of the study intersections under all No-Build and Build conditions. As shown in Table 1-9, adequate storage is provided for all intersections and movements under the Opening Year (2026) and Horizon Year (2046) Build conditions although the southbound through movement at the intersection of Wood Road and Markham Street would slightly block the upstream dirt road access during the PM peak hour under the Horizon Year (2046) No-Build condition.

1.3.4.2 Vehicle Miles Traveled

The traffic analysis in the Supplemental TIA Memorandum evaluated vehicle miles traveled (VMT) under the No-Build and Build conditions for the Horizon Year (2046) using VMT data from 2012 and 2040. Although the work based VMT under the Horizon Year (2046) Build condition is marginally higher than that under the Horizon Year (2046) No-Build condition, the corresponding residential VMT under the Horizon Year (2046) Build condition is reduced. As shown in Table 1-10, the combined residential and work VMT under the Build conditions are lower than that under the No-Build conditions.

Table 1-10 also illustrates average residential VMT per capita and average work VMT per employee under the Horizon Year (2046) Build and No-Build conditions. The average VMTs are based on the Countywide 1807 Traffic Analysis Zone (TAZ) within Riverside County. As shown in the table, the average VMTs remain the same under the Horizon Year (2046) Build and No-Build conditions. As shown in the table, no induced VMT occurs due to the proposed Project under years 2012, 2040, and 2046. It is anticipated that no induced VMT occurs due to the proposed Project under Horizon Year (2046). Therefore, no VMT mitigation is needed for this Project.

Additionally, VMT data from 2012 and 2040 were used to interpolate the combined VMT values under Opening Year (2026) conditions and are presented in Table 1-10. As shown in Table 1-10, the combined VMT for the Opening Year (2026) Build condition was lower than the Opening Year (2026) No-Build condition. It is anticipated that no induced VMT occurs due to the proposed Project under Opening Year (2026). Therefore, no VMT mitigation is needed for this Project. The VMT data is summarized in Appendix B.

Table 1-7. Roadway Segment Level of Service Comparisons

		Lane Configuration		Existing Year (2021) Condition		Opening Year (2026) No-Build Condition		Opening Year (2026) Build Condition		Horizon Year (2046) No-Build Condition		Horizon Year (2046) Build Condition	
Roadway Segment	**Location**	**Direction**	**Lanes**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**	**V/C**	**LOS**
Markham Street*	West of Roosevelt Street	E/W	3U/4U	0.009	A	0.010	A	0.169	A	0.018	A	0.284	A
Markham Street	Btw Roosevelt Street and Wood Road	E/W	2U	0.039	A	0.039	A	0.554	A	0.043	A	0.602	B
Markham Street	East of Wood Road	E/W	2U/3U	0.229	A	0.229	A	0.408	A	0.233	A	0.415	A
Roosevelt Street	North of Markham Street	N/S	2U	0.010	A	0.010	A	0.013	A	0.011	A	0.014	A
Wood Road	North of Markham Street	N/S	2U	0.486	A	0.490	A	0.371	A	0.519	A	0.393	A
Wood Road	South of Markham Street	N/S	2U/3U	0.513	A	0.523	A	0.460	A	0.588	A	0.517	A
Mariposa Avenue	Btw Roosevelt Street and Wood Road	E/W	2U	0.063	A	0.070	A	0.058	A	0.122	A	0.101	A
Cajalco Road**	Btw Harley John Road and Wood Road	E/W	2U/6U	1.142	F	1.362	F	1.324	F	0.944	E	0.918	E

Source: HDR 2022a
Note: N/S = Northbound/Southbound; E/W = Eastbound/Westbound; 2U = 2 Lane Undivided; 4U = 4 Lane Undivided; 3U = 3 Lane Undivided; ADT = Average Daily Traffic Volume; V/C = Volume-to-Capacity Ratio; LOS = Level of Service
* Use the average of service level ADT data criteria for Collector and Secondary roadways shown in Appendix D of County of Riverside Transportation Analysis Guidelines for Level of Service Vehicle Miles Traveled, Dec 2020.
** Cajalco Road is a two-lane arterial under the existing 2021 and future year 2026 conditions; Cajalco Road is projected to be a six-lane Expressway under the future year 2046 conditions.

Table 1-8. Intersection Peak-Hour Level of Service Comparisons

		Existing Year (2021) Condition				Opening Year 2026 No-Build Condition				Opening Year 2026 Build Condition				Horizon Year (2046) No-Build Condition				Horizon Year (2046) Build Condition			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
Intersection	**Traffic Control**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
Roosevelt Street and Markham Street	AWSC/TWSC*	6.9	A	7.0	A	6.9	A	7.0	A	11.0	B	10.6	B	6.9	A	7.0	A	11.3	B	11.2	B
Birch Street and Markham Street	TWSC	8.4	A	8.4	A	8.4	A	8.4	A	9.1	A	12.3	B	8.4	A	8.4	A	9.2	A	12.9	B
Cedar Street and Markham Street	TWSC	8.5	A	8.4	A	8.5	A	8.4	A	10.1	B	11.9	B	8.5	A	8.4	A	10.3	B	12.5	B
Wood Road and Markham Street	Traffic Signal	41.4	D	48.3	D	42.2	D	51	D	38.4	D	36.1	D	52.5	D	80.3	F	40.0	D	37.3	D

Source: HDR 2022a
Note: AWSC=All Way Stop-Controlled; TWSC=Two Way Stop-Controlled;
For two-way stop-controlled intersections, the worst stop-controlled approach or movement results were listed in the table.
* AWSC/TWSC - The intersection is an AWSC or a TWSC under the existing and future no build conditions or future build conditions, respectively.

Table 1-9. Intersection Peak Hour Queuing Comparison

		Existing Year (2021) Condition		Opening Year (2026) No-Build Condition		Opening Year (2026) Build Condition		Horizon Year (2046) No-Build Condition		Horizon Year (2046) Build Condition	
		AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
Intersection (NB/SB & EB/WB)	Movement	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)
Roosevelt Street & Markham Street	SB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	EB*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	WB*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Birch Street & Markham Street	NB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	WB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cedar Street & Markham Street	NB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	WB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wood Road & Markham Street	NBL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	NBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	NBR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	SBL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	SBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
	EBL	--	--	--	--	Yes	Yes	--	--	Yes	Yes
	EBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	WBL*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	WBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: HDR 2022a
Note: EB=Eastbound; EBL= Eastbound left; EBT=Eastbound through; EB/WB=Eastbound/Westbound; NB =Northbound; NBL= Northbound left; NBR= Northbound right; NBT=Northbound through; NB/SB=Northbound/Southbound; SB= Southbound; SBL= Southbound left; SBT=Southbound through WB=Westbound; WBL=Westbound left; WBT=Westbound through
* The turn pocket extends into a two-way left turn lane; -- Not Applicable

Table 1-10. Vehicle Miles Traveled Results Summary

							Horizon Year (2046)			Opening Year (2026)		
VMT Comparison	Existing Year (2021) No-Build Condition	Existing Year (2021) Build Condition	Existing Year (2021) Build Condition vs Existing Year (2021) No-Build Condition	Year 2040 No-Build Condition	Year 2040 Build Condition	2040 Build Condition vs 2040 No-Build Condition	Horizon Year (2046) No-Build Condition	Horizon Year (2046) Build Condition	Horizon Year (2046) Build Condition vs Horizon Year (2046) No-Build Condition	Opening Year (2026) No-Build Condition[1]	Opening Year (2026) Build Condition[1]	Opening Year (2026) Build Condition vs Horizon Year (2026) No-Build Condition
Total Residential VMT	32,037,483	32,030,136	-0.023%	49,805,138	49,802,159	-0.006%	55,724,012	55,722,286	-0.003%	--	--	--
Total Work VMT	8,111,059	8,110,938	-0.001%	16,700,356	16,700,813	0.003%	20,490,006	20,490,033	0.000%	--	--	--
Total VMT	***40,148,542***	***40,141,074***	***-0.019%***	***66,505,494***	***66,502,972***	***-0.004%***	**76,214,018**	**76,212,319**	**-0.002%**	**53,327,018**	**53,322,023**	**-0.009%**
Average Residential VMT/Capita	16.5	16.5	0.000%	20.0	20.0	0.000%	21.0	21.0	0.000%	--	--	--
Average Work VMT/Employee	10.8	10.8	0.000%	12.1	12.1	0.000%	12.0	12.0	0.000%	--	--	--

Source: HDR 2022a, HDR 2022b
Notes: VMT=vehicle miles traveled; -- Not Applicable
[1]Values for Opening Year 2026 were interpolated using 2012 and 2040 VMT data.

1.4 Construction Activities and Schedule

Under the Build Alternative (proposed Project), construction activities (e.g., clearing and grubbing, roadway excavation, utility construction, etc.) are anticipated to commence in the first quarter of 2026 and be completed by the third quarter of 2026. Construction is planned to last approximately 6 months; therefore, no construction activities are anticipated to last more than 5 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. A summary of construction assumptions is provided below in Table 1-11, Table 1-12 and Table 1-13.

Table 1-11. General Construction Inputs

Parameter	Assumption
Construction Start Year	2026
Construction Duration	6 months
Project Length	1.3 miles
Project Area	13.3 acres
Maximum Area Disturbed Per Day	2.0 acres

Table 1-12. General Phasing Assumptions

Phase	Weeks	Import (Cubic Yards)	Export (Cubic Yards)	Daily Haul Trips	Daily Vendor Truck Trips	Daily Employee Trips	Daily Water Trucks
Clearing and Grubbing	2	-	-	8	-	14	3
Asphalt Demolition	1	-	870	18	-	10	3
Roadway Excavation	4	-	-	-	-	30	3
Imported Borrow	4	26,260	-	132	-	26	3
Utility Construction	8	-	-	4	4	14	3
Flatwork	4	-	-	8	12	6	3
Aggregate Base	3	-	-	24	-	18	3
Asphalt Paving	2	-	-	-	24	18	3
Source: Modeling data provided in Appendix A.							

Table 1-13. Off-Road Equipment Inventory

Phase	Equipment	Quantity per Day	Daily Usage (hours)
Clearing and Grubbing	Rubber Tired Dozers	1	8
	Excavators	1	8
	Tractors/Loaders/Backhoes	1	8
	Other Construction Equipment	1	8
	Sweepers/Scrubbers	1	8
Asphalt Demolition	Rubber Tired Dozers	1	8
	Excavators	1	8
	Tractors/Loaders/Backhoes	1	8
	Sweepers/Scrubbers	1	8
Roadway Excavation	Rubber Tired Dozers	1	8
	Excavators	1	8
	Scrapers	2	8
	Graders	1	8
	Sweepers/Scrubbers	1	8
	Rollers	2	8
Imported Borrow	Scrapers	2	8
	Graders	1	8
	Sweepers/Scrubbers	1	8
	Rollers	2	8
Utility Construction	Excavators	1	8
	Tractors/Loaders/Backhoes	1	8
	Sweepers/Scrubbers	1	8
	Cranes	1	8
	Rough Terrain Forklifts	1	8
Flatwork	Tractors/Loaders/Backhoes	1	8
	Rough Terrain Forklifts	1	8
Aggregate Base	Tractors/Loaders/Backhoes	1	8
	Graders	1	8
	Sweepers/Scrubbers	1	8
	Rollers	2	8
Asphalt Paving	Tractors/Loaders/Backhoes	1	8
	Sweepers/Scrubbers	1	8
	Rollers	2	8
	Pavers	1	8
Source: Modeling data provided in Appendix A.			

Chapter 2 Regulatory Setting

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

2.1 Pollutant-Specific Overview

Air pollutants are governed by multiple federal and state standards that 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 (i.e., particulate matter 2.5 microns or less in diameter [$PM_{2.5}$] and particulate matter 10 microns or less in diameter [PM_{10}]), and sulfur dioxide (SO_2). The U.S. Environmental Protection Agency (U.S. EPA) has also identified nine priority mobile-source air toxics (MSATs): 1,3-butadiene, acetaldehyde, acrolein, benzene, diesel particulate matter (DPM), ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter (FHWA 2016). In California, sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride are also regulated.

2.1.1 Criteria Pollutants

The Clean Air Act (CAA) requires U.S. EPA to set NAAQS for six criteria air contaminants: O_3, PM, CO, NO_2, Pb, 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, summarizes the sources and health effects of the criteria pollutants, and documents the Project area attainment status with the standards.

Table 2-1. Table of State and Federal Ambient Air Quality Standards, Effects, and Sources

Pollutant	Averaging Time	State[a] Standard	Federal[b] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Ozone (O_3)[c]	1 hour	0.09 ppm[d]	—	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 volatile organic compounds (VOC) may also contribute.	Low-altitude ozone is formed almost entirely from reactive organic gases (ROGs)/VOCs as well as nitrogen oxide (NO_X) in the presence of sunlight and heat. Common precursor emitters include motor vehicle and other internal combustion engines, solvent evaporation, boilers, furnaces, and industrial processes.	Nonattainment	—
	8 hours	0.070 ppm	0.070 ppm (fourth highest in three years)			Nonattainment	Extreme Nonattainment
Carbon Monoxide (CO)[e]	1 hour	20 ppm	35 ppm	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO, which is colorless and odorless, also is a minor precursor for photochemical ozone.	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.	Attainment	Maintenance
	8 hours	9.0 ppm	9 ppm			Attainment	Maintenance
	8 hours (Lake Tahoe)	6 ppm	—			—	—
Respirable Particulate Matter (PM_{10})[f]	24 hours	50 µg/m^3[i]	150 µg/m^3 (expected number of days above standard less than or equal to one)	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer risk and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many toxic and aerosol and solid compounds are part of PM_{10}.	Dust- and fume-producing industrial and agricultural operations, combustion smoke and vehicle exhaust, atmospheric chemical reactions, construction and other dust-producing activities, unpaved road dust and re-entrained paved road dust, natural sources.	Nonattainment	Serious Maintenance
	Annual	20 µg/m^3	—[f]			Nonattainment	—

Pollutant	Averaging Time	State[a] Standard	Federal[b] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Fine Particulate Matter ($PM_{2.5}$)[h]	24 hours	—	35 µg/m^3[g]	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 aerosol and solid compounds are part of $PM_{2.5}$.	Combustion, including motor vehicles, other mobile sources, and industrial activities, and residential and agricultural burning. Also formed through atmospheric chemical and photochemical reactions involving other pollutants, including NO_X, sulfur oxide (SO_X), ammonia, and ROG.	—	Serious Nonattainment
	Annual	12 µg/m^3	12.0 µg/m^3			Nonattainment	Moderate Nonattainment
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm[i]	Irritating to eyes and respiratory tract. Colors atmosphere reddish brown. Contributes to acid rain and nitrate contamination of stormwater. Part of the NO_X group of ozone precursors.	Motor vehicle engines and other mobile or portable engines, especially diesel; refineries; industrial operations.	Attainment	Attainment
	Annual	0.030 ppm	0.053 ppm			Attainment	Attainment
Sulfur Dioxide (SO_2)[j]	1 hour	0.25 ppm	0.075 ppm (99th percentile over three years)	Irritates respiratory tract and injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, and steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing, and some natural sources, such as active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	Attainment	Attainment
	3 hours	—	0.5 ppm[k]			—	Attainment
	24 hours	0.04 ppm	0.14 ppm (for certain areas)			Attainment	Attainment
	Annual	—	0.030 ppm (for certain areas)			—	Attainment
Lead (Pb)[l]	Monthly	1.5 µg/m^3	—			Attainment	—
	Calendar quarter	—	1.5 µg/m^3 (for certain areas)			—	Attainment

Pollutant	Averaging Time	State[a] Standard	Federal[b] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
	Rolling three-month average	—	0.15 μg/m[3m]	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes, such as battery production facilities and smelters; lead paint; and leaded gasoline. Aerially deposited lead from older gasoline use may exist in soil along major roads.	—	Attainment
Sulfates	24 hours	25 μg/m³	—	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, such as volcanic areas; salt-covered dry lakes; and large sulfide rock areas.	Attainment	N/A
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	—	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, such as volcanic areas and hot springs.	Attainment	N/A
Visibility-Reducing Particles (VRP)[n]	8 hours	Visibility of 10 miles or more (Tahoe: 30 miles) at relative humidity less than 70%	—	Reduces visibility. Produces haze. Note: Not directly related to the regional haze program under the federal CAA, 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.	Attainment	N/A

Pollutant	Averaging Time	State[a] Standard	Federal[b] Standard	Principal Health and Atmospheric Effects	Typical Sources	State Project Area Attainment Status	Federal Project Area Attainment Status
Vinyl Chloride[12]	24 hours	0.01 ppm	—	Neurological effects, liver damage, cancer. Also considered a toxic air contaminant.	Industrial processes	Attainment	N/A

Source: CARB 2022a; U.S. EPA 2022

Standards adapted from the California Air Resources Board (CARB) air quality standards chart (http://www.arb.ca.gov/research/aaqs/aaqs2.pdf).

[1] California standards for ozone, carbon monoxide (except eight-hour Lake Tahoe standard), sulfur dioxide (one- and 24-hour standard), nitrogen dioxide, and particulate matter (PM_{10}, $PM_{2.5}$, 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] Federal 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 eight-hour concentration measured at each site in a year, averaged over three years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 micrograms per cubic meter ($\mu g/m^3$) is equal to or less than one. For $PM_{2.5}$, 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] On October 1, 2015, the national eight-hour ozone primary and secondary standards were lowered from 0.075 to 0.070 part per million. Transportation conformity applies in newly designated nonattainment areas for the 2015 national eight-hour ozone primary and secondary standards on and after August 4, 2019 (see Transportation Conformity Guidance for 2015 Ozone NAAQS Nonattainment Areas).

[4] ppm = parts per million.

[5] Transportation conformity requirements for carbon monoxide no longer apply after June 1, 2018, for the California carbon monoxide maintenance areas (see U.S. EPA CO Maintenance Letter).

[6] On December 14, 2012, the national annual $PM_{2.5}$ primary standard was lowered from 15 $\mu g/m^3$ to 12 $\mu g/m^3$. The existing national 24-hour $PM_{2.5}$ 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 PM_{10} 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 three years.

[7] $\mu g/m^3$ = micrograms per cubic meter.

[8] The 65 $\mu g/m^3$ $PM_{2.5}$ (24-hour) NAAQS was not revoked when the 35 $\mu g/m^3$ NAAQS was promulgated in 2006. The 15 $\mu g/m^3$ annual $PM_{2.5}$ standard was not revoked when the 12 $\mu g/m^3$ standard was promulgated in 2012. Therefore, for areas designated nonattainment or nonattainment/maintenance for the 1997 and/or 2006 $PM_{2.5}$ NAAQS conformity requirements still apply until the NAAQS are fully revoked.

[9] Final 1-hour NO_2 NAAQS published in the *Federal Register* on February 9, 2010, effective March 9, 2010. Initial area designation for California (2012) was attainment/unclassifiable throughout. Project-level hot-spot analysis requirements do not currently exist. Near-road monitoring starting in 2013 may cause re-designation to nonattainment in some areas after 2016.

[10] 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 part per billion. The 1971 SO_2 national standards (24-hour and annual standards) remain in effect until 1 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.

[11] Secondary standard, the levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant rather than health. Conformity and environmental analysis address both primary and secondary NAAQS.

[12] CARB has identified vinyl chloride and the particulate matter fraction of diesel exhaust as toxic air contaminants. Diesel exhaust particulate matter is part of PM_{10} and, in larger proportion, $PM_{2.5}$. Both CARB and U.S. EPA have identified lead and various organic compounds that are precursors to ozone and $PM_{2.5}$ as toxic air contaminants. There are no exposure criteria for adverse health effect due to toxic air contaminants, and control requirements may apply at ambient concentrations below any criteria levels specified above for these pollutants or the general categories of pollutants to which they belong.

[13] Lead NAAQS are not considered in transportation conformity analysis.

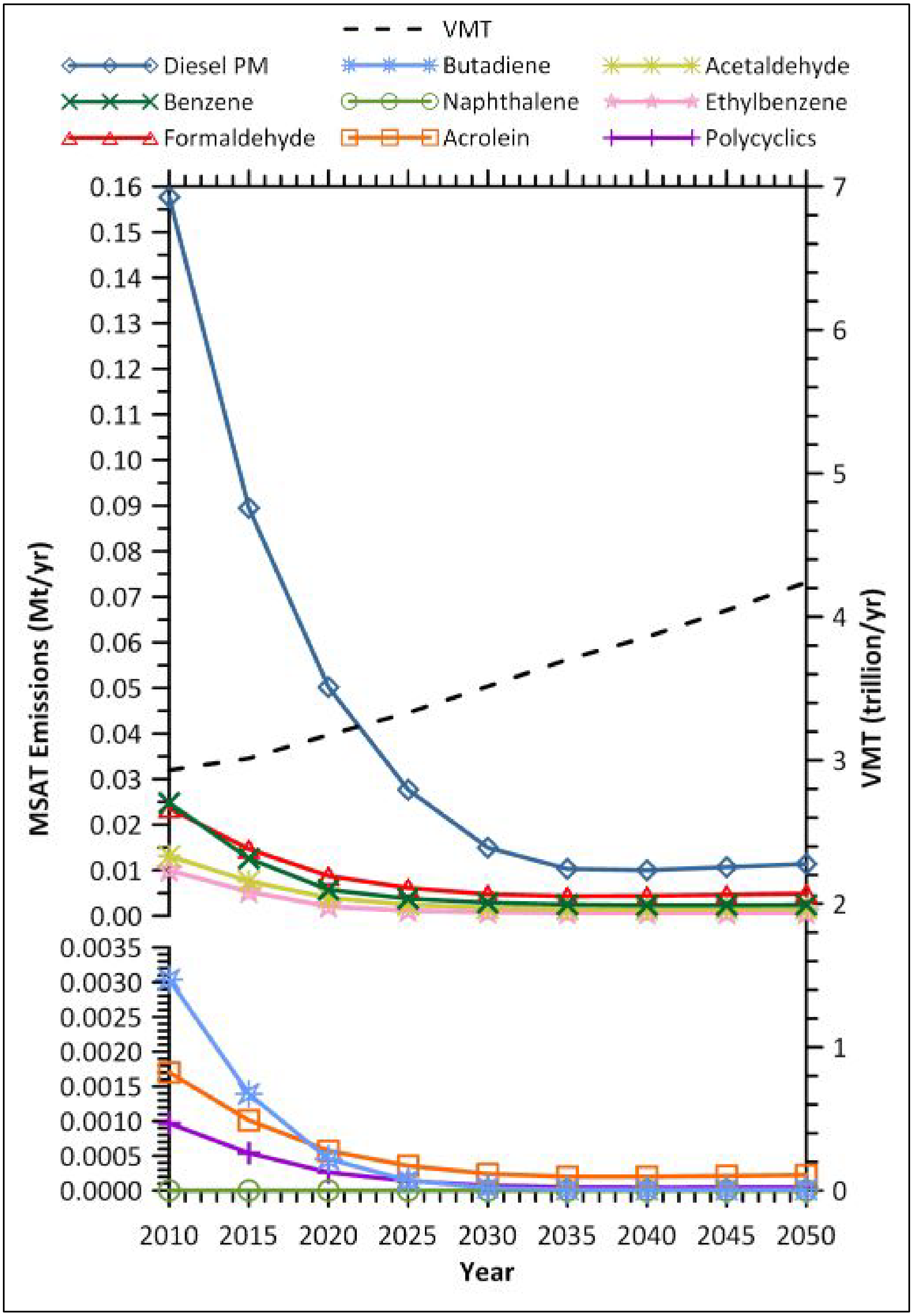
[14] In 1989, CARB converted both the general statewide 10-mile visibility standard and the Lake Tahoe 30-mile visibility standard to instrumental equivalents, which are “extinction of 0.23 per kilometer” and “extinction of 0.07 per kilometer” for the statewide and Lake Tahoe Air Basin standards, respectively.

2.1.2 Mobile-Source Air Toxics

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that U.S. EPA regulate 188 air toxics, also known as hazardous air pollutants. U.S. EPA assessed this expansive list in its rule on the control of hazardous air pollutants from mobile sources (*Federal Register*, Volume 72, No. 37, page 8430, February 26, 2007), and identified a group of 93 compounds emitted from mobile sources that are part of the agency's Integrated Risk Information System (https://www.epa.gov/iris) (U.S. EPA 2019). In addition, U.S. EPA identified nine compounds with significant contributions from mobile sources that are among the national and regional cancer risk drivers or contributors as well as non-hazard contributors from the National Air Toxics Assessment (https://www.epa.gov/ national-air-toxics-assessment) (U.S. EPA 2018). These are 1,3-butadiene, acetaldehyde, acrolein, benzene, DPM, ethylbenzene, formaldehyde, naphthalene, and polycyclic organic matter. Although the Federal Highway Administration (FHWA) considers these priority MSATs, 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 to decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using U.S. EPA's MOVES2014 model, even if VMT increases by 45 percent from 2010 to 2050, as forecast, a combined reduction of 91 percent in the total annual emission rate for priority MSATs is projected for the same time period, as shown on Figure 2-1.

Figure 2-1. Projected National Mobile Source Air Toxic Trends, 2010–2050



Source: FHWA 2016

2.1.3 Greenhouse Gases

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

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

As evidence mounted for the relationship of climate changes to rising GHGs, federal and state governments established numerous policies and goals to improve energy efficiency and fuel economy and reduce 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.

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 issued the first corporate fuel economy 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 (CARB) to develop a scoping plan that describes the approach California will take to achieve that goal and update it every 5 years. In 2015, Governor Jerry Brown enhanced the overall adaptation planning effort with Executive Order B-30-15,

[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, UK, and New York, NY, USA. See 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.

establishing an interim GHG reduction goal of 40 percent below 1990 levels by 2030 and required state agencies to factor climate change into all planning and investment decisions.

Senate Bill (SB) 375, the Sustainable Communities and Climate Protection Act of 2008, furthered state climate action goals by mandating coordinated transportation and land use planning through the preparation of Sustainability Communities Strategies (SCS). CARB sets GHG emissions reduction targets for passenger vehicles in each region. Each regional Metropolitan Planning Organization (MPO) must include in its Regional Transportation Plan (RTP) an SCS proposing actions toward achieving the regional emissions reduction targets (CARB 2020).

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 (TAC) by CARB 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, which is closely related to serpentinite, may also contain asbestos minerals. Asbestos can also be associated with other rock types in California, although much less frequently than serpentinite or ultramafic rock, which are known to be present in 44 of California's 58 counties. These rocks are particularly abundant in the Sierra Nevada foothills, Klamath Mountains, and Coast Ranges. The California Department of Conservation, Division of Mines and Geology, has developed a map that shows the general locations of ultramafic rock in the state (www.conservation.ca.gov/cgs/minerals/hazardous_minerals/asbestos/Pages/index.aspx).

2.2 Regulations

2.2.1 Federal and California Clean Air Act

The Federal CAA, as amended, is the primary federal law that governs air quality while the California CAA is its companion state law. These laws and related regulations adopted by U.S. EPA and CARB set standards for the concentration of pollutants in the air. At the federal level, these standards are called the 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 Pb, and state standards exist for visibility-reducing particles, sulfates, hydrogen sulfide, 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 TACs (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

2.2.2 Transportation Conformity

The conformity requirement is based on Federal Clean Air Act Section 176(c), which prohibits the U.S. Department of Transportation 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 would not be federally funded and the County would be the CEQA lead agency, therefore, it would not be subject to comply with requirements of a National Environmental Policy Act (NEPA) analysis or standard conformity requirements, such as regional conformity.

2.2.3 California Environmental Quality Act

The California Environmental Quality Act (CEQA)[3] is a statute that requires state and local agencies to identify the significant environmental impacts of their actions and avoid or mitigate those impacts, if feasible. CEQA documents must address California CAA requirements for transportation projects. Although state standards are often stricter than federal standards, the state has no conformity process.

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

2.2.4 Local

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

2.2.4.1 South Coast Air Quality Management District

The 1977 Lewis Air Quality Management Act created the South Coast Air Quality Management District (SCAQMD) to coordinate air quality planning efforts throughout Southern California. This act merged four county air pollution control agencies into one regional district to address the issue of improving air quality in Southern California. Under the act, renamed the Lewis-Presley Air Quality Management Act in 1988, SCAQMD is the principal agency responsible for comprehensive air pollution control in the region. Specifically, SCAQMD is responsible for monitoring air quality as well as planning, implementing, and enforcing programs to attain and maintain state and federal ambient air quality standards in the district. These programs include air quality rules that regulate stationary sources, area sources, point sources, and certain mobile-source emissions. SCAQMD is also responsible for establishing stationary-source permitting requirements and ensuring that new, modified, or relocated stationary sources do not create net emission increases.

Air Quality Management Plan

The CAA requires areas not attaining the National Ambient Air Quality Standards (NAAQS) to develop and implement an emission reduction strategy that will bring the area into attainment in a timely manner. The Air Quality Management Plan (AQMP) is the SCAQMD plan for improving regional air quality. It addresses CAA requirements and demonstrates attainment with state and federal ambient air quality standards. The AQMP is prepared by SCAQMD in collaboration with SCAG and CARB. The AQMP provides policies and control measures that reduce emissions to attain both state and federal ambient air quality standards by their applicable deadlines. Environmental review of individual projects within the South Coast Air Basin (SCAB) must demonstrate that daily construction and operational emissions thresholds, as established by SCAQMD, would not be exceeded. The environmental review must also demonstrate that individual projects would not increase the number or severity of existing air quality violations.

At the time of writing this report, the 2016 AQMP was the current AQMP, which was adopted by the SCAQMD Governing Board on March 3, 2017. It incorporates the latest scientific and technological information and planning assumptions, including the 2016 RTP/SCS and updated emission inventory methodologies for various source categories. The 2016 AQMP includes the integrated strategies and measures needed to meet the ozone and $PM_{2.5}$ NAAQS.

To ensure air quality goals will be met while maximizing benefits and minimizing adverse impacts on the regional economy, the following policy objectives guided development of the 2016 AQMP:

- Eliminate reliance on future technology (CAA Section 182(e)(5)) measures to the maximum extent feasible.
- Calculate and take credit for co-benefits from other planning efforts.
- Develop a strategy with fair-share emission reductions at the federal, state, and local levels.
- Invest in strategies and technologies that meet multiple objectives regarding air quality, climate change, air toxics exposure, energy, and transportation.
- Identify and secure significant funding for incentives to implement early deployment and commercialization of zero and near-zero technologies.
- Enhance the socioeconomic analysis and pursue the most efficient and cost-effective path to achieve multi-pollutant and multi-deadline targets.
- Prioritize enforceable regulatory measures as well as non-regulatory, innovative, and "win-win" approaches for emission reductions.

The 2022 AQMP was recently adopted in December 2022 and represents a comprehensive analysis of emissions, meteorology, regional air quality modeling, and regional growth projections for the SCAB. The 2022 AQMP will also build on the 2016 AQMP's control measures and develop additional measures to meet the 2015 8-hour ozone NAAQS.

The Project is also required to comply with all applicable SCAQMD Rules and Regulations pertaining to construction activities, including, but not limited to:

- Rule 401– Visible Emissions. This rule prohibits the discharge into the atmosphere from any single source of emission whatsoever any air contaminant for a period or periods aggregating more than three minutes in any 1 hour that is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

- Rule 402– Nuisance. This rule prohibits the discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; endanger the comfort, repose, health, or safety of any such persons or the public; or cause, or have a natural tendency to cause, injury or damage to business or property. Odors are regulated under this rule.

- Rule 403 – Fugitive Dust. This rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remains visible beyond the property line of the emission's source. During construction, best available control measures identified in the rule would be required to minimize fugitive dust emissions from proposed earthmoving and grading activities. These measures would include site pre-watering and re-watering as necessary to maintain sufficient soil moisture content. Additional requirements apply to construction projects on properties with 50 or more acres of disturbed surface area or any earthmoving operation with a daily earthmoving or throughput volume of 5,000 cubic yards or more three times during the most recent 365-day period. These requirements include submittal of a dust control plan, maintenance of dust control records, and designation of an SCAQMD-certified dust control supervisor.

- Rule 1108 – Cutback Asphalt. This rule specifies VOC content limits for cutback asphalt.

- Rule 1113 – Architectural Coatings. This rule limits the VOC content in architectural coatings used in the SCAQMD jurisdiction. These limits are application-specific and are updated as availability of low-VOC products expands.

Chapter 3 Affected Environment

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

The Project area is within the Woodcrest community in Riverside County, an area within the SCAB, which includes all of Orange County and a portion of Los Angeles, San Bernardino, and Riverside Counties. Air quality regulation in the SCAB is administered by SCAQMD. Population for Riverside County in 2021 was approximately 2,418,185 and is projected to exceed 3.2 million by 2045 (U.S. Census Bureau 2022, SCAG 2020). Based on data for the Riverside-San Bernardino-Ontario Metropolitan Statistical Area (Riverside and San Bernardino Counties), the economy is largely driven by the following industry sectors: Trade, Transportation, & Utilities, Educational & Health Services, and Government (California Employment Development Department 2023).

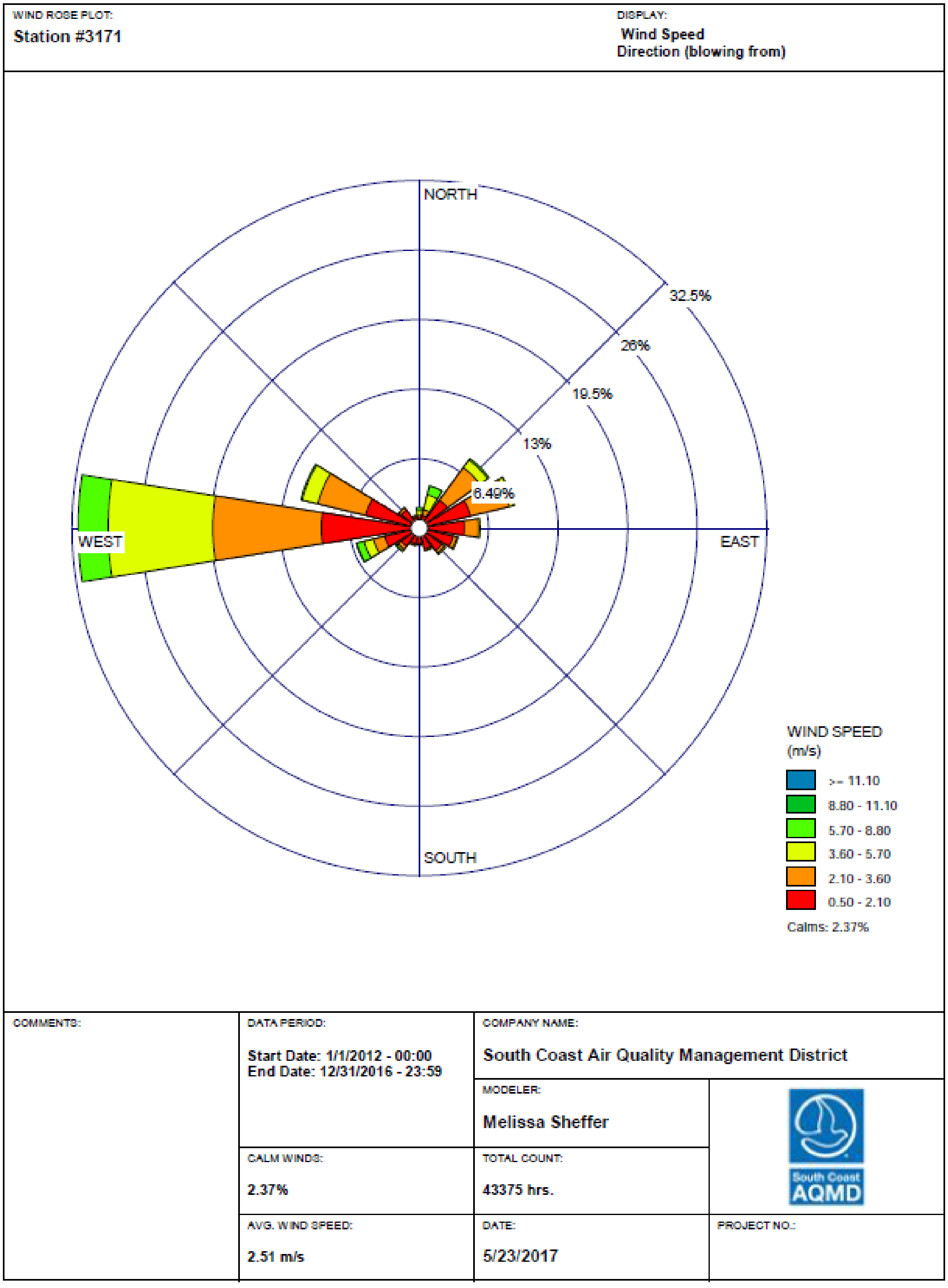
3.1 Climate, Meteorology, and Topography

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 O_3 and O_3 precursors from one region to another, contributing to air quality problems downwind of source regions. Furthermore, mountains can act as barriers that prevent O_3 from dispersing.

The SCAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountains around the rest of its perimeter. During the spring and early summer, pollution is typically blown out of the SCAB through mountain passes or lifted by warm, vertical currents adjacent to mountain slopes. The vertical dispersion of air pollutants in the SCAB is limited by temperature inversions in the atmosphere close to Earth's surface. The combination of stagnant wind conditions and low inversions produces the greatest pollutant concentrations. On days with no inversion or high wind speeds, ambient air pollutant concentrations are lowest. During periods with low inversions and low wind speeds, air pollutants become more concentrated in urbanized areas with pollution sources of great magnitude.

The Riverside Airport climatological station, maintained by SCAQMD, is the closest station to the Project area and representative of meteorological conditions near the proposed Project. Figure 3-1 shows a wind rose, illustrating the predominant wind patterns near the Project. The average high and low temperatures are 82 degrees Fahrenheit (July) and 57 degrees Fahrenheit (January), respectively (SCAQMD 2017). The average annual precipitation for the area is 10.21 inches (WRCC 2022).

Figure 3-1. Predominant Wind Patterns near the Project Area



Source: SCAQMD 2017

The SCAB experiences frequent temperature inversions. Atmospheric temperature typically decreases with height. However, under inversion conditions, temperature increases as altitude increases, thereby preventing air close to the ground from mixing with the air above it. As a result, air pollutants are trapped near the ground. During the summer, air quality problems are created because of the interaction between the ocean surface and the lower layer of the atmosphere. This interaction creates a moist marine layer. An upper layer of warm air forms over the cool marine layer, preventing air pollutants from dispersing upward (SCAQMD 1993).

3.2 Existing Air Quality

This section summarizes existing air quality conditions near the Project area. The section identifies attainment statuses for criteria pollutants, describes local ambient concentrations of criteria pollutants for the past 3 years, and discusses MSAT and GHG emissions. The nearest air quality monitoring station is SCAQMD's Perris Valley Station located approximately 8 miles southwest of the Project area. The Perris Valley Station only monitors for O_3 and PM_{10}. The next closest monitoring station is the Mission Boulevard Station in Rubidoux (Riverside-Rubidoux), which is roughly 11 miles northwest of the Project. The Riverside-Rubidoux monitoring station has data for CO, NO_2, and $PM_{2.5}$.

3.2.1 Criteria Pollutants and Attainment Status

Table 2-1 in Section 2.1.1, *Criteria Pollutants*, lists the state and federal attainment status in Riverside County for all regulated pollutants. Riverside County is classified as an extreme nonattainment area for the federal 8-hour O_3 standard, a serious nonattainment area for the federal $PM_{2.5}$ standard, and a serious maintenance area for the federal CO standard. Riverside County is classified as a nonattainment area for the state O_3, PM_{10}, and $PM_{2.5}$ standards.

Table 3-1 and Table 3-2 lists air quality trends in data collected at the Perris Valley and Riverside-Rubidoux monitoring stations for the past 3 years where data is available. These stations are representative of the Project area because the climate, topography, and urban setting are like those of the Project area. During the 2018 to 2020 monitoring period, exceedances were recorded at the monitoring stations for the state 1-hour O_3 standard, state and federal 8-hour O_3 standards, PM_{10} and $PM_{2.5}$ standards.

3.2.2 Mobile Source Air Toxics

The most prominent sources of MSAT pollutants in the Project area are vehicles that use local and regional roadways in the area, including Markham Street. Of the vehicles operating in the Project area, those that are diesel powered are the largest source of MSAT emissions. No major rail yards, transit terminals, large warehouses, or distribution centers are located near the Project area.

Table 3-1. Criteria Pollutant Concentrations for the Past 3 Years Measured at the Perris Valley Monitoring Station

Pollutant	Standard	2018	2019	2020
Ozone				
Maximum 1-hour concentration		0.117	0.118	0.125
Number of days exceeded: State	0.09 ppm	31	26	34
Maximum 8-hour concentration		0.103	0.095	0.106
Number of days exceeded: State	0.070 ppm	31	64	74
Number of days exceeded: Federal	0.070 ppm	31	64	74
PM_{10}				
Maximum 24-hour concentration		64	97	77
Number of days exceeded: State	50 μg/m^3	3	4	6
Number of days exceeded: Federal	150 μg/m^3	0	0	0
Maximum annual concentration		29.7	25.3	35.9
Exceeded: State	20 μg/m^3	Yes	Yes	Yes

Source: SCAQMD 2022
μg/m^3 = micrograms per cubic meter; $PM_{2.5}$ = fine particulate matter; PM_{10} = suspended particulate matter; ppb = parts per billion; ppm = parts per million.

Table 3-2. Criteria Pollutant Concentrations for the Past 3 Years Measured at the Riverside-Rubidoux Monitoring Station

Pollutant	Standard	2018	2019	2020
Carbon Monoxide				
Maximum 1-hour concentration		2.2	1.5	1.9
Number of days exceeded: State	20 ppm	0	0	0
Number of days exceeded: Federal	35 ppm	0	0	0
Maximum 8-hour concentration		2.0	1.2	1.4
Number of days exceeded: State	9.0 ppm	0	0	0
Number of days exceeded: Federal	9 ppm	0	0	0
$PM_{2.5}$				
Maximum 24-hour concentration		50.7	46.7	41
Number of days exceeded: Federal	35 μg/m^3	2	4	4
Maximum annual concentration		12.4	11.1	12.6
Exceeded: State	12 μg/m^3	Yes	No	Yes
Exceeded: Federal	12.0 μg/m^3	Yes	No	Yes
Nitrogen Dioxide				
Maximum 1-hour concentration		0.055 ppm	0.056 ppm	0.066 ppm
Number of days exceeded: State	0.18 ppm	0	0	0
Number of days exceeded: Federal	100 ppb	0	0	0
Maximum annual concentration		0.0143 ppm	0.0135 ppm	0.0136 ppm
Exceeded: State	0.030 ppm	No	No	No
Exceeded: Federal	53 ppb	No	No	No

Source: SCAQMD 2022
μg/m^3 = micrograms per cubic meter; $PM_{2.5}$ = fine particulate matter; PM_{10} = suspended particulate matter; ppb = parts per billion; ppm = parts per million.

3.2.3 Greenhouse Gas and Climate Change

The principle anthropogenic (human-made) GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated compounds, including sulfur hexafluoride, hydrofluorocarbons (HFCs), and perfluorocarbons. The primary GHGs that would be emitted by Project-related construction and operations include CO_2, CH_4, and N_2O. The principal characteristics of these pollutants are discussed below.

Carbon dioxide enters the atmosphere through the combustion of fossil fuel (i.e., oil, natural gas, coal), solid waste decomposition, plant and animal respiration, and chemical reactions (e.g., from manufacturing cement). CO_2 is also removed from the atmosphere, or sequestered, when it is absorbed by plants as part of the biological carbon cycle.

Methane is emitted during the production and transport of coal, natural gas, and oil. CH_4 emissions also result from livestock and agricultural practices as well as the anaerobic decay of organic waste in municipal solid waste landfills.

Nitrous oxide is emitted by agricultural and industrial activities as well as the combustion of fossil fuels and solid waste.

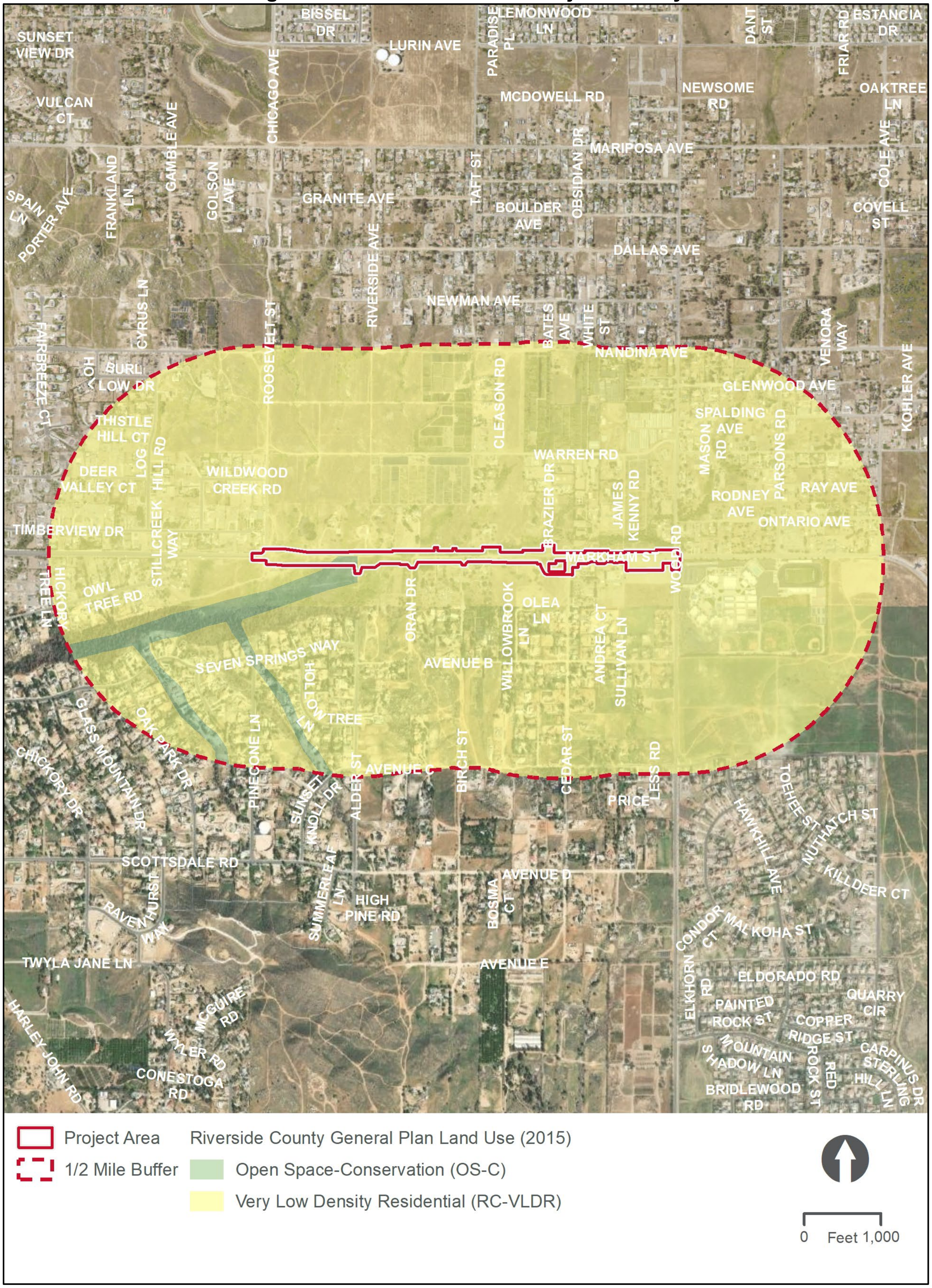
Methods have been set forth to describe emissions of GHGs in terms of a single gas to simplify reporting and analysis. The most commonly accepted method for comparing GHG emissions is the global warming potential (GWP) methodology defined in the Intergovernmental Panel on Climate Change (IPCC) reference documents. IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of carbon dioxide equivalent (CO_2e), which compares the gas in question to that of the same mass of CO_2. By definition, CO_2 has a GWP of 1.

CARB prepares an annual GHG inventory to track the state's progress in reducing GHG emissions. In 2019, California emitted a total of 418.2 million metric tons of CO_2e (CARB 2022b). According to CARB, the largest contributors were the transportation and industrial sectors, contributing 41 percent and 24 percent of the total annual emissions, respectively.

3.3 Sensitive Receptors

Given the size of the Project area and the Project's potential to influence receptors at great distances from the Project area, sensitive receptors within 2,000 feet of the Project area have been identified, as documented in Figure 3-2. SCAQMD (1993) defines sensitive receptors as people who have increased sensitivity to air pollution. Sensitive receptors include schools, athletic fields, playgrounds, childcare centers, convalescent centers, retirement homes, hospitals, and residential areas. Sensitive land uses within 2,000 feet of the Project area include residences and a high school; the closest receptors to the Project area are existing residences located adjacent to the Project area. The Riverside County General Plan land use designations within and surrounding the Project Area are shown in Figure 3-2.

Figure 3-2. Land Uses in the Project Vicinity



3.4 Conformity Status

As discussed in Section 2.2.2, the proposed Project would not be federally funded and would not be required to conduct a regional or project-level conformity analysis.

3.5 NEPA Analysis/Requirement

NEPA applies to all projects that receive federal funding or involve a federal action. NEPA requires all reasonable alternatives to the project to be rigorously explored and objectively evaluated. For NEPA analyses, criteria pollutants, MSATs, and GHG emissions under Horizon Year (2046) Build condition was compared to the No-Build condition. As discussed previously, the proposed Project is not subject to conduct a NEPA analysis.

3.6 CEQA Analysis/Requirement

CEQA applies to most California transportation projects (certain projects are statutorily exempt). CEQA requires the lead agency to explore a range of reasonable alternatives to the project that feasibly attain most of the basic objectives but avoid or substantially lessen any of the significant effects of the project. For CEQA analyses, criteria pollutants, MSATs, and GHG emissions from the future-year build scenario are normally compared with emissions from the baseline (existing condition). However, per CEQA Guidelines Section 15125(a)(2), a lead agency may use projected future conditions (beyond the date of project operations) baseline as the sole baseline for analysis only if it demonstrates with substantial evidence that use of existing conditions would be either misleading or without informative value to decision-makers and the public. The CEQA analysis is presented below in Section 4.3.

CEQA also requires the evaluation of impacts during construction. Short-term effects related to Project construction are presented below in Section 4.2.

Chapter 4 Environmental Consequences

This section describes the methods, impact criteria, and results of air quality analyses for the proposed Project. Analyses in this report were conducted using methodology and assumptions consistent with the requirements of CEQA, the CAA Amendments of 1990, and the California CAA 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),and the FHWA *Updated Interim Guidance on Mobile-Source Air Toxics Analysis in NEPA Documents* (FHWA 2016).

4.1 Impact Criteria

Project-related emissions would have an adverse environmental impact if they were to result in pollutant emissions levels that would either create or worsen an exceedance of an ambient air quality standard (identified in Table 2-1) or contribute to an existing air quality violation.

The SCAQMD has established air quality significance thresholds that are applicable to both construction and operational emissions generated by CEQA projects within its jurisdiction. These significance thresholds were derived using regional emissions modeling to determine maximum allowable mass quantities of pollutant emissions that could be generated by individual projects without adversely affecting air quality and creating public health concerns based on existing pollution levels. These regional pollutant emission thresholds are shown in Table 4-1.

Table 4-1. South Coast Air Quality Management District Regional Significance Thresholds

	Maximum Mass Daily Thresholds (lb/day)	
Pollutant	**Construction**	**Operations**
Volatile Organic Compounds (VOC)[a]	75	55
Nitrogen Oxides (NO_X)	100	55
Carbon Monoxide (CO)	550	550
Sulfur Oxides (SO_X)	150	150
Coarse Particulate Matter (PM_{10})	150	150
Fine Particulate Matter ($PM_{2.5}$)	55	55
Lead (Pb)[b]	3	3

Source: SCAQMD 2019
Notes: lb/day=pounds per day
[a] The terms VOC and ROG are used interchangeably. SCAQMD uses VOC, and CalEEMod uses ROG.
[b] The project would result in no lead emissions sources during the construction period or operations. As such, lead emissions are not evaluated herein.

Aside from regional air quality impacts, projects in the SCAB are also required to analyze local air quality impacts. The SCAQMD has developed Localized Significance Thresholds (LST) that represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standards, and thus would not cause or contribute to localized air quality impacts. LST are developed based on the ambient concentrations of that pollutant for each of the 38 source receptor areas (SRAs) in the SCAB. The localized thresholds, which are found in the mass rate look-up tables in SCAQMD's Final Localized Significance Threshold Methodology document, were developed for the analysis of projects that are less than or equal to five acres in size and applicable only to the following criteria pollutants: NOx, CO, PM_{10}, and $PM_{2.5}$. The analysis of localized air quality impacts focuses only on the on-site activities of a project and does not include emissions that are generated off-site, such as on-road haul or delivery truck trips (SCAQMD 2008).

The mass rate look-up tables developed by SCAQMD present LST values in the form of allowable emissions (in pounds per day) as a function of receptor distance from a project's site boundary. These LST values were developed by SCAQMD for 1-acre, 2-acre, and 5-acre sites and with receptor distances of 82 feet (25 meters), 164 feet (50 meters), 328 feet (100 meters), 656 feet (200 meters), and 1,640 feet (500 meters). The LSTs established for each of the aforementioned site acreages represent the level of pollutant emissions that would not exceed the most stringent applicable federal or state ambient air quality standards. The proposed Project area would be approximately 13 acres, with a daily disturbance area of approximately two acres and the closest sensitive receptor parcels (residences) would be adjacent to the Project area (less than 82 feet from Project area). According to the LST Guidance, projects with boundaries located closer than 82 feet to the nearest receptor should use the LSTs for receptors located at 82 feet. Therefore, the LSTs for the proposed Project were based on a 2-acre site with a receptor distance of 82 feet located in SRA 24 (Perris Valley). The LSTs for the proposed Project are shown in Table 4-2.

Table 4-2. South Coast Air Quality Management District Localized Significance Thresholds

	Maximum Mass Daily Thresholds (lb/day)	
Pollutant	**Construction**	**Operations**
Nitrogen Oxides (NO_X)	170	170
Carbon Monoxide (CO)	883	883
Coarse Particulate Matter (PM_{10})	7	2
Fine Particulate Matter ($PM_{2.5}$)	4	1
Source: SCAQMD 2008 **Note:** lb/day=pounds per day		

4.2 Short-Term Impacts (Construction Emissions)

4.2.1 Construction Equipment, Traffic Congestion, and Fugitive Dust

During construction, short-term degradation of air quality is expected from the release of particulate emissions (airborne dust) generated by demolition, excavation, grading, hauling, and other activities related to construction. Exhaust emissions from construction equipment and mobile sources powered by gasoline or diesel engines are also anticipated; these include CO, nitrogen oxides (NO_X), volatile organic compounds (VOCs), directly emitted PM_{10} and $PM_{2.5}$, and TACs such as DPM. These emissions would be temporary and limited to the immediate area surrounding the construction site. The construction emissions analysis incorporated fugitive dust control measures in accordance with SCAQMD Rule 403, such as watering disturbed areas three times per day.

Under the transportation conformity regulations (40 CFR 93.123(c)(5)), construction-related activities that cause temporary increases in emissions are not required in a hot-spot analysis. These temporary increases in emissions are those that occur only during the construction phase and last 5 years or less at any individual site. They typically fall into two main categories, as follows:

- *Fugitive Dust*: A major emission from construction due to ground disturbance. All air districts and California Health and Safety Code Sections 41700–41701 prohibit "visible emissions" exceeding 3 minutes in 1 hour—this applies not only to dust but also to engine exhaust. In general, this is interpreted as visible emissions crossing the right of way line. In addition, SCAQMD recommends the preparation of a dust plan to reduce construction-related fugitive dust.

  Sources of fugitive dust include disturbed soil at the construction site and trucks carrying uncovered soil. Unless loads are properly controlled, vehicles leaving the site may deposit mud on local streets, which could be an additional source of airborne dust after it dries. PM_{10} emissions may 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, the silt content of the soil, wind speed, and the number of pieces of equipment operating. Larger dust particles settle near the source; fine particles disperse over greater distances from the construction site.

- *Construction Equipment Emissions*: DPM is a California-identified TAC. Localized issues may exist if diesel-powered construction equipment is operated near sensitive receptors.

Construction emissions were estimated using methodologies consistent with the California Emissions Estimator Model (CalEEMod, version 2022.1), developed by the California Air Pollution Control Officers Association. The construction analysis was based on a combination of Project-specific information and conservative default assumptions generated by CalEEMod.

Construction emissions were estimated for the Build Alternative using Project construction scheduling information provided by HDR and model default equipment inventories. Construction emissions for the Build Alternative are presented in Table 4-3 and Table 4-4. The emissions presented are based on the best information available at the time when the calculations were performed. The emissions represent the peak daily construction emissions that would be generated during implementation of the Build Alternative. Because Project construction is expected to last less than 5 years, construction-related emissions were not considered in the conformity analysis.

As shown in Table 4-3 and Table 4-4, the Project's construction emissions would not exceed the SCAQMD's regional and localized significance thresholds.

Table 4-3. Project Construction-Period Regional Emissions Estimates

	Maximum Daily Emissions (lb/day)					
Phase	**ROG**	**NO_X**	**CO**	**SO_2**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Clearing and Grubbing	2	14	14	<0.1	4	2
Asphalt Demolition	1	13	12	<0.1	8	2
Roadway Excavation	3	27	28	<0.1	6	2
Imported Borrow	2	31	22	<1	11	3
Utility Construction	<1	8	10	<0.1	2	<1
Flatwork	<1	4	5	<0.1	2	<1
Aggregate Base	<1	9	10	<0.1	4	<1
Asphalt Paving	20	7	8	<0.1	3	<1
Maximum Daily Emissions	**20**	**31**	**28**	**<1**	**11**	**3**
SCAQMD Significance Threshold	75	100	550	150	150	55
Exceeds Threshold?	No	No	No	No	No	No

Source: Modeling output provided in Appendix A.
Notes: SCAQMD=South Coast Air Quality Management District; lb/day=pounds per day; CO = carbon monoxide; NO_X = nitrogen oxide; $PM_{2.5}$ = fine particulate matter; PM_{10} = suspended particulate matter;
ROG = reactive organic gas; SO_2 = sulfur dioxide
[a] Particulate matter values include exhaust and fugitive dust emissions.

Table 4-4. Project Construction-Period Localized Emissions Estimates

	Maximum Daily Emissions (lb/day)			
Phase	**NO_X**	**CO**	**PM_{10}[a]**	**$PM_{2.5}$[a]**
Clearing and Grubbing	13	14	3.4	1.5
Asphalt Demolition	12	11	6.8	1.9
Roadway Excavation	27	26	4.6	2.1
Imported Borrow	19	19	4.7	1.1
Utility Construction	8	10	1.4	<1
Flatwork	2	4	1.4	<1
Aggregate Base	7	9	1.8	<1
Asphalt Paving	6	7	1.6	<1
Maximum Daily Emissions	**27**	**26**	**6.8**	**2.1**
SCAQMD Significance Threshold	170	883	7	4
Exceeds Threshold?	No	No	No	No

Source: Modeling output provided in Appendix A.
Notes: SCAQMD=South Coast Air Quality Management District; lb/day=pounds per day; CO = carbon monoxide; NO_X = nitrogen oxide; $PM_{2.5}$ = fine particulate matter; PM_{10} = suspended particulate matter;
[a] Particulate matter values include exhaust and fugitive dust emissions.

Implementation of the measures listed below, some of which may also be required for other purposes, such as stormwater pollution control, would reduce air quality impacts resulting from construction activities. Although these measures are anticipated to reduce construction-related emissions, the reductions cannot be quantified at this time.

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

No geologic features that are normally associated with naturally occurring asbestos (i.e., serpentine rock or ultramafic rock near fault zones) are present in or near the Project area

(U.S. Geological Survey and California Geological Survey 2011). Therefore, the impact from naturally occurring asbestos during Project construction would be minimal to none. However, structures, including buildings and bridges, may contain asbestos-containing materials (ACM). Asbestos was used in many building materials prior to 1978; its use may have continued until the early 1980s. ACM are found in fireproofing, acoustic ceiling material, transite pipe, roofing materials, thermal insulation, support piers, expansion joint material in bridges, asphalt, concrete, and other building materials. It is of primary concern when it is friable (i.e., material that can be easily crumbled). During demolition, if not properly identified and mitigated, asbestos fibers could become airborne.

Project improvements would require demolition of the existing asphalt surfaces which may contain ACM. The proposed Project would be required to comply with SCAQMD Rule 1403 (Asbestos Emissions from Demolition/Renovation Activities) which specifies work practices to limit asbestos emissions from building demolition and renovation activities including the removal and disturbance of ACM. This rule is generally designed to protect uses surrounding demolition or renovation activity from exposure to asbestos emissions. Rule 1403 requires surveys of any facility being demolished or renovated for the presence of ACM. Rule 1403 also establishes notification procedures, handling operations, warning label requirements, and removal procedures, including complying with the limitations of the National Emission Standards for Hazardous Air Pollutants regulations as listed in Code of Federal Regulations, Title 40, Part 61.

4.2.3 Lead

Pb is normally not an air quality issue for transportation projects unless the project involves disturbing soil with high levels of aerially deposited Pb or painting or modifying structures with Pb-based coatings. At the time of preparation of this report, testing for aerially deposited Pb had not been conducted. It is not known whether Pb-based paint was used in striping on the existing street. If Pb is encountered, any disturbance of Pb-based paint must meet U.S. EPA and air district rules, pursuant to Caltrans Standard Specifications 14-9.02. There are no industrial Pb sources in the immediate vicinity of the Project.

4.2.4 Valley Fever

Valley fever is not an air pollutant but is a disease caused by inhaling *Coccidioides immitis* (*C. immitis*) spores. The spores are found in certain types of soil and become airborne when the soil is disturbed. Riverside County authorities reported 137 cases in 2018, which is an incidence rate of 5.6 per 100,000 population (California Department of Public Health 2019).

The presence of *C. immitis* in Riverside County does not guarantee that construction activities would result in an increased incidence of Valley fever. Propagation of *C. immitis* is dependent on climatic conditions, with the potential for growth and surface exposure highest following early seasonal rains and long dry spells. Although *C. immitis* spores can be released when areas are disturbed by earthmoving activities, receptors must be exposed to and inhale the spores to be at increased risk of contracting Valley fever. Moreover, exposure to *C. immitis* does not guarantee that an individual will become ill—approximately 60 percent of people exposed to the fungal spores are asymptomatic and show no signs of an infection (U.S. Geological Survey 2000).

Although several factors influence receptor exposure and development of Valley fever, earthmoving activities during construction could release *C. immitis* spores if filaments are present and other soil chemistry and climatic conditions are conducive to spore development. Receptors within several miles of the construction area, particularly adjacent residential receptors to the Project area, may be exposed to an increased risk of inhaling *C. immitis* spores and subsequent development of valley fever. Dust control measures are the primary defense against infection (U.S. Geological Survey 2000). Implementation of the fugitive dust control plan, outlined as a minimization measure, would avoid dusty conditions, and routine watering would reduce the risk of people contracting Valley fever.

4.3 Long-Term Impacts (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, No-Build, and Build conditions.

Long-term air quality impacts are those associated with motor vehicles operating on the roadway network, predominantly those operating in the Project vicinity. Emissions of reactive organic gases (ROG), NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$ for Existing Year (2021), Opening Year (2026), and Horizon Year (2046) conditions under the Project's Build and No-Build conditions were evaluated through modeling using CARB's EMFAC2017 model and vehicle activity data provided in the Project's TIA (HDR 2022a, HDR 2022b). U.S. EPA approved EMFAC2017 on August 15, 2019.

Table 4-5 summarizes the modeled emissions by scenario and compares emissions under the Build condition with emissions under the No-Build condition and existing conditions. The differences in emissions between the Build condition and No-Build condition represent emissions generated directly from implementing the Build Alternative. Vehicular emission rates are anticipated to lessen in future years because of continuing improvements in engine technology and the retirement of older, higher-emitting vehicles.

Table 4-5. Operational Criteria Pollutant Emissions (tons per year)

Scenario/Analysis Year	ROG	NO_X	CO	SO_2	PM_{10}[a]	$PM_{2.5}$[a]
Existing Year (2021)	2	14	56	0.20	49	13
Opening Year (2026) No-Build Condition	1	9	44	0.19	54	14
Opening Year (2026) Build Condition	1	9	44	0.19	54	14
Horizon Year (2046) No-Build Condition	1	11	46	0.21	77	20
Horizon Year (2046) Build Condition	1	11	46	0.21	77	20
Net Emissions Comparison to Existing Conditions						
Opening Year (2026) Build Condition	-1	-5	-12	0	5	1
Horizon Year (2046) Build Condition	-1	-3	-10	0	28	7
Net Emissions Comparison to No-Build Conditions						
Opening Year (2026) Build Condition	0	0	0	0	0	0
Horizon Year (2046) Build Condition	0	0	0	0	0	0

Source: Modeling output provided in Appendix B.
Notes: Modeled using EMFAC2017.
CO = carbon monoxide; NO_X = nitrogen oxide; $PM_{2.5}$ = fine particulate matter; PM_{10} = suspended particulate matter; ROG = reactive organic gas; SO_2 = sulfur dioxide
[a] Particulate matter values include exhaust and fugitive dust emissions.

The emissions analysis presented in Table 4-5 indicates that operation of the Build Alternative under Opening Year (2026) and Horizon Year (2046) conditions would increase PM_{10} and $PM_{2.5}$ emissions compared with existing conditions and decrease ROG, NO_X, and CO emissions. These results are due to factors both internal and external to the Project. The increase in PM is partly due to background growth in VMT from 2021 to 2046 and because PM fugitive dust emissions are a function of VMT and fugitive dust emission factors for tire wear, brake wear, and paved roads are fairly constant for each analysis year, whereas exhaust emission factors tend to decrease in future years. Consequently, total PM emissions increase over time. The decreases in other pollutants are due to expected improvements in vehicle engine technology, fuel efficiency, and turnover in older, more heavily polluting vehicles, which reduces exhaust emissions.

As shown in Table 4-5, implementation of the Build Alternative would not result in a greater increase in criteria pollutant emissions when compared to the No-Build Alternative under Opening Year (2026) and Horizon Year (2046) conditions. This is because the Build Alternative would have a lesser annual VMT than the No-Build Alternative. The Build Alternative would not result in an increase in criteria pollutant emissions; therefore, the proposed Project would not exceed the SCAQMD's regional daily operational thresholds.

The SCAQMD's LST guidance states that LSTs should only evaluate on-site emissions and off-site emissions, such as mobile emissions, should not be included a project's daily emissions for comparison to LSTs. The proposed Project's operational emissions are based solely on mobile emissions, therefore, the operational LST values would not apply to the proposed Project.

4.3.1 CO Analysis

A CO hot spot is a localized concentration of CO that is above the state or national 1-hour or 8-hour ambient air standards for the pollutant. CO hot spots at roadway intersections are typically found in areas with significant traffic congestion. CO is a public health concern because at high enough concentrations, it can cause health problems such as fatigue, headache, confusion, dizziness, and even death. However, it should be noted that ambient concentrations of CO have declined dramatically in California because of existing controls and programs.

SCAQMD's 2003 AQMP is the most recent AQMP that addresses CO concentrations. The 2003 AQMP included a revision to the Federal Attainment Plan for Carbon Monoxide (CO Plan) that was originally approved in 1992 and included a CO hot spots analysis at four specified heavily traveled intersections in Los Angeles at the peak morning and afternoon time periods. These four intersection locations selected for CO modeling were considered to be worst-case intersections that would likely experience the highest CO concentrations. The CO hot spots analysis in the 2003 AQMP did not predict a violation of CO standards at the four intersections. Of the four intersections evaluated in the CO hot spots analysis, the busiest intersection evaluated was that at Wilshire Boulevard and Veteran Avenue, which was described as the most heavily congested intersection in Los Angeles County with an average daily traffic volume of approximately 100,000 vehicles per day (SCAQMD 2003). Based on the CO modeling, the 2003 AQMP estimated that the 1-hour and 8-hour concentrations at this intersection was 4.6 parts per million (ppm) and 3.4 ppm, respectively, which would not exceed the most stringent 1-hour CO standard of 20.0 ppm and 8-hour CO standards of 9 ppm.

Intersection counts for the proposed Project's studied intersections were provided in the Project's Supplemental TIA Memorandum. It was determined that the Build Alternative for Horizon Year (2046) had the highest daily traffic volume of 15,610 vehicles per day at the at the intersection of Wood Road and Markham Street. Because the daily number of vehicles at this study intersection would not nearly exceed 100,000 vehicles per day, it can be concluded that the Project would not exceed the most stringent 1-hour and 8-hour CO standards and no detailed CO hot spots analysis for the Project would be required. Therefore, the Project would not result in impacts related to CO hot spots, and would not contribute a significant level of CO such that localized air quality and human health would be substantially degraded.

4.3.2 PM Analysis

4.3.2.1 Hot-Spot Analysis

In November 2015, U.S. EPA released an updated version of the Transportation Conformity Guidance for quantifying the local air quality impacts of transportation projects and comparing them to the PM NAAQS (75 *Federal Register* 79370). U.S. EPA originally released the quantitative guidance in December 2010 and released a revised version in November 2013 to reflect the approval of EMFAC 2011 and U.S. EPA's 2012 PM NAAQS final rule. The November 2015 version reflects MOVES2014 and its subsequent minor revisions such as MOVES2014a, to revise design value calculations to be more consistent with other U.S. EPA programs, and to reflect guidance implementation and experience in the field. Note that EMFAC, not MOVES, should be used for project hot-spot analysis in California. The Transportation Conformity Guidance requires a hot-spot analysis to be completed for a Project of Air Quality Concern (POAQC).

The final rule in 40 CFR 93.123(b)(1) defines a POAQC as:

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

(ii) Projects affecting intersections that are at 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.

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

The Build Alternative would not result in construction of a new or expanded highway system that would have a significant number of or significant increase in diesel vehicles.

The proposed Project would not affect intersections operating at D, E, or F with a significant number of diesel vehicles. The Build Alternative would improve traffic circulation systems within the Woodcrest community. Tables 4-6 and 4-7 summarize peak-hour LOS and delay at the 4 study area intersections under Opening Year (2026) and Horizon Year (2046) conditions, respectively. Table 4-6 shows that all intersections during both the AM and PM peak hours would be at LOS D or better under Opening Year (2026) No-Build and Build conditions. Table 4-7 shows that all intersections during both the AM and PM peak hours would be at LOS D or better under Horizon Year (2046) No-Build, with the exception of the intersection at Wood Road and Markham Street which would operate at an LOS F. With implementation of the Build Alternative, all intersections including the intersection at Wood Road and Markham Street, would operate at an LOS D or better.

Table 4-6. Opening Year (2026) Project Intersection Operations Analysis

	Opening Year (2026) No-Build Condition				Opening Year (2026) Build Condition			
	AM Peak		PM Peak		AM Peak		PM Peak	
Intersection	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
Roosevelt Street and Markham Street	6.9	A	7.0	A	11.0	B	10.6	B
Birch Street and Markham Street	8.4	A	8.4	A	9.1	A	12.3	B
Cedar Street and Markham Street	8.5	A	8.4	A	10.1	B	11.9	B
Wood Road and Markham Street	42.2	D	51	D	38.4	D	36.1	D
Source: HDR 2022a								

Table 4-7. Horizon Year (2046) Project Intersection Operations Analysis

	Horizon Year (2046) No-Build Condition				Horizon Year (2046) Build Condition			
	AM Peak		PM Peak		AM Peak		PM Peak	
Intersection	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**
Roosevelt Street and Markham Street	6.9	A	7.0	A	11.3	B	11.2	B
Birch Street and Markham Street	8.4	A	8.4	A	9.2	A	12.9	B
Cedar Street and Markham Street	8.5	A	8.4	A	10.3	B	12.5	B
Wood Road and Markham Street	52.5	D	80.3	F	40.0	D	37.3	D
Source: HDR 2022a								

The proposed Project would not include new bus facilities, rail terminals, or transfer points. In addition, the Project would not include expanded bus facilities, rail terminals, or transfer points.

Moreover, the proposed Project would not be expected to introduce significant volumes of diesel truck traffic in the Project area, which could result in localized PM hot spots.

The discussion provided above indicates that the Build Alternative would not be considered a POAQC, as defined by 40 CFR 93.123(b)(1). A detailed PM_{10} and $PM_{2.5}$ hot-spot analysis was not completed because federal CAA and 40 CFR 93.116 requirements would be met without an explicit hot-spot analysis.

4.3.3 NO_2 Analysis

As a surrogate for NO_2 emissions that would result from the proposed Project, NO_X emissions were estimated for the Existing Year (2021) baseline condition, the No-Build Alternative, and the Build Alternative in the Opening Year (2026) and Horizon Year (2046) conditions using Project-specific traffic data and EMFAC2017. As shown in Table 4-5, the Build Alternative would not increase NO_2 emissions in the Project vicinity relative to the No-Build Alternative for the Opening Year (2026) and Horizon Year (2046). In addition, the Build Alternative would decrease NO_2 emissions in the Project vicinity relative to Existing Year (2021) baseline emissions. Overall, implementation of the proposed Project's Build Alternative would not increase NO_2 emissions and would improve traffic circulation systems within the community.

4.3.4 Mobile-Source Air Toxics Analysis

FHWA released updated guidance in October 2016 for determining when and how to address MSAT impacts in the NEPA process for transportation projects (FHWA 2016). 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
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects

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

Projects with low potential MSAT effects are those that improve highway, transit, or freight operations or movements without adding substantial new capacity or creating a facility that is likely to substantially increase emissions.

Projects with high potential MSAT effects include the following:

- Projects that create or significantly alter a major intermodal freight facility with the potential to concentrate high levels of DPM at a single location
- Projects that add significant capacity to urban highways such as interstates, urban arterials, or urban collector-distributor routes where annual average daily traffic (AADT) is projected to be in the range of 140,000 to 150,000, or greater, by the design year
- Projects proposed to be located in proximity to populated areas or, in rural regions, in proximity to concentrations of vulnerable populations (e.g., schools, nursing homes, hospitals)

The purpose of the proposed Project is to improve traffic circulation systems within the Woodcrest community. It has been determined that the proposed Project would generate minimal air quality impacts with respect to federal CAA criteria pollutants. As shown in Table 1-10, annual VMT for the Build Alternative would be slightly less than the VMT for the No-Build Alternative under both Opening Year (2026) and Horizon Year (2046) conditions. Therefore, the proposed Project's Build Alternative would not result in substantial changes in traffic volumes or vehicle mix that would cause a meaningful increase in regional MSAT emissions compared with those of the No-Build Alternative, and the proposed Project would have no impacts in regard to MSAT emissions.

4.4 Odor Analysis

According to the SCAQMD CEQA Air Quality Handbook, land uses associated with odor complaints typically include agricultural uses, wastewater treatment facilities, food processing plants, chemical plants, composting areas, refineries, landfills, dairies, and fiberglass molding facilities. The proposed Project involves improvements of an existing roadway and does not include any of these land uses. Thus, operation of the proposed Project is not expected to result in objectionable odors for the neighboring uses and would not adversely affect a substantial number of people.

During construction of the proposed Project, exhaust from equipment and mobile sources, application of coatings for roadway striping, and asphalt paving activities may produce discernible odors typical of most construction sites. Such odors would be, at worst, a temporary source of nuisance to adjacent uses, if at all, and would not affect a substantial number of people. The Project would use coatings compliant with SCAQMD Rule 1113, which would limit the odors associated with off-gassing from those coatings. Odors associated with asphalt paving would only occur for a limited time period for the Project (approximately 10 days), and the locations of paving activities would be distributed along the Project area. Additionally, material deliveries and heavy-duty haul truck trips could occasionally produce odors from diesel exhaust. These odors would not affect a substantial number of people because construction would be temporary, and construction-generated emissions dissipate rapidly with increasing distance from the source. Overall, odors associated with Project construction would be temporary and intermittent in nature and would not create a significant level of objectionable odors affecting a substantial number of people.

4.5 Greenhouse Gas Emissions Analysis

An individual project does not generate enough GHG emissions to influence global climate change significantly. 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 GHGs.[4] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable." To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. Gathering the needed information on a global scale would be a difficult, if not impossible, task. GHG emissions for transportation projects can be divided into those produced during construction and those during operation, as discussed below.

4.5.1 Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions would be produced at different levels throughout the construction phase. However, their frequency and occurrence could be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases. In addition, with innovations such as pavement with a longer life, improved traffic management plans, and changes in materials, GHG emissions produced during construction could be offset to some degree by longer intervals between maintenance and rehabilitation activities. Tables 4-8 shows construction-period GHG emissions for the Build Alternative, which resulted in approximately 314 metric tons of carbon dioxide equivalents ($MTCO_2e$) over the construction period. Emissions data is summarized in Appendix A.

Table 4-8. Summary of Construction Greenhouse Gas Emissions for Build Alternative (metric tons per year)

Year	CO_2	CH_4	N_2O	CO_2e
Year 1	308	<0.1	<0.1	314
Total	**308**	**<0.1**	**<0.1**	**314**
Source: Modeling output provided in Appendix A. **Notes:** CH_4 = methane; CO_2 = carbon dioxide; CO_2e = CO_2 equivalent; N_2O = nitrous oxide				

4.5.2 Operational Emissions

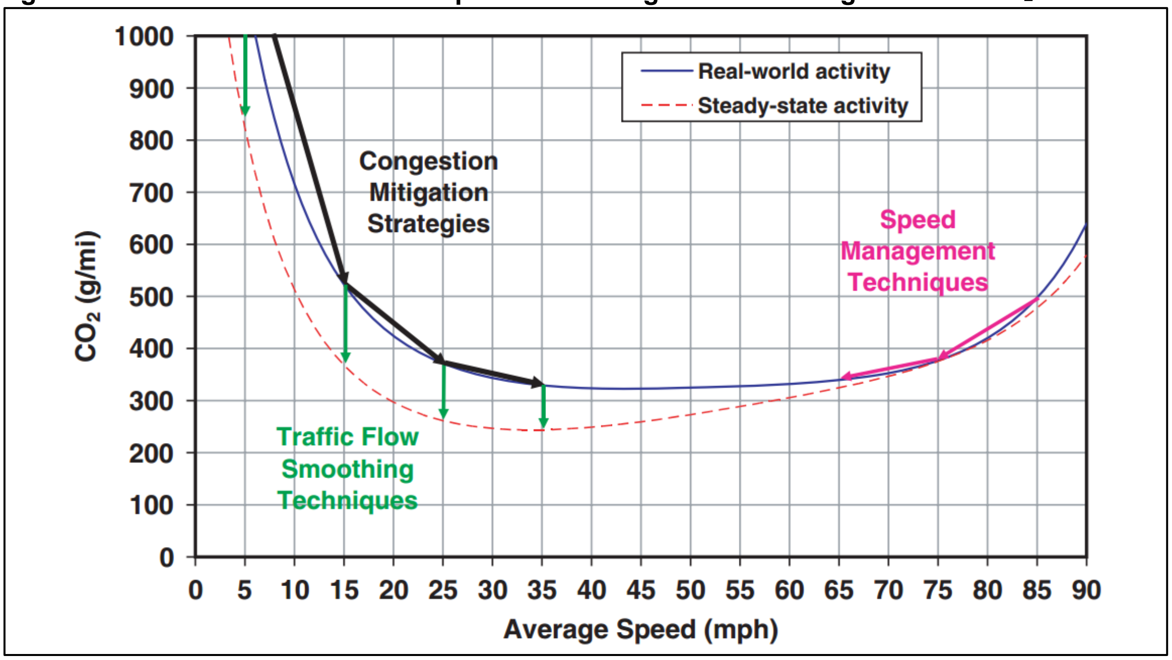
Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity, (3) transitioning to fuels that emit lower levels of GHGs, and (4) improving vehicle technologies and efficiency. To be most effective, all four strategies should be pursued concurrently.

[4] This approach is supported by *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007) as well as the SCAQMD (Chapter 6: *The CEQA Guide*, April 2011) and the U.S. Forest Service (*Climate Change Considerations in Project Level NEPA Analysis*, July 13, 2009).

FHWA supports these strategies to lessen climate change impacts, which correlate with efforts that California is undertaking to reduce GHG emissions from the transportation sector.

The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 mph) and speeds of more than 55 mph; the most severe emissions occur from 0–25 mph (see Figure 4-1). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel corridors, GHG emissions, particularly CO_2, may be reduced.

Figure 4-1. Possible Use of Traffic Operation Strategies in Reducing On-Road CO_2 Emissions



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside, May 2010 (http://uctc.berkeley.edu/research/papers/846.pdf).

As identified in Table 4-9, implementation of the Build Alternative would not result in a greater increase in GHG emissions compared with the No-Build Alternative for the Opening Year (2026) and Horizon Year (2046). This is because the Project would result in a slight reduction in VMT and, as such, would reduce annual GHG emissions relative to the No-Build Alternative.

GHG emissions would decrease under the Build Alternative relative to Existing Year (2021) conditions for the Opening Year (2026), resulting in a net GHG reduction of 480 $MTCO_2e$. This 480 $MTCO_2e$ reduction would offset the 314 $MTCO_2e$ generated during construction. Overall, the Project would result in a net reduction of 166 $MTCO_2e$ for the Build Alternative Opening Year (2026) related to Existing Year (2021) conditions. GHG emissions would increase for the Build Alternative relative to Existing Year (2021) conditions for Horizon Year (2046). The increase in GHG emissions for the Horizon Year (2046) is driven by the growth in VMT from 2021 to 2046.

Table 4-9. Summary of Operational Greenhouse Gas Emissions (metric tons per year)

Scenario/Analysis Year	CO_2e	Annual Vehicle Miles Traveled
Existing Year (2021)	18,620	48,620,419
Opening Year (2026)		
No-Build Alternative	18,142	53,327,018
Build Alternative	18,140	53,322,023
Horizon Year (2046)		
No-Build Alternative	22,170	76,214,018
Build Alternative	22,170	76,212,319

Source: Modeling output provided in Appendix B.
Note: Emissions modeled using EMFAC2017.
CO_2e = carbon dioxide equivalent

4.5.3 Limitations of EMFAC

Although EMFAC has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its emission rates are based on tailpipe emission test data. The numbers are estimates of CO_2 emissions and do not necessarily reflect the actual CO_2 emissions. The model does not account for factors such as the rate of acceleration and vehicle aerodynamics, which influence CO_2 emissions. To account for CO_2 emissions, CARB's GHG inventory follows the Intergovernmental Panel on Climate Change guideline (IPCC 2007) by assuming complete fuel combustion, while still using EMFAC data to calculate CH_4 and N_2O emissions. Although EMFAC is currently the best available tool for use in calculating GHG emissions, the CO_2 numbers provided are useful only for a comparison of alternatives.

4.6 Cumulative/Regional/Indirect Effects

The proposed Project would involve emissions of VOC/ROG and NO_X, both of which contribute to the formation of O_3, secondary PM_{10}, and secondary $PM_{2.5}$ as a result of photochemical reactions during Project construction. As shown in Tables 4-3, construction of the Build Alternative would result in temporary increases in daily emissions of ROG, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$. The proposed Project's maximum daily emissions from construction would not exceed SCAQMD's thresholds of significance for construction. SCAQMD's cumulative air quality impact methodology indicates that if an individual project results in air emissions of criteria pollutants that exceed the SCAQMD's recommended daily thresholds for project-specific impacts, then it would also result in a cumulatively considerable net increase of these criteria pollutants for which the project region is in nonattainment under an applicable federal or state ambient air quality standard. Because the proposed Project's construction pollutant emissions (refer to Table 4-3) would not exceed the applicable SCAQMD's regional significance thresholds, the Project's construction emissions would not be cumulatively considerable.

As shown in Table 4-5, implementation of the proposed Project's Build Alternative would not increase criteria pollutants emissions compared to the No-Build Alternative. In fact, the Build Alternative would result in slightly less VMT compared to the No-Build Alternative, resulting in a net reduction of criteria pollutant emissions. Overall, the Build Alternative would not increase operational emissions of criteria pollutants and would not be cumulatively considerable.

Recognizing that SCAQMD's regional significance thresholds were established to achieve attainment of the NAAQS and CAAQS, which in turn define the maximum amount of an air pollutant that can be present in ambient air without harming public health, the proposed Project's contribution of pollutant emissions is not expected to result in measurable human health impacts on a regional scale.

Chapter 5 Avoidance, Minimization, and/or Mitigation Measures

5.1 Short-Term (Construction) Measures

The following short-term (construction) avoidance/minimization measures would be required to address potential air quality impacts associated with exhaust and fugitive dust emissions during Project construction activities. AQ-1 through AQ-14 are required measures that would avoid or minimize emissions and are not considered mitigation measures. Although these measures are anticipated to reduce construction-related emissions, their reductions could not be quantified; however, as discussed in Section 4.2, Project construction emissions would be below all SCAQMD thresholds.

AQ-1: During construction, the County of Riverside Transportation Department (County) shall ensure that the Project will comply with applicable SCAQMD Rules and Regulations, including, but not limited to:

- **Rule 401– Visible Emissions.** Prohibits discharge into the atmosphere from any single source of emission, whatsoever, including any air contaminant for a period or periods aggregating more than three minutes in any 1 hour that is as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, as published by the U.S. Bureau of Mines.

- **Rule 402– Nuisance.** Prohibits the discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; endanger the comfort, repose, health, or safety of any such persons or the public; or cause, or have a natural tendency to cause, injury or damage to business or property. Odors are regulated under this rule.

- **Rule 403 – Fugitive Dust.** Prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area that remains visible beyond the property line of the emission's source. During construction, best available control measures identified under Rule 403 will be required to minimize fugitive dust emissions from proposed earthmoving and grading activities. These measures would include site pre-watering and re-watering as necessary to maintain sufficient soil moisture content. Additional requirements apply to construction projects on properties with 50 or more acres of disturbed surface area or any earthmoving operation with a daily earthmoving or throughput volume of 5,000 cubic yards or more three times during the most recent 365-day period. These requirements will include submittal of a dust control plan, maintenance of dust control records, and designation of a South Coast Air Quality Management District (SCAQMD)-certified dust control supervisor.

- **Rule 1108 – Cutback Asphalt.** Specifies volatile organic compounds (VOC) content limits for cutback asphalt.

- **Rule 1113 – Architectural Coatings**. Limits the VOC content in architectural coatings used in the SCAQMD jurisdiction. These limits are application-specific and are updated as availability of low-VOC products expands.

AQ-2: During construction, the County shall ensure that the construction contractor complies with the Caltrans' Standard Specifications in Section 14-9 (2018).

Section 14-9-02 specifically requires contractor compliance with all applicable laws and regulations related to air quality, including air pollution control district and air quality management district regulations and local ordinances.

AQ-3: During construction, the County shall ensure that water or a dust palliative be applied to the site and equipment as often as necessary to control fugitive dust emissions.

AQ-4: During construction, the County shall ensure that a soil binder will be spread on any unpaved roads used for construction purposes and on all Project construction parking areas.

AQ-5: During construction, the County shall ensure that trucks be washed as they leave the right-of-way, as necessary, to control fugitive dust emissions.

AQ-6: During construction, the County shall ensure construction equipment and vehicles be properly tuned and maintained. All construction equipment will use low-sulfur fuel, as required by California Code of Regulations Title 17, Section 93114.

AQ-7: During construction, the County shall ensure that a dust control plan be developed, documenting sprinkling, temporary paving, speed limits, and timely revegetation of disturbed slopes as needed to minimize construction impacts on existing communities.

AQ-8: During construction, the County shall ensure that equipment and materials storage sites be located as far away from residential and park uses, as practicable. Construction areas will be kept clean and orderly.

AQ-9: Prior to and during construction, the County shall ensure that environmentally sensitive areas be established near sensitive air receptors. Within these areas, construction activities involving extended idling by diesel equipment or vehicles will be prohibited to the extent feasible.

AQ-10: During construction, the County shall ensure that track-out reduction measures, such as gravel pads at Project access points be used to minimize dust and mud deposits on roads affected by construction traffic.

AQ-11: During construction, the County shall ensure that all transported loads of soil and wet material be covered before transport or adequate freeboard (i.e., space from the top of the material to the top of the truck) be provided to minimize emissions of dust during transportation.

AQ-12: During construction, the County shall ensure that dust and mud deposited on paved public roads due to construction activity and traffic will be promptly and regularly removed to reduce particulate-matter emissions.

AQ-13: During construction, the County shall ensure that construction traffic be scheduled and routed to reduce congestion and related air quality impacts caused by idling vehicles along local roads during peak travel times, to the extent feasible.

AQ-14: During construction, the County shall ensure that mulch be installed, or vegetation planted, as soon as practical after grading to reduce windblown particulate-matter in the area.

5.2 Long-Term (Operational) Measures

No long-term (operational) avoidance, minimization, and/or mitigation measures are required.

Chapter 6 Conclusions

The proposed Project would not have adverse impacts on localized or regional air quality. This determination is based on the following:

- Project construction emissions would be below all SCAQMD regional and localized significance thresholds and would not be cumulatively considerable. Additionally, under the Build Alternative, the Project would implement the required exhaust and fugitive dust emissions control measures, AQ-1 to AQ-14, to avoid or minimize short-term impacts on air quality. Project construction would not create a significant level of objectionable odors affecting a substantial number of people during construction, with the implementation of Measure AQ-1.
- Operation of the Project's Build Alternative would not result in a greater increase of criteria pollutant emissions compared to the No-Build Alternative under the Opening Year (2026) and Horizon Year (2046) conditions.
- The Project, under the Build Alternative, would not result in long-term impacts related to CO hot spots and would not contribute a significant level of CO such that localized air quality and human health would be substantially degraded.
- The Project, under the Build Alternative, was found to have no impacts in regard to MSAT emissions since the Build Alternative would not result in substantial changes in traffic volumes or vehicle mix in accordance with FHWA's updated interim MSAT guidance from October 18, 2016.
- Project operations under the Build Alternative would not create a significant level of objectionable odors affecting a substantial number of people.
- Operation of the Project's Build Alternative under Opening Year (2026) conditions would result in a net GHG reduction compared to Existing Year (2021) conditions. The net GHG reduction would also be large enough to offset GHG emissions generated during construction.
- Operation of the Project's Build Alternative would not result in an increase of GHG emissions compared to the No-Build Alternative under the Opening Year (2026) and Horizon Year (2046) conditions.

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Appendix A: Construction Emissions Inventory Documentation

CONSTRUCTION PHASING DATA

Project Name:	Markham Street Improvements Project
Construction Days per week:	5
Onsite Vehicle Speed (mph):	10
Total Site Disturbance Area (acres):	13.3

Dust Control Measures

Water Exposed Area	Reduction (%)	Water Truck Trips
Dust Control Reduction (Water 2x per day: 3.2-hr interval)[1]	61%	2
Dust Control Reduction (Water 3x per day: 2.1-hr interval)[1]	74%	3
Valued used in analysis	74%	
Unpaved Road Dust Reduction	55%	

Schedule[2]

					Offsite Daily One-Way Vehicle Trips (In/Out)			Offsite Trip Length-Paved (miles)[3,4]			Onsite Daily Trips				Onsite Trip Length-Unpaved (miles)			
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	Workers	Vendors	Haul	Worker	Vendor	Haul	Workers	Vendors	Haul	Water	Worker	Vendor	Haul	Water
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	14	-	8	18.5	10.2	20.0	-	-	4	3	-	0.10	0.10	1.00
Asphalt Demo	2/16/2026	2/22/2026	5	5	10	-	18	18.5	10.2	20.0	-	-	9	3	-	0.10	0.10	1.00
Roadway Excavation	2/23/2026	3/22/2026	5	20	30	-	-	18.5	10.2	20.0	-	-	-	3	-	0.10	0.10	1.00
Imported Borrow	3/23/2026	4/19/2026	5	20	26	-	132	18.5	10.2	20.0	-	-	66	3	-	0.10	0.10	1.00
Utility Construction	4/20/2026	6/13/2026	5	40	14	4	4	18.5	10.2	20.0	-	2	2	3	-	0.10	0.10	1.00
Flatwork	6/14/2026	7/10/2026	5	20	6	12	8	18.5	10.2	20.0	-	6	4	3	-	0.10	0.10	1.00
Aggregate Base	6/27/2026	7/19/2026	5	15	18	-	24	18.5	10.2	20.0	-	-	12	3	-	0.10	0.10	1.00
Asphalt Paving	7/21/2026	8/3/2026	5	10	18	24	-	18.5	10.2	20.0	-	12	-	3	-	0.10	0.10	1.00

Asphalt Demo Quantity

Parameter	Value
Asphalt Area (ft^2):[5]	64,050
Depth (ft):	0.33
Total Volume (ft^3) with 10% Contingency:	**23,485**
Total Volume (CY):	**870**
Haul Truck Capacity (CY/Truck):[6]	20
Number of Trucks Required:	44
Number of Truck Trips (In/Out):	88
# of Days in **Asphalt Demo** Phase:	5
Number of Truck Trips (In/Out) per Day:	18

Earthwork Quantities

Parameter	Value
Cut (CY):	24,000
Net Import (CY):	**26,260**
Haul Truck Capacity (CY/Truck):[6]	20
Number of Trucks Required:	1314
Number of Truck Trips (In/Out):	2628
# of Days in **Imported Borrow** Phase:	20
Number of Truck Trips (In/Out) per Day:	132

Concrete Quantity for Flatwork[5]

Parameter	Unit	Value	Width (ft)	Height (ft)	Volume (ft^3)	Volume (CY)
MINOR CONCRETE (CURB AND GUTTER) (CRS 201)	LF	5,030	0.5	0.8	2012	75
MINOR CONCRETE (SIDEWALK)	SQFT	30,150	-	0.33	9949.5	369
MINOR CONCRETE (DRIVEWAY APPROACH) (CRS 207)	SQFT	625	-	0.67	418.75	16
MINOR CONCRETE (DRIVEWAY)	CY	271	-	-		271
MINOR CONCRETE (CROSS-GUTTER AND SPANDREL)	SQFT	4,632	-	0.67	3103.44	115
MINOR CONCRETE (GUTTER DEPRESSION)	SQFT	1,125	-	0.67	753.75	28
MINOR CONCRETE (MINOR STRUCTURE)	CY	254	-	-		254
						1128

Parameter	Value
Total Volume (CY):	1,128
Concrete Truck Capacity (CY/Truck):	10
Number of Trucks Required:	114
Number of Truck Trips (In/Out)	228
# of Days in **Flatwork** Phase:	20
Number of Truck Trips (In/Out) per Day	12

Notes:

1.2022 CalEEMod User's Guide, Appendix C
2. Phasing and durations from Equipment Utilization data provided by HDR.
3. Trip length values based on CalEEMod default values for SCAQMD.
4. EMFAC Vehicle Categories- Worker: 50% LHDT1/50% LHDT2; Vendor: 50% MHDT/50% HHDT; Haul: 100% HHDT
5. Data from Markham Street Estimate provided by HDR.
6. CalEEMod default value for truck capacity.

Offroad Equipment List

Phase	Equipment	CalEEMod Equipment Type	Quantity	Hours per Day	# of Worker Per Equipment[1]	# of Workers	# of Daily Worker Trips (In/Out)	Total Daily Worker Trips (In/Out)
Clearing and Grubbing	Dozer	Rubber Tired Dozers	1	8	1.25	1.25	2.5	14
Clearing and Grubbing	Excavator	Excavators	1	8	1.25	1.25	2.5	
Clearing and Grubbing	Backhoe/Loader	Tractors/Loaders/Backhoes	1	8	1.25	1.25	2.5	
Clearing and Grubbing	Mulcher	Other Construction Equipment	1	8	1.25	1.25	2.5	
Clearing and Grubbing	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Asphalt Demo	Dozer	Rubber Tired Dozers	1	8	1.25	1.25	2.5	10
Asphalt Demo	Excavator	Excavators	1	8	1.25	1.25	2.5	
Asphalt Demo	Backhoe/Loader	Tractors/Loaders/Backhoes	1	8	1.25	1.25	2.5	
Asphalt Demo	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Roadway Excavation	Dozer	Rubber Tired Dozers	1	8	1.25	1.25	2.5	30
Roadway Excavation	Excavator	Excavators	1	8	1.25	1.25	2.5	
Roadway Excavation	Scraper	Scrapers	2	8	1.25	2.5	10	
Roadway Excavation	Grader	Graders	1	8	1.25	1.25	2.5	
Roadway Excavation	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Roadway Excavation	Roller	Rollers	2	8	1.25	2.5	10	
Imported Borrow	Scraper	Scrapers	2	8	1.25	2.5	10	26
Imported Borrow	Grader	Graders	1	8	1.25	1.25	2.5	
Imported Borrow	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Imported Borrow	Roller	Rollers	2	8	1.25	2.5	10	
Utility Construction	Excavator	Excavators	1	8	1.25	1.25	2.5	14
Utility Construction	Backhoe/Loader	Tractors/Loaders/Backhoes	1	8	1.25	1.25	2.5	
Utility Construction	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Utility Construction	Crane	Cranes	1	8	1.25	1.25	2.5	
Utility Construction	Forklift	Rough Terrain Forklifts	1	8	1.25	1.25	2.5	
Flatwork	Backhoe/Loader	Tractors/Loaders/Backhoes	1	8	1.25	1.25	2.5	6
Flatwork	Forklift	Rough Terrain Forklifts	1	8	1.25	1.25	2.5	
Aggregate Base	Backhoe/Loader	Tractors/Loaders/Backhoes	1	8	1.25	1.25	2.5	18
Aggregate Base	Grader	Graders	1	8	1.25	1.25	2.5	
Aggregate Base	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Aggregate Base	Roller	Rollers	2	8	1.25	2.5	10	
Asphalt Paving	Backhoe/Loader	Tractors/Loaders/Backhoes	1	8	1.25	1.25	2.5	18
Asphalt Paving	Sweeper	Sweepers/Scrubbers	1	8	1.25	1.25	2.5	
Asphalt Paving	Roller	Rollers	2	8	1.25	2.5	10	
Asphalt Paving	Paver	Pavers	1	8	1.25	1.25	2.5	

Notes:
1. CalEEMod default value

Maximum Daily Regional Emissions

Phase Name	Start Date	End Date	Workdays per Week	# of Workdays	Daily Emissions (lb/day) ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total
Clearing and Grubbing	2/2/26	2/15/26	5	10	1.51	13.84	14.34	0.03	3.68	0.58	4.26	1.20	0.54	1.74
Asphalt Demo	2/16/26	2/22/26	5	5	1.34	13.13	12.22	0.03	7.44	0.50	7.94	1.79	0.46	2.25
Roadway Excavation	2/23/26	3/22/26	5	20	3.27	27.35	27.53	0.06	4.51	1.15	5.66	1.32	1.06	2.38
Imported Borrow	3/23/26	4/19/26	5	20	2.48	30.87	21.89	0.14	10.54	0.92	11.45	2.07	0.85	2.92
Utility Construction	4/20/26	6/13/26	5	40	0.87	8.19	10.37	0.02	1.89	0.28	2.17	0.30	0.26	0.56
Flatwork	6/14/26	7/10/26	5	20	0.22	3.53	4.69	0.02	2.14	0.07	2.21	0.34	0.07	0.40
Aggregate Base	6/27/26	7/19/26	5	15	0.97	9.02	10.25	0.03	3.21	0.34	3.55	0.58	0.31	0.89
Asphalt Paving	7/21/26	8/3/26	5	10	20.34	6.57	8.46	0.02	2.55	0.25	2.80	0.43	0.23	0.66
Maximum Daily Emissions					**20.34**	**30.87**	**27.53**	**0.14**	**10.54**	**1.15**	**11.45**	**2.07**	**1.06**	**2.92**
SCAQMD Regional Emissions Thresholds[1]					75	100	550	150	n/a	n/a	150	n/a	n/a	55
Threshold Exceeded?					**No**	**No**	**No**	**No**	--	--	**No**	--	--	**No**

Total Emissions

Phase Name	Start Date	End Date	Workdays per Week	# of Workdays	Total Emissions (tons) ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	Total Emissions (metric tons)[2] CO_2	CH_4	N_2O	CO_2e
Clearing and Grubbing	2/2/26	2/15/26	5	10	0.01	0.07	0.07	0.00	0.02	0.00	0.02	0.01	0.00	0.01	13.93	0.00	0.00	14.09
Asphalt Demo	2/16/26	2/22/26	5	5	0.00	0.03	0.03	0.00	0.02	0.00	0.02	0.00	0.00	0.01	7.72	0.00	0.00	7.87
Roadway Excavation	2/23/26	3/22/26	5	20	0.03	0.27	0.28	0.00	0.03	0.01	0.04	0.00	0.01	0.02	61.20	0.00	0.00	61.43
Imported Borrow	3/23/26	4/19/26	5	20	0.02	0.31	0.22	0.00	0.11	0.01	0.11	0.02	0.01	0.03	131.35	0.00	0.01	135.50
Utility Construction	4/20/26	6/13/26	5	40	0.02	0.16	0.21	0.00	0.04	0.01	0.04	0.01	0.01	0.01	46.48	0.00	0.00	46.99
Flatwork	6/14/26	7/10/26	5	20	0.00	0.04	0.05	0.00	0.02	0.00	0.02	0.00	0.00	0.00	15.28	0.00	0.00	15.72
Aggregate Base	6/27/26	7/19/26	5	15	0.01	0.07	0.08	0.00	0.02	0.00	0.03	0.00	0.00	0.01	22.19	0.00	0.00	22.78
Asphalt Paving	7/21/26	8/3/26	5	10	0.10	0.03	0.04	0.00	0.01	0.00	0.01	0.00	0.00	0.00	9.37	0.00	0.00	9.56
Total Emissions					**0.20**	**0.98**	**0.97**	**0.00**	**0.27**	**0.03**	**0.30**	**0.05**	**0.03**	**0.08**	**307.51**	**0.01**	**0.02**	**313.94**

Notes:

1. SCAQMD, Air Quality Significance Thresholds, April 2019.
2. Global warming potentials based on IPCC AR4, consistent with CARB emission inventory methods.

Maximum Daily Localized Emissions (Onsite Emisions Only)

	Daily Emissions (lb/day)			
Phase Name	**NO_X**	**CO**	**PM_{10} Total**	**$PM_{2.5}$ Total**
Clearing and Grubbing	13.09	13.56	3.40	1.51
Asphalt Demo	11.52	11.49	6.78	1.94
Roadway Excavation	27.25	26.12	4.58	2.12
Imported Borrow	19.23	18.80	4.68	1.10
Utility Construction	7.64	9.62	1.40	0.36
Flatwork	2.35	4.20	1.38	0.19
Aggregate Base	6.86	9.06	1.84	0.44
Asphalt Paving	5.60	7.42	1.63	0.36
Maximum Daily Emissions	**27.25**	**26.12**	**6.78**	**2.12**
SCAQMD Localized Significance Thresholds	170	883	7	4
Threshold Exceeded?	**No**	**No**	**No**	**No**

Localized Significance Thresholds (LSTs)

Source Receptor Area (SRA): 24, Perris Valley

Daily Site Disturbance Size (acres): 2

Receptor Distance (meters): 25

Pollutant	**LST (lb/day)**
NO_X	170
CO	883
PM_{10}	7
$PM_{2.5}$	4

Source: SCAQMD. Appendix C - Mass Rate LST Look-up Tables

OFFROAD EQUIPMENT (ONSITE)[1]

													Emission Factor (g/bhp-hr)[4]												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	First Year of CSTN	Equipment Type	CalEEmod Equipment Type	Fuel Type	# of Equipment	Daily Usage (hr/day)[2]	HP[3]	LF[3]	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Dozer	Rubber Tired Dozers	Diesel	1	8	367	0.40	0.353	3.223	2.726	0.005	-	0.142	0.142	-	0.131	0.131	532.550	0.022	0.004
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.393	3.407	4.221	0.005	-	0.099	0.099	-	0.091	0.091	587.029	0.024	0.005
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.184	1.885	3.481	0.005	-	0.063	0.063	-	0.058	0.058	529.707	0.021	0.004
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Mulcher	Other Construction Equipment	Diesel	1	8	82	0.42	0.282	2.734	3.504	0.005	-	0.158	0.158	-	0.145	0.145	527.541	0.021	0.004
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Dozer	Rubber Tired Dozers	Diesel	1	8	367	0.40	0.353	3.223	2.726	0.005	-	0.142	0.142	-	0.131	0.131	532.550	0.022	0.004
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.393	3.407	4.221	0.005	-	0.099	0.099	-	0.091	0.091	587.029	0.024	0.005
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.184	1.885	3.481	0.005	-	0.063	0.063	-	0.058	0.058	529.707	0.021	0.004
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Dozer	Rubber Tired Dozers	Diesel	1	8	367	0.40	0.353	3.223	2.726	0.005	-	0.142	0.142	-	0.131	0.131	532.550	0.022	0.004
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.393	3.407	4.221	0.005	-	0.099	0.099	-	0.091	0.091	587.029	0.024	0.005
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Scraper	Scrapers	Diesel	2	8	423	0.48	0.196	1.741	1.539	0.005	-	0.068	0.068	-	0.062	0.062	528.854	0.021	0.004
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Grader	Graders	Diesel	1	8	148	0.41	0.313	2.528	3.397	0.005	-	0.140	0.140	-	0.129	0.129	530.815	0.022	0.004
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.542	3.614	4.093	0.005	-	0.154	0.154	-	0.142	0.142	586.914	0.024	0.005
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Scraper	Scrapers	Diesel	2	8	423	0.48	0.196	1.741	1.539	0.005	-	0.068	0.068	-	0.062	0.062	528.854	0.021	0.004
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Grader	Graders	Diesel	1	8	148	0.41	0.313	2.528	3.397	0.005	-	0.140	0.140	-	0.129	0.129	530.815	0.022	0.004
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.542	3.614	4.093	0.005	-	0.154	0.154	-	0.142	0.142	586.914	0.024	0.005
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.393	3.407	4.221	0.005	-	0.099	0.099	-	0.091	0.091	587.029	0.024	0.005
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.184	1.885	3.481	0.005	-	0.063	0.063	-	0.058	0.058	529.707	0.021	0.004
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Crane	Cranes	Diesel	1	8	367	0.29	0.198	1.837	1.637	0.005	-	0.075	0.075	-	0.069	0.069	527.461	0.021	0.004
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Forklift	Rough Terrain Forklifts	Diesel	1	8	96	0.40	0.115	1.643	3.220	0.005	-	0.033	0.033	-	0.030	0.030	528.889	0.021	0.004
Flatwork	6/14/2026	7/10/2026	5	20	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.184	1.885	3.481	0.005	-	0.063	0.063	-	0.058	0.058	529.707	0.021	0.004
Flatwork	6/14/2026	7/10/2026	5	20	2026	Forklift	Rough Terrain Forklifts	Diesel	1	8	96	0.40	0.115	1.643	3.220	0.005	-	0.033	0.033	-	0.030	0.030	528.889	0.021	0.004
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.184	1.885	3.481	0.005	-	0.063	0.063	-	0.058	0.058	529.707	0.021	0.004
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Grader	Graders	Diesel	1	8	148	0.41	0.313	2.528	3.397	0.005	-	0.140	0.140	-	0.129	0.129	530.815	0.022	0.004
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.542	3.614	4.093	0.005	-	0.154	0.154	-	0.142	0.142	586.914	0.024	0.005
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.184	1.885	3.481	0.005	-	0.063	0.063	-	0.058	0.058	529.707	0.021	0.004
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.584	3.759	4.731	0.005	-	0.171	0.171	-	0.157	0.157	586.659	0.024	0.005
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.542	3.614	4.093	0.005	-	0.154	0.154	-	0.142	0.142	586.914	0.024	0.005
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Paver	Pavers	Diesel	1	8	81	0.42	0.237	2.533	3.431	0.005	-	0.129	0.129	-	0.119	0.119	525.804	0.021	0.004

Notes:

1. Phasing and durations from Equipment Utilization data provided by HDR.
2. Daily construction activities would occur for 8 hours per day, 5 days per week.
3. Horsepower and load factors based on default values from CalEEMod.
4. Emission factors based on CalEEMod fleet average.

OFFROAD EQUIPMENT (ONSITE)[1]

													Daily Emissions (lb/day)												
Phase Name	**Start Date**	**End Date**	**Workdays per Week**	**Total Workdays**	**First Year of CSTN**	**Equipment Type**	**CalEEmod Equipment Type**	**Fuel Type**	**# of Equipment**	**Daily Usage (hr/day)[2]**	**HP[3]**	**LF[3]**	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10} Fugitive**	**PM_{10} Exhaust**	**PM_{10} Total**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Total**	**CO_2**	**CH_4**	**N_2O**
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Dozer	Rubber Tired Dozers	Diesel	1	8	367	0.40	0.91	8.34	7.06	0.013	-	0.37	0.37	-	0.34	0.34	1378.83	0.056	0.011
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.09	0.82	1.02	0.001	-	0.02	0.02	-	0.02	0.02	141.63	0.006	0.001
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.10	1.03	1.91	0.003	-	0.03	0.03	-	0.03	0.03	290.36	0.012	0.002
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Mulcher	Other Construction Equipment	Diesel	1	8	82	0.42	0.17	1.66	2.13	0.003	-	0.10	0.10	-	0.09	0.09	320.44	0.013	0.003
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Dozer	Rubber Tired Dozers	Diesel	1	8	367	0.40	0.91	8.34	7.06	0.013	-	0.37	0.37	-	0.34	0.34	1378.83	0.056	0.011
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.09	0.82	1.02	0.001	-	0.02	0.02	-	0.02	0.02	141.63	0.006	0.001
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.10	1.03	1.91	0.003	-	0.03	0.03	-	0.03	0.03	290.36	0.012	0.002
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Dozer	Rubber Tired Dozers	Diesel	1	8	367	0.40	0.91	8.34	7.06	0.013	-	0.37	0.37	-	0.34	0.34	1378.83	0.056	0.011
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.09	0.82	1.02	0.001	-	0.02	0.02	-	0.02	0.02	141.63	0.006	0.001
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Scraper	Scrapers	Diesel	2	8	423	0.48	1.40	12.47	11.02	0.035	-	0.49	0.49	-	0.45	0.45	3787.67	0.154	0.031
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Grader	Graders	Diesel	1	8	148	0.41	0.33	2.71	3.64	0.005	-	0.15	0.15	-	0.14	0.14	568.09	0.023	0.005
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.26	1.74	1.97	0.003	-	0.07	0.07	-	0.07	0.07	283.21	0.011	0.002
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Scraper	Scrapers	Diesel	2	8	423	0.48	1.40	12.47	11.02	0.035	-	0.49	0.49	-	0.45	0.45	3787.67	0.154	0.031
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Grader	Graders	Diesel	1	8	148	0.41	0.33	2.71	3.64	0.005	-	0.15	0.15	-	0.14	0.14	568.09	0.023	0.005
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.26	1.74	1.97	0.003	-	0.07	0.07	-	0.07	0.07	283.21	0.011	0.002
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Excavator	Excavators	Diesel	1	8	36	0.38	0.09	0.82	1.02	0.001	-	0.02	0.02	-	0.02	0.02	141.63	0.006	0.001
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.10	1.03	1.91	0.003	-	0.03	0.03	-	0.03	0.03	290.36	0.012	0.002
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Crane	Cranes	Diesel	1	8	367	0.29	0.37	3.45	3.07	0.009	-	0.14	0.14	-	0.13	0.13	990.10	0.040	0.008
Utility Construction	4/20/2026	6/13/2026	5	40	2026	Forklift	Rough Terrain Forklifts	Diesel	1	8	96	0.40	0.08	1.11	2.18	0.003	-	0.02	0.02	-	0.02	0.02	358.20	0.015	0.003
Flatwork	6/14/2026	7/10/2026	5	20	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.10	1.03	1.91	0.003	-	0.03	0.03	-	0.03	0.03	290.36	0.012	0.002
Flatwork	6/14/2026	7/10/2026	5	20	2026	Forklift	Rough Terrain Forklifts	Diesel	1	8	96	0.40	0.08	1.11	2.18	0.003	-	0.02	0.02	-	0.02	0.02	358.20	0.015	0.003
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.10	1.03	1.91	0.003	-	0.03	0.03	-	0.03	0.03	290.36	0.012	0.002
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Grader	Graders	Diesel	1	8	148	0.41	0.33	2.71	3.64	0.005	-	0.15	0.15	-	0.14	0.14	568.09	0.023	0.005
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.26	1.74	1.97	0.003	-	0.07	0.07	-	0.07	0.07	283.21	0.011	0.002
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Backhoe/Loader	Tractors/Loaders/Backhoes	Diesel	1	8	84	0.37	0.10	1.03	1.91	0.003	-	0.03	0.03	-	0.03	0.03	290.36	0.012	0.002
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Sweeper	Sweepers/Scrubbers	Diesel	1	8	36	0.46	0.17	1.10	1.38	0.002	-	0.05	0.05	-	0.05	0.05	171.34	0.007	0.001
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Roller	Rollers	Diesel	2	8	36	0.38	0.26	1.74	1.97	0.003	-	0.07	0.07	-	0.07	0.07	283.21	0.011	0.002
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	Paver	Pavers	Diesel	1	8	81	0.42	0.14	1.52	2.06	0.003	-	0.08	0.08	-	0.07	0.07	315.49	0.013	0.003

Notes:

1. Phasing and durations from Equipment Utilization data provided by HDR.
2. Daily construction activities would occur for 8 hours per day, 5 days per week.
3. Horsepower and load factors based on default values from CalEEMod.
4. Emission factors based on CalEEMod fleet average.

Demo Dust Control Reduction 74%

DEMOLITION FUGITIVE DUST (ONSITE)

									Demolition EF (lb/ton)[1]						Daily Emissions (lb/day)					
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	Total Demo Area (SF)	Demo SF per Day	Conversion Factor (ton/SF demo area)	Demo Debris Weight (tons)	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	64050	12,810.00	0.046	589.26	0.022	-	0.022	0.003	-	0.003	3.31	-	3.31	0.50	-	0.50
Roadway Excavation	2/23/2026	3/22/2026	5	20	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-
Flatwork	6/14/2026	7/10/2026	5	20	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	-	0.00	0.046	0.00	0.022	-	0.022	0.003	-	0.003	-	-	-	-	-	-

Notes:
1. Emission factor based on CalEEMod default value.
2. Emissions account for dust control measures.

Dust Control Reduction 74%

TRUCK LOADING FUGITIVE DUST (ONSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	Total CY[4]	Tons/CY[3]	Total Throughput (tons)	Daily Throughput (tons)	Truck Loading EF (lb/ton throughput)[1]						Daily Emissions (lb/day)[2]					
									PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	-	1.264	-	-	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	-	1.264	-	-	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	24,000	1.264	30,340	1,517	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	0.04	-	0.04	0.01	-	0.01
Imported Borrow	3/23/2026	4/19/2026	5	20	26,260	1.264	33,197	1,660	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	0.05	-	0.05	0.01	-	0.01
Utility Construction	4/20/2026	6/13/2026	5	40	-	1.264	-	-	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	-	-	-	-	-	-
Flatwork	6/14/2026	7/10/2026	5	20	-	1.264	-	-	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	-	1.264	-	-	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	-	1.264	-	-	1.05E-04	-	1.05E-04	1.60E-05	-	1.60E-05	-	-	-	-	-	-

Notes:

1. Emission factor based on CalEEMod default value.
2. Emissions account for dust control reduction from water application 3 times per day.
3. Conversion factor based on CalEEMod default value.

Dust Control Reduction 74%

BULLDOZING FUGITIVE DUST (ONSITE)

								Bulldozing EF (lb/hr)[1]						Daily Emissions (lb/day)[2]					
Phase Name	**Start Date**	**End Date**	**Workdays per Week**	**Total Workdays**	**CalEEmod Equipment Type**	**# of Equipment**	**Daily Usage (hr/day)[2]**	**PM_{10} Fugitive**	**PM_{10} Exhaust**	**PM_{10} Total**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Total**	**PM_{10} Fugitive**	**PM_{10} Exhaust**	**PM_{10} Total**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Total**
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Rubber Tired Dozers	1	8	0.75	-	0.75	0.41	-	0.41	1.57	-	1.57	0.86	-	0.86
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Excavators	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Tractors/Loaders/Backhoes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Other Construction Equipment	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	Rubber Tired Dozers	1	8	0.75	-	0.75	0.41	-	0.41	1.57	-	1.57	0.86	-	0.86
Asphalt Demo	2/16/2026	2/22/2026	5	5	Excavators	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	Tractors/Loaders/Backhoes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Rubber Tired Dozers	1	8	0.75	-	0.75	0.41	-	0.41	1.57	-	1.57	0.86	-	0.86
Roadway Excavation	2/23/2026	3/22/2026	5	20	Excavators	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Scrapers	2	8	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Graders	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Rollers	2	8	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	Scrapers	2	8	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	Graders	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	Rollers	2	8	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Excavators	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Tractors/Loaders/Backhoes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Cranes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Rough Terrain Forklifts	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Flatwork	6/14/2026	7/10/2026	5	20	Tractors/Loaders/Backhoes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Flatwork	6/14/2026	7/10/2026	5	20	Rough Terrain Forklifts	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Tractors/Loaders/Backhoes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Graders	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Rollers	2	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Tractors/Loaders/Backhoes	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Sweepers/Scrubbers	1	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Rollers	2	8	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Pavers	1	8	-	-	-	-	-	-	-	-	-	-	-	-

Notes:
1. Emission factor based on CalEEMod default value.
2. Emissions account for dust control reduction from water application 3 times per day.

Dust Control Reduction 74%

GRADING FUGITIVE DUST (ONSITE)

												Grading EF (lb/VMT)[1]						Daily Emissions (lb/day)[2]					
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	CalEEmod Equipment Type	# of Equipment	Daily Usage (hr/day)[2]	Acres Graded per 8-hr day	Scaling Factor	Acres per day	Daily VMT	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Rubber Tired Dozers	1	8	0.50	8	0.50	0.34	1.54	-	1.54	0.17	-	0.17	0.14	-	0.14	0.01	-	0.01
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Excavators	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Tractors/Loaders/Backhoes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Other Construction Equipment	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	Rubber Tired Dozers	1	8	0.50	8	0.50	0.34	1.54	-	1.54	0.17	-	0.17	0.14	-	0.14	0.01	-	0.01
Asphalt Demo	2/16/2026	2/22/2026	5	5	Excavators	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	Tractors/Loaders/Backhoes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Rubber Tired Dozers	1	8	0.50	8	0.50	0.34	1.54	-	1.54	0.17	-	0.17	0.14	-	0.14	0.01	-	0.01
Roadway Excavation	2/23/2026	3/22/2026	5	20	Excavators	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Scrapers	2	8	1.00	8	2.00	1.38	1.54	-	1.54	0.17	-	0.17	0.55	-	0.55	0.06	-	0.06
Roadway Excavation	2/23/2026	3/22/2026	5	20	Graders	1	8	0.50	8	0.50	0.34	1.54	-	1.54	0.17	-	0.17	0.14	-	0.14	0.01	-	0.01
Roadway Excavation	2/23/2026	3/22/2026	5	20	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	Rollers	2	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	Scrapers	2	8	1.00	8	2.00	1.38	1.54	-	1.54	0.17	-	0.17	0.55	-	0.55	0.06	-	0.06
Imported Borrow	3/23/2026	4/19/2026	5	20	Graders	1	8	0.50	8	0.50	0.34	1.54	-	1.54	0.17	-	0.17	0.14	-	0.14	0.01	-	0.01
Imported Borrow	3/23/2026	4/19/2026	5	20	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	Rollers	2	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Excavators	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Tractors/Loaders/Backhoes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Cranes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	Rough Terrain Forklifts	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Flatwork	6/14/2026	7/10/2026	5	20	Tractors/Loaders/Backhoes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Flatwork	6/14/2026	7/10/2026	5	20	Rough Terrain Forklifts	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Tractors/Loaders/Backhoes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Graders	1	8	0.50	8	0.50	0.34	1.54	-	1.54	0.17	-	0.17	0.14	-	0.14	0.01	-	0.01
Aggregate Base	6/27/2026	7/19/2026	5	15	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Aggregate Base	6/27/2026	7/19/2026	5	15	Rollers	2	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Tractors/Loaders/Backhoes	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Sweepers/Scrubbers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Rollers	2	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	Pavers	1	8	-	8	-	-	1.54	-	1.54	0.17	-	0.17	-	-	-	-	-	-

Notes:

1. Emission factor based on CalEEMod default value.
2. Emissions account for dust control reduction from water application 3 times per day.

WORKER VEHICLES (OFFSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Worker One-Way Trips per Day (In/Out)	Worker Trip Length (miles)	Running Emission Factor (g/mile)[1,2] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	14	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	10	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	30	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	26	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Utility Construction	4/20/2026	6/13/2026	5	40	2026	14	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Flatwork	6/14/2026	7/10/2026	5	20	2026	6	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	18	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	18	18.5	0.015	0.067	0.973	0.003	0.881	0.002	0.883	0.217	0.001	0.219	319.654	0.004	0.006

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; Light-Duty Mix (50% LDA/25% LDT1/25% LDT2); **Fuel Type:** Gasoline.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

WORKER VEHICLES (OFFSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Worker One-Way Trips per Day (In/Out)	Worker Trip Length (miles)	Non-Running Emission Factor (g/trip)[1,3] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	14	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	10	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	30	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	26	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Utility Construction	4/20/2026	6/13/2026	5	40	2026	14	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Flatwork	6/14/2026	7/10/2026	5	20	2026	6	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	18	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	18	18.5	1.128	0.274	3.324	0.001	-	0.002	0.002	-	0.002	0.002	78.330	0.072	0.033

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; Light-Duty Mix (50% LDA/25% LDT1/25% LDT2); **Fuel Type:** Gasoline.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

WORKER VEHICLES (OFFSITE)

								Daily Emissions (lb/day)												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Worker One-Way Trips per Day (In/Out)	Worker Trip Length (miles)	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	14	18.5	0.043	0.047	0.658	0.002	0.503	0.001	0.504	0.124	0.001	0.125	184.940	0.004	0.004
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	10	18.5	0.031	0.034	0.470	0.001	0.359	0.001	0.360	0.089	0.001	0.089	132.100	0.003	0.003
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	30	18.5	0.093	0.101	1.411	0.004	1.078	0.002	1.080	0.266	0.002	0.268	396.299	0.009	0.010
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	26	18.5	0.081	0.087	1.223	0.003	0.935	0.002	0.936	0.230	0.002	0.232	343.459	0.008	0.008
Utility Construction	4/20/2026	6/13/2026	5	40	2026	14	18.5	0.043	0.047	0.658	0.002	0.503	0.001	0.504	0.124	0.001	0.125	184.940	0.004	0.004
Flatwork	6/14/2026	7/10/2026	5	20	2026	6	18.5	0.019	0.020	0.282	0.001	0.216	0.000	0.216	0.053	0.000	0.054	79.260	0.002	0.002
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	18	18.5	0.056	0.060	0.847	0.002	0.647	0.001	0.648	0.160	0.001	0.161	237.779	0.006	0.006
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	18	18.5	0.056	0.060	0.847	0.002	0.647	0.001	0.648	0.160	0.001	0.161	237.779	0.006	0.006

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; Light-Duty Mix (50% LDA/25% LDT1/25% LDT2); **Fuel Type:** Gasoline.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

VENDOR TRUCKS (ONSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Onsite Trips	Onsite Trip Length (miles)	Running Emission Factor (g/mile)[1,2] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	-	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	-	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	-	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Utility Construction	4/20/2026	6/13/2026	5	40	2026	2	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Flatwork	6/14/2026	7/10/2026	5	20	2026	6	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	-	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	12	0.10	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

VENDOR TRUCKS (ONSITE)

								Non-Running Emission Factor (g/trip)[1,3]												
Phase Name	**Start Date**	**End Date**	**Workdays per Week**	**Total Workdays**	**EF Year**	**Daily Onsite Trips**	**Onsite Trip Length (miles)**	**ROG**	**NO_X**	**CO**	**SO_X**	**PM_{10} Fugitive**	**PM_{10} Exhaust**	**PM_{10} Total**	**$PM_{2.5}$ Fugitive**	**$PM_{2.5}$ Exhaust**	**$PM_{2.5}$ Total**	**CO_2**	**CH_4**	**N_2O**
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	-	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	-	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	-	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Utility Construction	4/20/2026	6/13/2026	5	40	2026	2	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Flatwork	6/14/2026	7/10/2026	5	20	2026	6	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	-	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	12	0.10	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

VENDOR TRUCKS (ONSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Onsite Trips	Onsite Trip Length (miles)	Daily Emissions (lb/day)[4] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	2026	2	0.10	0.001	0.024	0.013	0.000	0.066	0.000	0.066	0.007	0.000	0.007	3.176	0.000	0.001
Flatwork	6/14/2026	7/10/2026	5	20	2026	6	0.10	0.003	0.071	0.039	0.000	0.199	0.000	0.199	0.020	0.000	0.020	9.528	0.000	0.002
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	12	0.10	0.005	0.142	0.078	0.000	0.398	0.000	0.398	0.040	0.000	0.040	19.056	0.000	0.003

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

VENDOR TRUCKS (OFFSITE)

								Running Emission Factor (g/mile)[1,2]												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Vendor One-Way Trips per Day (In/Out)	Vendor Trip Length (miles)	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	-	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	-	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	-	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Utility Construction	4/20/2026	6/13/2026	5	40	2026	4	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Flatwork	6/14/2026	7/10/2026	5	20	2026	12	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	-	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	24	10.2	0.013	1.199	0.064	0.012	0.948	0.018	0.966	0.239	0.017	0.256	1304.041	0.001	0.205

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

VENDOR TRUCKS (OFFSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Vendor One-Way Trips per Day (In/Out)	Vendor Trip Length (miles)	Non-Running Emission Factor (g/trip)[1,3] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	-	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	-	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	-	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Utility Construction	4/20/2026	6/13/2026	5	40	2026	4	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Flatwork	6/14/2026	7/10/2026	5	20	2026	12	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	-	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	24	10.2	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

VENDOR TRUCKS (OFFSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Vendor One-Way Trips per Day (In/Out)	Vendor Trip Length (miles)	Daily Emissions (lb/day) ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	-	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	-	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	-	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Utility Construction	4/20/2026	6/13/2026	5	40	2026	4	10.2	0.003	0.151	0.031	0.001	0.085	0.002	0.087	0.022	0.002	0.023	121.600	0.000	0.019
Flatwork	6/14/2026	7/10/2026	5	20	2026	12	10.2	0.008	0.452	0.094	0.003	0.256	0.005	0.261	0.065	0.005	0.069	364.799	0.000	0.057
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	-	10.2	-	-	-	-	-	-	-	-	-	-	-	-	-
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	24	10.2	0.017	0.904	0.187	0.007	0.512	0.010	0.521	0.129	0.009	0.138	729.598	0.001	0.115

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

HAUL TRUCKS (ONSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Onsite Trips	Onsite Trip Length (miles)	Running Emission Factor (g/mile)[1,2] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	4	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	9	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	66	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Utility Construction	4/20/2026	6/13/2026	5	40	2026	2	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Flatwork	6/14/2026	7/10/2026	5	20	2026	4	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	12	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	-	0.10	0.076	7.935	0.690	0.025	150.333	0.012	150.346	15.010	0.012	15.021	2674.168	0.004	0.421

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; 100% HHDT; **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

HAUL TRUCKS (ONSITE)

								Non-Running Emission Factor (g/trip)[1,3]												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Onsite Trips	Onsite Trip Length (miles)	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	4	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	9	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	66	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Utility Construction	4/20/2026	6/13/2026	5	40	2026	2	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Flatwork	6/14/2026	7/10/2026	5	20	2026	4	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	12	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	-	0.10	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; 100% HHDT; **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

HAUL TRUCKS (ONSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Onsite Trips	Onsite Trip Length (miles)	Daily Emissions (lb/day)[4] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	4	0.10	0.003	0.070	0.046	0.000	0.133	0.000	0.133	0.013	0.000	0.013	9.414	0.000	0.001
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	9	0.10	0.007	0.157	0.104	0.000	0.298	0.000	0.298	0.030	0.000	0.030	21.182	0.000	0.003
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	66	0.10	0.052	1.151	0.761	0.001	2.187	0.000	2.188	0.218	0.000	0.219	155.332	0.002	0.024
Utility Construction	4/20/2026	6/13/2026	5	40	2026	2	0.10	0.002	0.035	0.023	0.000	0.066	0.000	0.066	0.007	0.000	0.007	4.707	0.000	0.001
Flatwork	6/14/2026	7/10/2026	5	20	2026	4	0.10	0.003	0.070	0.046	0.000	0.133	0.000	0.133	0.013	0.000	0.013	9.414	0.000	0.001
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	12	0.10	0.010	0.209	0.138	0.000	0.398	0.000	0.398	0.040	0.000	0.040	28.242	0.000	0.004
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	-	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; 100% HHDT; **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

HAUL TRUCKS (OFFSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Haul One-Way Trips per Day (In/Out)	Haul Trip Length (miles)	Running Emission Factor (g/mile)[1,2] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	8	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	18	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	132	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Utility Construction	4/20/2026	6/13/2026	5	40	2026	4	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Flatwork	6/14/2026	7/10/2026	5	20	2026	8	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	24	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	-	20	0.013	1.628	0.064	0.015	0.977	0.026	1.003	0.248	0.025	0.273	1532.299	0.001	0.241

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; 100% HHDT; **Fuel Type:** Diesel.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

HAUL TRUCKS (OFFSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Haul One-Way Trips per Day (In/Out)	Haul Trip Length (miles)	Non-Running Emission Factor (g/trip)[1,3] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	8	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	18	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	132	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Utility Construction	4/20/2026	6/13/2026	5	40	2026	4	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Flatwork	6/14/2026	7/10/2026	5	20	2026	8	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	24	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	-	20	0.353	7.117	5.160	0.008	-	0.002	0.002	-	0.002	0.002	800.119	0.016	0.126

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; 100% HHDT; **Fuel Type:** Diesel.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

HAUL TRUCKS (OFFSITE)

								Daily Emissions (lb/day)												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Haul One-Way Trips per Day (In/Out)	Haul Trip Length (miles)	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	8	20	0.011	0.700	0.113	0.005	0.345	0.009	0.354	0.088	0.009	0.096	554.615	0.000	0.087
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	18	20	0.024	1.575	0.255	0.012	0.775	0.021	0.796	0.197	0.020	0.217	1247.883	0.001	0.197
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	132	20	0.176	11.548	1.872	0.087	5.686	0.154	5.841	1.444	0.148	1.592	9151.143	0.008	1.442
Utility Construction	4/20/2026	6/13/2026	5	40	2026	4	20	0.005	0.350	0.057	0.003	0.172	0.005	0.177	0.044	0.004	0.048	277.307	0.000	0.044
Flatwork	6/14/2026	7/10/2026	5	20	2026	8	20	0.011	0.700	0.113	0.005	0.345	0.009	0.354	0.088	0.009	0.096	554.615	0.000	0.087
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	24	20	0.032	2.100	0.340	0.016	1.034	0.028	1.062	0.263	0.027	0.289	1663.844	0.001	0.262
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	-	20	-	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; 100% HHDT; **Fuel Type:** Diesel.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

WATER TRUCKS (ONSITE)

								Running Emission Factor (g/mile)[1,2]												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Water Truck Trips	Onsite Trip Length (miles)	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Utility Construction	4/20/2026	6/13/2026	5	40	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Flatwork	6/14/2026	7/10/2026	5	20	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	3	1.0	0.094	5.184	0.503	0.022	150.283	0.018	150.301	14.993	0.018	15.011	2323.706	0.004	0.366

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

WATER TRUCKS (ONSITE)

								Non-Running Emission Factor (g/trip)[1,3]												
Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Water Truck Trips	Onsite Trip Length (miles)	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Utility Construction	4/20/2026	6/13/2026	5	40	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Flatwork	6/14/2026	7/10/2026	5	20	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	3	1.0	0.185	4.857	2.880	0.005	-	0.002	0.002	-	0.002	0.002	487.936	0.009	0.077

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

WATER TRUCKS (ONSITE)

Phase Name	Start Date	End Date	Workdays per Week	Total Workdays	EF Year	Daily Water Truck Trips	Onsite Trip Length (miles)	Daily Emissions (lb/day)[4] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Asphalt Demo	2/16/2026	2/22/2026	5	5	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Roadway Excavation	2/23/2026	3/22/2026	5	20	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Imported Borrow	3/23/2026	4/19/2026	5	20	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Utility Construction	4/20/2026	6/13/2026	5	40	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Flatwork	6/14/2026	7/10/2026	5	20	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Aggregate Base	6/27/2026	7/19/2026	5	15	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003
Asphalt Paving	7/21/2026	8/3/2026	5	10	2026	3	1.0	0.002	0.066	0.022	0.000	0.994	0.000	0.994	0.099	0.000	0.099	18.596	0.000	0.003

Notes:

1. Emission factors generated from EMFAC2021. **Region:** SCAQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** All Speeds; Heavy Duty-Mix (50% MHDT/50% HHDT); **Fuel Type:** Diesel; **Onsite Speed:** 10 MPH.

2. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from unpaved roads.

3. Non-Running emission factors account for additional exhaust and evaporative processes. Exhaust: Engine starting and idling. Evaporative (ROG Only): Runloss, Restloss, Diurnal, and Hotsoak.

4. Emissions account for dust control reduction from water application to unpaved roads 3 times per day.

ARCHITECTURAL COATINGS-ONSITE

							Parking Lot				
Phase Name	**Start Date**	**End Date**	**Workdays per Week**	**Total Workdays**	**Coating Type**	**Coating Area (SF)**	**Parking EF**	**% of Parking Area Painted**	**Parking Area**	**Total ROG Emissions (lbs)**	**Daily ROG Emissions (lb/day)**
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	Non-Residential		100	6%	0.00	0.00	0.00
Asphalt Demo	2/16/2026	2/22/2026	5	5	Non-Residential		100	6%	0.00	0.00	0.00
Roadway Excavation	2/23/2026	3/22/2026	5	20	Non-Residential		100	6%	0.00	0.00	0.00
Imported Borrow	3/23/2026	4/19/2026	5	20	Non-Residential		100	6%	0.00	0.00	0.00
Utility Construction	4/20/2026	6/13/2026	5	40	Non-Residential		100	6%	0.00	0.00	0.00
Flatwork	6/14/2026	7/10/2026	5	20	Non-Residential		100	6%	0.00	0.00	0.00
Aggregate Base	6/27/2026	7/19/2026	5	15	Non-Residential		100	6%	0.00	0.00	0.00
Asphalt Paving	7/21/2026	8/3/2026	5	10	Parking	579348	100	6%	34,760.88	161.00	16.10

Note:
Architectural coatings account for roadway striping

PAVING OFF-GASSING-ONSITE

Phase Name	Start Date	End Date	# of Workdays per Week	# of Workdays	Paved Area (SF)	Paved Area (Acres)	Paved Area (Acres)/day	Off-Gassing EF (lb/acre)[1]	Daily ROG Emissions (lbs)
Clearing and Grubbing	2/2/2026	2/15/2026	5	10	0	0.00	0.00	2.62	0.00
Asphalt Demo	2/16/2026	2/22/2026	5	5	0	0.00	0.00	2.62	0.00
Roadway Excavation	2/23/2026	3/22/2026	5	20	0	0.00	0.00	2.62	0.00
Imported Borrow	3/23/2026	4/19/2026	5	20	0	0.00	0.00	2.62	0.00
Utility Construction	4/20/2026	6/13/2026	5	40	0	0.00	0.00	2.62	0.00
Flatwork	6/14/2026	7/10/2026	5	20	0	0.00	0.00	2.62	0.00
Aggregate Base	6/27/2026	7/19/2026	5	15	0	0.00	0.00	2.62	0.00
Asphalt Paving	7/21/2026	8/3/2026	5	10	0	13.30	1.33	2.62	3.48

Notes:
1. Emission factor based on CalEEMod default value.

Appendix B: Operational Emissions Inventory Documentation

Mobile Emissions Summary

Scenario/Analysis Year	Calendar Year	Vehicle Type	Fuel Type	Annual VMT (miles/year)[1]	Annual Emissions (tons/year) ROG	NO_X	CO	SO_X	PM_{10} Total	$PM_{2.5}$ Total	Annual Emissions (MT/year) CO_2	CH_4	N_2O	CO_2e
Existing (2021)	2021	EMFAC Fleet Mix	All Fuel Types	48,620,419	2	14	56	0.20	49	13	18,344	0.81	0.86	18,620
Opening Year (2026) No-Build	2026	EMFAC Fleet Mix	All Fuel Types	53,327,018	1	9	44	0.19	54	14	17,883	0.76	0.80	18,142
Opening Year (2026) Build	2026	EMFAC Fleet Mix	All Fuel Types	53,322,023	1	9	44	0.19	54	14	17,882	0.76	0.80	18,140
Horizon Year (2046) No-Build	2046	EMFAC Fleet Mix	All Fuel Types	76,214,018	1	11	46	0.21	77	20	21,845	1.01	1.01	22,170
Horizon Year (2046) Build	2046	EMFAC Fleet Mix	All Fuel Types	76,212,319	1	11	46	0.21	77	20	21,844	1.01	1.01	22,170

NET EMISSIONS COMPARISON TO EXISTING CONDITIONS	Annual Emissions (tons/year) ROG	NO_X	CO	SO_X	PM_{10} Total	$PM_{2.5}$ Total	Annual Emissions (MT/year) CO_2	CH_4	N_2O	CO_2e
Opening Year (2026) Build	-1	-5	-12	0	5	1	-462	0	0	-480
Horizon Year (2046) Build	-1	-3	-10	0	28	7	3,500	0	0	3,550

NET EMISSIONS COMPARISON TO NO-BUILD CONDITIONS	Annual Emissions (tons/year) ROG	NO_X	CO	SO_X	PM_{10} Total	$PM_{2.5}$ Total	Annual Emissions (MT/year) CO_2	CH_4	N_2O	CO_2e
Opening Year (2026) Build	-0.00012	-0.00085	-0.00416	-0.00002	-0.00505	-0.00129	-1.67509	-0.00007	-0.00008	-1.69932
Horizon Year (2046) Build	-0.02530	-0.00024	-0.00103	-0.000005	-0.00172	-0.00044	-0.48698	-0.00002	-0.00002	-0.49423

Notes:

1. VMT values provided from Project Traffic Analysis.

Mobile Emissions

Scenario	Calendar Year	Vehicle Type	Fuel Type	Annual VMT (miles/year)[1]	Running Emission Factor (g/mile)[2,3] ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O
Existing (2021)	2021	EMFAC Fleet Mix	All Fuel Types	48,620,419	0.035	0.258	1.051	0.004	0.914	0.005	0.919	0.232	0.004	0.236	377.291	0.017	0.018
Opening Year (2026) No-Build	2026	EMFAC Fleet Mix	All Fuel Types	53,327,018	0.022	0.155	0.756	0.003	0.914	0.002	0.917	0.232	0.002	0.234	335.353	0.014	0.015
Opening Year (2026) Build	2026	EMFAC Fleet Mix	All Fuel Types	53,322,023	0.022	0.155	0.756	0.003	0.914	0.002	0.917	0.232	0.002	0.234	335.353	0.014	0.015
Horizon Year (2046) No-Build	2046	EMFAC Fleet Mix	All Fuel Types	76,214,018	0.015	0.128	0.548	0.003	0.915	0.002	0.917	0.232	0.001	0.234	286.624	0.013	0.013
Horizon Year (2046) Build	2046	EMFAC Fleet Mix	All Fuel Types	76,212,319	0.015	0.128	0.548	0.003	0.915	0.002	0.917	0.232	0.001	0.234	286.624	0.013	0.013

Notes:

1. VMT values provided from Project Traffic Analysis.
2. Emission factors generated from EMFAC2017. **Region:** South Coast AQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; **Vehicle Category:** All Vehicle Types; **Fuel Type:** All fuels.
3. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.
4. GWP values consistent with IPCC AR4.

Mobile Emissions					Annual Emissions (tons/year)										Annual Emissions (MT/year)[4]			
Scenario	Calendar Year	Vehicle Type	Fuel Type	Annual VMT (miles/year)[1]	ROG	NO_X	CO	SO_X	PM_{10} Fugitive	PM_{10} Exhaust	PM_{10} Total	$PM_{2.5}$ Fugitive	$PM_{2.5}$ Exhaust	$PM_{2.5}$ Total	CO_2	CH_4	N_2O	CO_2e
Existing (2021)	2021	EMFAC Fleet Mix	All Fuel Types	48,620,419	1.88	13.83	56.30	0.20	49.00	0.25	49.25	12.43	0.24	12.67	18,344.10	0.81	0.86	18,620.14
Opening Year (2026) No-Build	2026	EMFAC Fleet Mix	All Fuel Types	53,327,018	1.28	9.10	44.43	0.19	53.76	0.14	53.89	13.64	0.13	13.77	17,883.43	0.76	0.80	18,142.09
Opening Year (2026) Build	2026	EMFAC Fleet Mix	All Fuel Types	53,322,023	1.28	9.10	44.42	0.19	53.75	0.14	53.89	13.64	0.13	13.77	17,881.75	0.76	0.80	18,140.39
Horizon Year (2046) No-Build	2046	EMFAC Fleet Mix	All Fuel Types	76,214,018	1.25	10.76	46.08	0.21	76.88	0.13	77.01	19.52	0.12	19.64	21,844.83	1.01	1.01	22,170.28
Horizon Year (2046) Build	2046	EMFAC Fleet Mix	All Fuel Types	76,212,319	1.25	10.76	46.08	0.21	76.88	0.13	77.01	19.52	0.12	19.64	21,844.34	1.01	1.01	22,169.78

Notes:

1. VMT values provided from Project Traffic Analysis.
2. Emission factors generated from EMFAC2017. **Region:** South Coast AQMD; **Season:** Annual; **Vehicle Classification:** EMFAC2007 Categories; **Model Year:** Aggregate; **Speed:** Aggregate; **Vehicle Category:** All Vehicle Types; **Fuel Type:** All fuels.
3. Running emission factors account for exhaust and fugitive dust from brake wear, tire wear, and road dust from paved roads.
4. GWP values consistent with IPCC AR4.

Existing Intersection Volumes-2021

		AM Peak Hour												
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**
1	Roosevelt Street and Markham Street	0	0	0	1	0	10	10	1	0	0	8	1	31
2	Birch Street and Markham Street	0	0	5	0	0	0	0	9	0	4	12	0	30
3	Cedar Street and Markham Street	1	0	9	0	0	0	0	13	1	4	15	0	43
4	Wood Road and Markham Street	2	222	115	46	197	9	15	8	4	161	12	57	848
		PM Peak Hour												
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**
1	Roosevelt Street and Markham Street	0	0	0	4	0	6	9	4	0	0	1	1	25
2	Birch Street and Markham Street	0	0	3	0	0	0	0	10	1	4	5	0	23
3	Cedar Street and Markham Street	0	0	5	0	0	0	0	10	0	7	7	0	29
4	Wood Road and Markham Street	1	226	143	78	238	13	10	2	2	73	2	47	835

Source: Table 2-2, Markham Street Roadway Improvement Project Traffic Impact Assessment Technical Memorandum, HDR, February 2022

Intersection Volumes-2026-No Build

		AM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	1	0	10	10	1	0	0	8	1	31	310
2	Birch Street and Markham Street	0	0	5	0	0	0	0	9	0	4	12	0	30	300
3	Cedar Street and Markham Street	1	0	9	0	0	0	0	14	1	4	16	0	45	450
4	Wood Road and Markham Street	2	238	119	47	201	9	15	8	4	166	12	59	880	8800

		PM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	4	0	6	9	4	0	0	1	1	25	250
2	Birch Street and Markham Street	0	0	3	0	0	0	0	10	1	4	5	0	23	230
3	Cedar Street and Markham Street	0	0	5	0	0	0	0	10	0	7	7	0	29	290
4	Wood Road and Markham Street	1	233	155	96	257	13	10	2	2	75	2	47	893	8930

Source: Markham Street Extension Project Updated Years 2026/2046 Forecasts Technical Memorandum, HDR, November 2022

Intersection Volumes-2046-No Build

		AM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	1	0	12	12	1	0	0	10	1	37	370
2	Birch Street and Markham Street	0	0	6	0	0	0	0	11	0	5	14	0	36	360
3	Cedar Street and Markham Street	1	0	11	0	0	0	0	16	1	5	18	0	52	520
4	Wood Road and Markham Street	3	300	133	53	218	10	15	9	5	187	12	66	1011	10110
		PM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	5	0	7	11	5	0	0	1	1	30	300
2	Birch Street and Markham Street	0	0	4	0	0	0	0	12	1	5	6	0	28	280
3	Cedar Street and Markham Street	0	0	6	0	0	0	0	12	0	8	8	0	34	340
4	Wood Road and Markham Street	1	260	204	169	334	14	12	3	2	84	2	49	1134	11340

Source: Markham Street Extension Project Updated Years 2026/2046 Forecasts Technical Memorandum, HDR, November 2022

Intersection Volumes-2026-Build

		AM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	5	0	10	10	114	0	0	525	5	669	6690
2	Birch Street and Markham Street	0	0	23	0	0	0	0	151	0	11	526	0	711	7110
3	Cedar Street and Markham Street	5	0	15	0	0	0	0	128	41	4	479	0	672	6720
4	Wood Road and Markham Street	43	238	22	6	189	45	61	53	14	85	397	35	1188	11880
		PM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	4	0	6	11	553	0	0	208	6	788	7880
2	Birch Street and Markham Street	0	0	12	0	0	0	0	585	16	12	216	0	841	8410
3	Cedar Street and Markham Street	0	0	19	0	0	0	0	545	0	7	214	0	785	7850
4	Wood Road and Markham Street	54	273	52	5	178	22	54	387	31	26	160	4	1246	12460

Source: Markham Street Extension Project Updated Years 2026/2046 Forecasts Technical Memorandum, HDR, November 2022

Intersection Volumes-2046-Build

		AM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	6	0	12	12	211	0	0	557	6	804	8040
2	Birch Street and Markham Street	0	0	27	0	0	0	0	167	0	14	569	0	777	7770
3	Cedar Street and Markham Street	5	0	18	0	0	0	0	138	41	5	543	0	750	7500
4	Wood Road and Markham Street	65	300	25	7	205	50	61	60	17	96	397	39	1322	13220

		PM Peak Hour													
No.	**Intersection (N/S & E/W)**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**Total**	**Daily Count**
1	Roosevelt Street and Markham Street	0	0	0	4	0	7	14	711	0	0	251	7	994	9940
2	Birch Street and Markham Street	0	0	16	0	0	0	0	644	16	15	258	0	949	9490
3	Cedar Street and Markham Street	0	0	23	0	0	0	0	599	0	8	244	0	874	8740
4	Wood Road and Markham Street	54	305	69	9	231	24	65	580	31	29	160	4	1561	15610

Source: Markham Street Extension Project Updated Years 2026/2046 Forecasts Technical Memorandum, HDR, November 2022

										GENERATED BY EXTRAPOLATING BETWEEN 2012 and 2040 VALUES					
							Horizon Year 2046[b]			**Existing 2021**			**Opening Year 2026**		
VMT Comparison	**Year 2012 No Build[a]**	**Year 2012 Build[a]**	**2012 Build vs 2012 No Build[a]**	**Year 2040 No Build[a]**	**Year 2040 Build[a]**	**2040 Build vs 2040 No Build[a]**	**Year 2046 No Build**	**Year 2046 Build**	**2046 Build vs 2046 No Build**	**Year 2021 No Build**	**Year 2021 Build**	**2021 Build vs 2021 No Build**	**Year 2026 No Build**	**Year 2026 Build**	**2026 Build vs 2026 No Build**
Total Residential VMT	32,037,483	32,030,136	-0.023%	49,805,138	49,802,159	-0.006%	55,724,012	55,722,286	-0.003%						
Total Work VMT	8,111,059	8,110,938	-0.001%	16,700,356	16,700,813	0.003%	20,490,006	20,490,033	0.000%						
Total VMT	***40,148,542***	***40,141,074***	***-0.019%***	***66,505,494***	***66,502,972***	***-0.004%***	***76,214,018***	***76,212,319***	***-0.002%***	***48,620,419***	***48,614,541***	***-0.012%***	***53,327,018***	***53,322,023***	***-0.009%***
Average Residential VMT/Capita	16.5	16.5	0.000%	20.0	20.0	0.000%	21.0	21.0	0.000%						
Average Work VMT/Employee	10.8	10.8	0.000%	12.1	12.1	0.000%	12.0	12.0	0.000%						

	Year	No Build	Build	Build vs No Build
	2012	40,148,542	40,141,074	-0.019%
	2040	66,505,494	66,502,972	-0.004%
Existing Conditions -->	2021	48,620,419	48,614,541	-0.012%
Opening Year-->	2026	53,327,018	53,322,023	-0.009%

[a] Table 5-7, Markham Street Roadway Improvement Project Traffic Impact Assessment Technical Memorandum, HDR, February 2022

[b] Table 11, Markham Street Extension Project Updated Years 2026/2046 Forecasts Technical Memorandum, HDR, November 2022

Level of Service

Roadway Segment	Location	Lane Configuration		Existing 2021		2024NB		2024B		2044NB		2044B	
		Direction	Lanes	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
Markham Street*	West of Roosevelt Street	E/W	3U/4U	0.009	A	0.010	A	0.169	A	0.018	A	0.284	A
Markham Street	Btw Roosevelt Street and Wood Road	E/W	2U	0.039	A	0.039	A	0.554	A	0.043	A	0.602	B
Markham Street	East of Wood Road	E/W	2U/3U	0.229	A	0.229	A	0.408	A	0.233	A	0.415	A
Roosevelt Street	North of Markham Street	N/S	2U	0.010	A	0.010	A	0.013	A	0.011	A	0.014	A
Wood Road	North of Markham Street	N/S	2U	0.486	A	0.490	A	0.371	A	0.519	A	0.393	A
Wood Road	South of Markham Street	N/S	2U/3U	0.513	A	0.523	A	0.460	A	0.588	A	0.517	A
Mariposa Avenue	Btw Roosevelt Street and Wood Road	E/W	2U	0.063	A	0.070	A	0.058	A	0.122	A	0.101	A
Cajalco Road**	Btw Harley John Road and Wood Road	E/W	2U/6U	**1.142**	**F**	**1.362**	**F**	**1.324**	**F**	**0.944**	**E**	**0.918**	**E**

Source: Table 6-1, Markham Street Roadway Improvement Project Traffic Impact Assessment Technical Memorandum, HDR, February 2022

Intersection	Traffic Control	Existing Year 2021				Year 2024 No Build				Year 2024 Build				Year 2044 No Build				Year 2044 Build			
		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
		Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Roosevelt Street and Markham Street	AWSC/TWSC*	6.9	A	7.0	A	6.9	A	7.0	A	11.0	B	10.6	B	6.9	A	7.0	A	11.3	B	11.2	B
Birch Street and Markham Street	TWSC	8.4	A	8.4	A	8.4	A	8.4	A	9.1	A	12.3	B	8.4	A	8.4	A	9.2	A	12.9	B
Cedar Street and Markham Street	TWSC	8.5	A	8.4	A	8.5	A	8.4	A	10.1	B	11.9	B	8.5	A	8.4	A	10.3	B	12.5	B
Wood Road and Markham Street	Traffic Signal	41.4	D	48.3	D	42.2	D	51	D	38.4	D	36.1	D	52.5	D	80.3	F	40.0	D	37.3	D

Source: Table 6-2, Markham Street Roadway Improvement Project Traffic Impact Assessment Technical Memorandum, HDR, February 2022

Intersection Peak Hour Queuing Comparisons

ID	Intersection Movement (NB/SB & EB/WB)		Existing 2021		2024NB		2024B		2044NB		2044B	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
			Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)	Adequate Storage (Yes/No)
1	Roosevelt Street & Markham Street	SB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		EB*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		WB*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	Birch Street & Markham Street	NB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		WB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3	Cedar Street & Markham Street	NB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		WB	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
4	Wood Road & Markham Street	NBL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		NBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		NBR	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		SBL	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		SBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	***No***	Yes	Yes
		EBL	--	--	--	--	Yes	Yes	--	--	Yes	Yes
		EBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		WBL*	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
		WBT	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Table 6-3, Markham Street Roadway Improvement Project Traffic Impact Assessment Technical Memorandum, HDR, February 2022