

APPENDIX 5.3 GP-1: AIR QUALITY AND GREENHOUSE GAS EMISSIONS MODELING

1. Criteria Air Pollutant and GHG Emissions Summaries

This page intentionally left blank.

CITY OF BARSTOW GENERAL PLAN PLANNING AREA - CRITERIA AIR POLLUTANT INVENTORY

EXISTING BASELINE	2023 - lbs/day						2023 - tons/yr					
SECTORS	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Transportation - Onroad ¹	56	880	2,821	14	100	41	10	153	489	2	17	1
Energy - Residential (Natural Gas)	6	98	42	1	8	8	1	18	8	0	1	1
Energy - Nonresidential* (Natural Gas)	3	56	47	0	4	4	1	10	9	0	1	1
Energy - Transportation	0	7	6	0	1	1	0	1	1	0	0	0
Energy - CNG	0	5	4	0	0	0	0	1	1	0	0	0
Energy - Other	0	6	5	0	0	0	0	1	1	0	0	0
<i>Energy sub-total</i> ²	10	173	104	1	14	14	2	32	19	0	2	2
Area Sources (Agricultural Equipment) ³	22	97	299	0	6	5	4	18	54	0	1	1
Area Sources (Construction Equipment) ³	0	1	2	0	0	0	0	0	0	0	0	0
Area Sources (Lawn & Garden Equipment) ³	77	10	857	0	1	1	14	2	156	0	0	0
Area Sources (Light Commercial Equipment) ³	41	50	1,872	0	1	1	8	9	342	0	0	0
<i>Area sub-total</i>	141	158	3,030	0	8	7	26	29	553	0	1	1
Area Sources - Consumer Products ⁴	706	0	0	0	0	0	129	0	0	0	0	0
Total	913	1,210	5,955	15	121	61	166	213	1,061	3	21	5

EXISTING w/2048 EMISSION RATES	2048 Existing Land Uses - lbs/day						2048 Existing Land Uses - tons/yr					
SECTORS	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Transportation - Onroad ¹	17	422	1,306	10	93	35	3	73	227	2	16	1
Energy - Residential (Natural Gas)	6	98	42	1	8	8	1	18	8	0	1	1
Energy - Nonresidential* (Natural Gas)	3	56	47	0	4	4	1	10	9	0	1	1
Energy - Transportation	0	7	6	0	1	1	0	1	1	0	0	0
Energy - CNG	0	5	4	0	0	0	0	1	1	0	0	0
Energy - Other	0	6	5	0	0	0	0	1	1	0	0	0
<i>Energy sub-total</i> ²	10	173	104	1	14	14	2	32	19	0	2	2
Area Sources (Agricultural Equipment) ³	22	97	299	0	6	5	4	18	54	0	1	1
Area Sources (Construction Equipment) ³	0	1	2	0	0	0	0	0	0	0	0	0
Area Sources (Lawn & Garden Equipment) ³	77	10	857	0	1	1	14	2	156	0	0	0
Area Sources (Light Commercial Equipment) ³	41	50	1,872	0	1	1	8	9	342	0	0	0
<i>Area sub-total</i>	141	158	3,030	0	8	7	26	29	553	0	1	1
Area Sources - Consumer Products ⁴	706	0	0	0	0	0	129	0	0	0	0	0
Total	874	752	4,440	11	115	56	159	133	799	2	20	5
Net Change from Baseline (2023)	-39	-458	-1,515	-4	-7	-5	-7	-79	-263	-1	-1	0

FORECAST YEAR 2048	2048 Land Uses - lbs/day						2048 Land Uses - tons/yr					
SECTORS	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Transportation - Onroad ¹	29	946	2,006	18	185	73	5	164	348	3	32	3
Energy - Residential (Natural Gas)	9	149	64	0.95	12	12	2	27	12	0.17	2	2
Energy - Nonresidential* (Natural Gas)	5	89	75	0.53	7	7	1	16	14	0.10	1	1
Energy - Transportation	0	7	6	0.04	1	1	0	1	1	0.01	0	0
Energy - CNG	0	5	4	0.03	0	0	0	1	1	0.01	0	0
Energy - Other	0	6	5	0.03	0	0	0	1	1	0.01	0	0
<i>Energy sub-total</i> ²	15	257	154	2	20	20	3	47	28	0	4	4
Area Sources (Agricultural Equipment) ³	0	1	2	0	0	0	0	0	0	0	0	0
Area Sources (Construction Equipment) ³	0	2	4	0	0	0	0	0	1	0	0	0
Area Sources (Lawn & Garden Equipment) ³	118	15	1,310	0	1	1	22	3	239	0	0	0
Area Sources (Light Commercial Equipment) ³	57	70	2,595	0	1	1	10	13	474	0	0	0
<i>Area sub-total</i>	176	87	3,910	0	3	2	32	16	714	0	1	0
Area Sources - Consumer Products ⁴	1,365	0	0	0	0	0	249	0	0	0	0	0
<i>GP Subtotal</i>	1,584	1,289	6,070	20	208	95	289	227	1,090	3	36	7
Rail - BIG	2,086	58,695	18,277	65	1,052	1,020	337	9,480	2,988	11	170	165
Area Sources (Architectural Coatings) - BIG Project	58	0	0	0	0	0	11	0	0	0	0	0
Area Sources (Degreaser on Parking Surfaces) - BIG Project	0	0	0	0	0	0	0.002	0	0	0	0	0
Area Sources (Consumer Products) - BIG Project	196	0	0	0	0	0	36	0	0	0	0	0
Area Sources (Landscaping Equipment) - BIG Project	2	1	72	0.003	0.003	0.003	0.1644	0.0558	6	0.0003	0.0003	0.0003
Area Sources (Off-Road Equipment) - BIG Project	156	558	2,286	3	19	19	15	44	376	1	1	1
<i>BIG Subtotal</i>	2,498	59,254	20,635	68	1,071	1,039	399	9,524	3,370	11	171	166
Existing Barstow Yard Switcher Replacement	-131	-821	-53	0	-39	-38	-24	-150	-10	0	-7	-7
TMT Reduction - MDAB	-1	-122	-16	-1	-108	-30	0	-22	-3	0	-20	-5
Mainline - Without BIG	-53	-1,704	-529	-2	-31	-30	-9	-275	-85	-0.30	-5	-5
Rail Corridor - Without BIG	-1,919	-53,861	-16,700	-59	-969	-940	-310	-8,699	-2,697	-10	-157	-152
<i>BIG Net Subtotal</i>	394	2,746	3,337	6	-76	2	56	378	575	1	-17	-3
Total	1,978	4,035	9,408	26	132	97	345	605	1,665	4	19	4
Net Change from Baseline (2023 Existing)	1,065	2,825	3,452	11	11	36	179	392	604	2	-2	-1
Net Change from Baseline (2048 Existing)	1,105	3,284	4,968	15	17	41	186	471	866	2	-1	-1
MDAQMD Thresholds	137	137	548	137	82	65	25	25	100	25	15	12
Exceeds Thresholds?	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	No	No	No

Notes:

¹ Existing and year 2028 emissions based on calendar year 2023 and 2048 EMFAC2021, Version 1.0.2, emissions data, respectively, and vehicle miles traveled (VMT) data provided by Fehr&Peers. VMT data provided by Fehr & Peers using the San Bernardino Transportation Analysis Model (SBTAM+) and origin-destination approach. The VMT provided includes the full trip length for land uses in the City and SOI (origin-destination approach) and a 50 percent reduction in the trip length for external-internal/internal-external trips, consistent with the recommendations of CARB's Regional Targets Advisory Committee. Daily VMT from the SBTAM+ is converted to annual VMT by multiplying the daily VMT by 347 days per year, which is consistent with CARB assumptions to account for less travel on weekend.

² Based on natural gas usage data provided by Southwest Gas and emission rates from the California Emissions Estimator Model, Version 2022.1, for natural gas. Forecast emissions based on a household growth adjustment factor for residential natural gas demand and a building square footage growth adjustment factor for nonresidential natural gas usage.

³ Based on OFFROAD, Version 1.1.0, calendar year 2023 emissions data.

⁴ Area sources (i.e., VOCs) generated from use of consumer products and cleaning supplies are based the California Emissions Estimator Mode, Version 2022.1, default emission rates, which are applied to residential and non-residential land uses in the City and SOI

CITY OF BARSTOW GENERAL PLAN PLANNING AREA - COMMUNITY GHG EMISSIONS INVENTORY (In California)

SECTORS	MTCO ₂ e			
	2023	Percent of Total	2048	Percent of Total
Transportation - On-Road (City, BIG, & SOI) ¹	232,465	71%	300,266	65%
Residential (Natural Gas and Electricity) ²	34,168	10%	31,486	7%
Nonresidential* (Natural Gas and Electricity) ²	28,532	9%	21,229	5%
Solid Waste (Waste Commitment) - City, BIG, & SOI ³	8,984	3%	17,958	4%
Water/Wastewater (Entire General Plan Plan Area) ⁴	1,772	1%	570	0%
Other - Offroad Equipment (City & SOI) ⁵	4,732	1%	3,360	1%
Refrigerants ⁶	15,460	5%	23,812	5%
<i>Community Subtotal</i>	<i>326,114</i>	<i>100%</i>	<i>398,681</i>	<i>87%</i>
Big: Nonresidential (Electricity, No Natural Gas)	n/a	n/a	0	
BIG: Other - Offroad Equipment (Excludes landscaping equipment)	n/a	n/a	53,715	
BIG: Landscaping Equipment	n/a		21	
BIG: Construction (30-year amortized)	n/a	n/a	7,808	
Rail	n/a	n/a	61,049	
BIG: Refrigerants	n/a	n/a	40,372	
<i>BIG Subtotal</i>	<i>n/a</i>	<i>n/a</i>	<i>162,965</i>	
Existing Barstow Yard Switcher Replacement	n/a	n/a	(522)	
TMT Reduction - California	n/a	n/a	(100,539)	
<i>BIG Net Subtotal</i>	<i>n/a</i>	<i>n/a</i>	<i>61,904</i>	<i>13%</i>
Total Community+BIG Project Emissions	326,114	100%	460,585	100%
Service Population	48,626		78,068	
MTCO ₂ e/SP	6.71		5.90	
Trajectory to AB 32, SB 32 and AB 1279	48,917	85.00%	No	<-Achieve Target?

Notes: Based on IPCC's Fifth Assessment Report GWPs

¹ Existing and year 2048 emissions based on calendar year 2023 and 2048 EMFAC2021, Version 1.0.2, emissions data, respectively, and vehicle miles traveled (VMT) data provided by Fehr&Peers. VMT data provided by Fehr & Peers using the San Bernardino Transportation Analysis Model (SBTAM+) and origin-destination approach. The VMT provided includes the full trip length for land uses in the City and SOI (origin-destination approach). Daily VMT from the SBTAM+ is converted to annual VMT by multiplying the daily VMT by 347 days per year, which is consistent with CARB assumptions to account for less travel on weekend.

² Based on natural gas usage data provided by Southwest Gas and intensity factors for CO₂, CH₄, and NO₂ from the California Emissions Estimator Model, Version 2022.1, for natural gas and on electricity usage data provided by Southern California Edison and a CO₂e intensity factor of 374 lbs/MWh as reported in the SCE 2023 Sustainability Report for baseline year 2023. Horizon year 2048 assumes a carbon intensity of zero based on the presumed compliance with the RPS targets. Forecast emissions based on a household growth adjustment factor for residential natural gas and electricity demand and a building square footage growth adjustment factor for nonresidential natural gas and electricity usage.

³ Waste. Landfill Emissions Tool Version 1.9 and CalRecycle. Baseline year waste generation based on four-year average (2020-2023) waste commitment for the City of Barstow obtained from CalRecycle and adjusted to include solid waste from the SOI. Proposed project horizon year 2048 waste generation based on the assumed baseline year waste generation plus the incremental increase. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. Emissions results of the Landfill Emissions Tool v.1.9, which are based on AR4 GWPs, are adjusted to be based on AR5 GWPs. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.1. Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Consequently, the highest CH₄ emissions from waste disposal in a given year are reported and have been adjusted to utilize IPCC's Fourth Assessment global warming potential assigned for CH₄.

⁴ GHG emissions from this sector include indirect GHG emissions from the embodied energy associated with water use and wastewater generation and fugitive GHG emissions from processing wastewater. Water demand and wastewater generation is based on data provided by the Mojave Water Agency and City of Barstow (see Section 5.17, *Utilities and Service Systems*). Electricity use from water use is estimated using energy rates identified by in the 2022 CalEEMod Users Guide (CAPCOA 2022). Then energy is multiplied by the carbon intensity of energy. Wastewater treatment also results in direct CH₄ emissions from wastewater processing, which are based on the emission rates identified in the 2022 CalEEMod Users Guide

⁵ Based on OFFROAD, Version 1.1.0, calendar year 2023 emissions data.

⁶ Refrigerants are based on the CARB's statewide 2021 refrigerant use and statewide population based on the 2021 census data in order to derive emissions per person. The CARB statewide 2021 refrigerant use CO₂e emissions, which are based on AR4 GWPs, were adjusted to AR5 GWPs.

Industrial Sector are "point" sources that are permitted by MDAQMD and are not under the jurisdiction of the City of Barstow; and therefore, not included in the City of Barstow's community GHG emissions inventory.

CITY OF BARSTOW GENERAL PLAN PLANNING AREA - GHG EMISSIONS INVENTORY COMPARISON

SECTORS	Substantial Increase			
	Change from 2023 MTCO ₂ e			
	Year 2023	Horizon Year 2048	2048 Buildout	Percent Change from 2023
<i>Transportation - On-Road</i>	<i>232,465</i>	<i>300,266</i>	<i>67,801</i>	<i>29%</i>
<i>Residential (Natural Gas and Electricity)</i>	<i>34,168</i>	<i>31,486</i>	<i>(2,682)</i>	<i>-7.8%</i>
<i>Nonresidential* (Natural Gas and Electricity)</i>	<i>28,532</i>	<i>21,229</i>	<i>(7,303)</i>	<i>-25.6%</i>
<i>Waste</i>	<i>8,984</i>	<i>17,958</i>	<i>8,974</i>	<i>99.9%</i>
<i>Water/Wastewater</i>	<i>1,772</i>	<i>570</i>	<i>(1,202)</i>	<i>-67.8%</i>
<i>Other - Offroad Equipment</i>	<i>4,732</i>	<i>3,360</i>	<i>(1,372)</i>	<i>-29.0%</i>
<i>Refrigerants</i>	<i>15,460</i>	<i>23,812</i>	<i>8,352</i>	<i>54.0%</i>
<i>Community Subtotal</i>	<i>326,114</i>	<i>398,681</i>	<i>72,567</i>	<i>22.3%</i>
Rail	n/a	61,904	61,904	n/a
Total Community Emissions	326,114	460,585	134,471	41%

2. Criteria Air Pollutant and GHG Modeling Inputs and Assumptions Summary

This page intentionally left blank.

Modeling Inputs

	Baseline Year 2023				Proposed GP Year 2048				Change from Baseline Year			
	City	BIG	Remaining SOI	Total	City	BIG	Remaining SOI	Total	City	BIG	Remaining SOI	Total
Households	8,769	108	3,109	11,986	15,170	0	3,144	18,314	6,401	(108)	35	6,328
Non-Residential Square Footage	10,157,592	0	913,999	11,071,591	16,592,514	9,000,000	820,275	26,412,789	6,434,922	9,000,000	(93,724)	15,341,198
Population	24,867	325	9,110	34,302	43,618	0	9,215	52,833	18,751	(325)	105	18,531
Employment	13,560	0	764	14,324	19,098	5,373	764	25,235	5,538	5,373	0	10,911
Service Population	38,427	325	9,874	48,626	62,716	5,373	9,979	78,068	24,289	5,048	105	29,442

Growth Rates from Baseline

Housing Growth Rate
Non-Residential Sq Ft Growth Rate
Population Growth Rate
Employment Growth Rate
Service Population Growth Rate

Existing - City	Existing - BIG	Existing - City+BIG	Existing - SOI	2048 - City	2048 - BIG	2048 - City+BIG	2048 - City+SOI	2048 - SOI	2048 - Combined
1.00	1.00	1.00	1.00	1.73	(1.00)	1.71	1.54	1.01	1.53
1.00	0	1.00	1.00	1.63		2.52	1.57	0.90	2.39
1.00	1.00	1.00	1.00	1.75	(1.00)	1.73	1.55	1.01	1.54
1.00	0	1.00	1.00	1.41		1.80	1.39	1.00	1.76
1.00	1.00	1.00	1.00	1.63	15.53	1.76	1.51	1.01	1.61

	City+BIG+SOI	Proposed GP
ELECTRICITY ¹	2023	2048
City & BIG		
Residential Electricity (kWh) (City & BIG)	58,919,082	100,687,448
Nonresidential Electricity (kWh) (City)	74,133,529	121,097,758
Nonresidential Electricity (kWh) (BIG) ²	0	84,378,000
Remaining SOI		
Residential Electricity (kWh)	20,889,432	21,124,597
Nonresidential Electricity (kWh)	6,670,673	5,986,643
Total Electricity (kWh)	160,612,715	333,274,446
NATURAL GAS ¹	2023	2048
City & BIG		
Residential Natural Gas (Therms) (City & BIG)	2,861,769	4,890,508
Nonresidential Natural Gas (Therms) (City)	1,927,933	3,149,295
Transportation (Therms)	275,650	275,650
CNG (Therms)	193,628	193,628
Other (Therms)	214,886	214,886
Remaining SOI		
Residential Natural Gas (Therms)	1,014,624	1,026,047
Nonresidential Natural Gas (Therms)	173,479	155,690
Total Natural Gas (Therms)	6,661,970	9,905,704
TRANSPORTATION ²	2023	2048
City, SOI, & BIG		
VMT/Day	1,339,563	2,177,250
WATER ³	2023	2048
City, SOI, & BIG		
Water (gallons/day)	4,833,314	6,925,905
Total Water Demand	4,833,314	6,925,905
WASTEWATER ³	2023	2048
City, SOI, & BIG		
Indoor Water as a Percent of Total Water Use	55%	86%
Wastewater (gallons/day)	2,650,000	5,930,000
SOLID WASTE ⁴	2023	2048
City & BIG		
Waste Generation (tons/year)	28,331	63,893
Remaining SOI		
Waste Generation (tons/year)	7,280	7,357
Waste Generation ADC (tons/year)		
Total Waste Disposal (tons/year)	35,611	71,250

Sources:

¹ Non-BIG project energy use generally utilizes a five-year (2019-2023) average annual electricity and natural gas consumption based on data provided by Southern California Edison (SCE) Southwest Gas, respectively. Forecasts in energy are based on the change in population for residential energy use and employment for non-residential energy use.

² VMT provided by Fehr and Peers and adjusted for Population and Employment. Adjusted daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement.

³ Total water demand and wastewater generation based on data provided by Mojave Water Agency and City of Barstow, respectively.

⁴ Baseline year waste generation based on four-year 2020-2023 average waste commitment for the City of Barstow obtained from CalRecycle. Project horizon waste generation represent the baseline year plus the incremental project increase. The project increase in waste generation based on residential rate of 12.23 pounds per household per day and non-residential rate of 10.53 pounds per employee per day.

3. Mobile-Source Emissions Calculations

This page intentionally left blank.

Table A: Barstow SOI Daily VMT by Vehicle Class (RTAC Methodology)

Juristinction		Auto		LHDT		MHDT		HHDT		Total VMT		RTAC VMT	
		i	x	i	x	i	x	i	x	i	x	100% ii +50% ix & xi	
Existing	i	286,432	410,360	2,568	7,664	2,280	6,243	1,508	83,117	292,788	507,384	816,175	
	x	442,771	-	7,656	-	6,236	-	82,728	-	539,392	-		
Current GP	i	507,433	657,120	4,711	14,410	4,248	11,176	2,329	125,178	518,722	807,884	1,364,017	
	x	731,795	-	14,494	-	11,251	-	125,166	-	882,706	-		
Proposed GP	i	426,561	600,278	7,772	14,317	8,093	12,462	8,248	192,195	450,673	819,252	1,313,961	
	x	688,256	-	14,403	-	12,550	-	192,115	-	907,325	-		

Source: Fehr & Peers, 2025

Vehicle Category	Existing		Current GP		Proposed GP		Net Change	
	VMT	Percent	VMT	Percent	VMT	Percent	VMT	Percent
Auto	1,139,563	85.07%	1,896,349	85.83%	1,715,095	78.77%	575,532	50.50%
LHDT	17,888	1.34%	33,615	1.52%	36,492	1.68%	18,604	104.00%
MHDT	14,759	1.10%	26,675	1.21%	33,105	1.52%	18,346	124.30%
HHDT	167,353	12.49%	252,673	11.44%	392,557	18.03%	225,205	134.57%
Total	1,339,563	100.00%	2,209,312	100.00%	2,177,250	100.00%	837,687	62.53%

City of Barstow & SOI — TRANSPORTATION SECTOR

CRITERIA AIR POLLUTANTS						
	lbs/day					
	ROG	NOx	CO	SOx	PM10	PM2.5
Year 2023						
Total	56	880	2,821	14	100	41
Year 2048						
Total	29	946	2,006	18	185	73
Baseline in 2048						
Total	17	422	1,306	10	93	35
Annual Criteria Air Pollutant Emissions						
	Tons/year					
	ROG	NOx	CO	SOx	PM10	PM2.5
Year 2023	10	153	489	2	17	1
Year 2048	5	164	348	3	32	3
Baseline in 2048	3	73	227	2	16	1
Source: EMFAC2021, Version 1.0.2., San Bernardino County						

GHG EMISSIONS				
	MTons/year			
	N ₂ O	CO ₂	CH ₄	CO ₂ e
Year 2023				
Total	18	227,487	7	232,465
Year 2048				
Total	26	293,332	3	300,266
Source: EMFAC2021, Version 1.0.2.				
Note: MTons = metric tons; CO ₂ e = carbon dioxide-equivalent.				

Source: EMFAC2021 v1.0.2 Web Database, <https://arb.ca.gov/emfac/emissions-inventory/ac1904f619dde9381b90bd72b3a629ed18799ae4>. Based on the Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (AR5) Global Warming Potentials (GWPs)

Note: MTons = metric tons; CO₂e = carbon dioxide-equivalent.

Year 2023 Existing: Criteria Air Pollutants - Daily Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	12.5%	1.1%	1.34%	85.07%
EMFAC Default	6.69%	1.48%	3.58%	88.25%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this anlsys: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this anlsys: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this anlsys: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this anlsys: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	1,339,563
-----------	-----------

Source: Fehr & Peers, 2025

Emission year										
Year 2023						lbs/day				
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.12	2.16	0.35	0.01	0.12	0.08
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.02	0.36	0.00	0.01	0.00
LDA	Gasoline	Aggregated	47.36%	45.65%	13.44	61.46	1,084.23	3.85	21.62	7.50
LDA	Diesel	Aggregated	0.11%	0.11%	0.10	0.76	1.09	0.01	0.11	0.07
LDA	Electricity	Aggregated	1.81%	1.75%	0.00	0.00	0.00	0.00	0.64	0.18
LDA	Plug-in Hybrid	Aggregated	1.36%	1.31%	0.05	0.12	8.66	0.05	0.48	0.15
LDT1	Gasoline	Aggregated	3.59%	3.46%	4.76	22.09	222.34	0.35	1.89	0.72
LDT1	Diesel	Aggregated	0.00%	0.00%	0.01	0.03	0.03	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
LDT2	Gasoline	Aggregated	18.85%	18.17%	7.40	46.16	523.40	1.89	9.14	3.18
LDT2	Diesel	Aggregated	0.06%	0.05%	0.02	0.10	0.20	0.00	0.04	0.02
LDT2	Electricity	Aggregated	0.07%	0.07%	0.00	0.00	0.00	0.00	0.02	0.01
LDT2	Plug-in Hybrid	Aggregated	0.15%	0.15%	0.01	0.01	0.92	0.01	0.05	0.02
LHD1	Gasoline	Aggregated	1.60%	0.60%	0.63	4.06	24.21	0.11	1.54	0.54
LHD1	Diesel	Aggregated	1.22%	0.45%	1.60	29.77	5.64	0.06	1.62	0.80
LHD2	Gasoline	Aggregated	0.24%	0.09%	0.05	0.48	2.35	0.02	0.26	0.09
LHD2	Diesel	Aggregated	0.52%	0.20%	0.58	9.37	1.74	0.03	0.75	0.35
MCY	Gasoline	Aggregated	0.33%	0.32%	11.32	5.86	136.00	0.02	0.17	0.06
MDV	Gasoline	Aggregated	14.17%	13.65%	9.41	58.70	515.94	1.75	7.02	2.46
MDV	Diesel	Aggregated	0.21%	0.21%	0.10	1.05	1.59	0.03	0.15	0.08
MDV	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0.00	0.03	0.01
MDV	Plug-in Hybrid	Aggregated	0.10%	0.09%	0.00	0.01	0.61	0.00	0.03	0.01
MH	Gasoline	Aggregated	0.09%	0.06%	0.11	0.86	3.49	0.03	0.11	0.04
MH	Diesel	Aggregated	0.03%	0.02%	0.06	3.29	0.26	0.01	0.16	0.13
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.01	1.07	0.06	0.01	0.08	0.03
OBUS	Gasoline	Aggregated	0.05%	0.09%	0.19	1.59	4.83	0.04	0.15	0.05
PTO	Diesel	Aggregated	0.07%	0.12%	0.08	10.74	0.93	0.07	0.02	0.02
PTO	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.03%	0.05%	0.12	0.84	2.31	0.01	0.09	0.03
SBUS	Diesel	Aggregated	0.03%	0.06%	0.17	9.37	0.44	0.02	0.16	0.09
SBUS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Natural Gas	Aggregated	0.01%	0.03%	0.05	0.54	11.02	0.00	0.05	0.02
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.03	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.01%	0.00	0.07	0.01	0.00	0.01	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.05%	0.04%	0.01	0.51	0.04	0.01	0.07	0.03
T6 CAIRP Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.03%	0.02%	0.03	0.83	0.09	0.01	0.06	0.03
T6 Instate Delivery Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.04%	0.03%	0.01	0.45	0.05	0.01	0.05	0.02
T6 Instate Delivery Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.16%	0.12%	0.06	2.42	0.24	0.04	0.23	0.10
T6 Instate Delivery Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.05%	0.03%	0.01	0.63	0.05	0.01	0.06	0.02
T6 Instate Delivery Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	Aggregated	0.09%	0.06%	0.07	2.28	0.24	0.02	0.15	0.08
T6 Instate Other Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.21%	0.16%	0.04	2.39	0.22	0.05	0.29	0.12
T6 Instate Other Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.18%	0.14%	0.08	3.30	0.33	0.04	0.28	0.13
T6 Instate Other Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.12%	0.09%	0.02	1.72	0.12	0.03	0.16	0.07
T6 Instate Other Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.14	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.06	0.01	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.08%	0.06%	0.01	1.17	0.08	0.02	0.11	0.04
T6 Instate Tractor Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.09	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.05	0.00	0.00	0.01	0.00
T6 OOS Class 7	Diesel	Aggregated	0.04%	0.03%	0.00	0.34	0.02	0.01	0.05	0.02
T6 Public Class 4	Diesel	Aggregated	0.01%	0.00%	0.00	0.73	0.02	0.00	0.01	0.01
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.01%	0.00	0.55	0.02	0.00	0.02	0.01
T6 Public Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.09	0.00	0.00	0.00

T6 Public Class 6	Diesel	Aggregated	0.01%	0.01%	0.01	0.98	0.03	0.00	0.02	0.01
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.03%	0.02%	0.02	2.78	0.07	0.01	0.05	0.03
T6 Public Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.08	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.01%	0.01%	0.00	0.12	0.01	0.00	0.02	0.01
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.21%	0.15%	0.30	2.30	7.61	0.07	0.25	0.08
T7 CAIRP Class 8	Diesel	Aggregated	1.80%	3.36%	1.30	154.29	5.24	1.45	14.14	6.69
T7 CAIRP Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.04	0.75	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	Aggregated	2.13%	3.98%	1.44	170.98	5.19	1.72	16.50	7.68
T7 NOOS Class 8	Diesel	Aggregated	0.77%	1.45%	0.57	67.65	2.28	0.62	6.11	2.91
T7 POLA Class 8	Diesel	Aggregated	0.45%	0.83%	0.28	39.83	1.87	0.38	3.43	1.53
T7 POLA Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.10	1.83	0.00	0.03	0.01
T7 Public Class 8	Diesel	Aggregated	0.05%	0.09%	0.19	26.94	0.76	0.04	0.52	0.27
T7 Public Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.01	0.24	4.45	0.00	0.10	0.03
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.04%	0.08%	0.02	2.18	0.10	0.04	0.31	0.12
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.06	1.06	0.00	0.02	0.01
T7 Single Dump Class 8	Diesel	Aggregated	0.07%	0.13%	0.06	5.80	0.31	0.06	0.51	0.21
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.09	1.62	0.00	0.03	0.01
T7 Single Other Class 8	Diesel	Aggregated	0.20%	0.37%	0.13	12.64	0.66	0.17	1.43	0.58
T7 Single Other Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.03%	0.01	0.21	4.10	0.00	0.09	0.03
T7 SWCV Class 8	Diesel	Aggregated	0.05%	0.09%	0.01	37.28	0.03	0.10	0.72	0.26
T7 SWCV Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	Aggregated	0.17%	0.31%	0.55	13.79	100.70	0.00	2.29	0.78
T7 Tractor Class 8	Diesel	Aggregated	0.58%	1.09%	0.47	50.11	2.12	0.47	4.38	1.93
T7 Tractor Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	Aggregated	0.01%	0.03%	0.01	0.25	4.62	0.00	0.09	0.03
T7 Utility Class 8	Diesel	Aggregated	0.01%	0.02%	0.00	0.51	0.03	0.01	0.06	0.02
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.08	0.36	5.10	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.02%	0.03%	0.01	0.13	0.36	0.01	0.09	0.03
UBUS	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
UBUS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregated	0.07%	0.13%	0.13	1.82	115.14	0.00	0.53	0.18
TOTAL					56.41	879.65	2,821.19	13.81	99.83	40.91
MDAQMD Daily Thresholds					137	137	548	137	82	65
Exceeds Daily Thresholds?					No	Yes	Yes	No	Yes	No

Based on EMFAC2021, Version 1.0.2., San Bernardino County

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this analysis: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this analysis: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this analysis: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this analysis: LDA, LDT1, LDT2, MCY, and MDV.

Source: Fehr & Peers, 2025

T6 Instate Other Class 5	Diesel	Aggregated	0.21%	0.16%	2,125	0.04	2.39	0.22	0.05	0.29	0.12
T6 Instate Other Class 5	Electricity	Aggregated	0.00%	0.00%	1	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	5	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.18%	0.14%	1,825	0.08	3.30	0.33	0.04	0.28	0.13
T6 Instate Other Class 6	Electricity	Aggregated	0.00%	0.00%	1	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	4	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.12%	0.09%	1,184	0.02	1.72	0.12	0.03	0.16	0.07
T6 Instate Other Class 7	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	31	0.00	0.01	0.14	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	22	0.00	0.06	0.01	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.08%	0.06%	800	0.01	1.17	0.08	0.02	0.11	0.04
T6 Instate Tractor Class 7	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	19	0.00	0.01	0.09	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	14	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	19	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	Aggregated	0.00%	0.00%	49	0.00	0.05	0.00	0.00	0.01	0.00
T6 OOS Class 7	Diesel	Aggregated	0.04%	0.03%	356	0.00	0.34	0.02	0.01	0.05	0.02
T6 Public Class 4	Diesel	Aggregated	0.01%	0.00%	64	0.00	0.73	0.02	0.00	0.01	0.01
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	4	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.01%	115	0.00	0.55	0.02	0.00	0.02	0.01
T6 Public Class 5	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	19	0.00	0.00	0.09	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.01%	0.01%	91	0.01	0.98	0.03	0.00	0.02	0.01
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	9	0.00	0.00	0.04	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.03%	0.02%	251	0.02	2.78	0.07	0.01	0.05	0.03
T6 Public Class 7	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	23	0.00	0.00	0.08	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.01%	0.01%	115	0.00	0.12	0.01	0.00	0.02	0.01
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	1	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	22	0.00	0.02	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	30	0.00	0.02	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.21%	0.15%	2,044	0.30	2.30	7.61	0.07	0.25	0.08
T7 CAIRP Class 8	Diesel	Aggregated	1.80%	3.36%	44,979	1.30	154.29	5.24	1.45	14.14	6.69
T7 CAIRP Class 8	Electricity	Aggregated	0.00%	0.00%	52	0.00	0.00	0.00	0.00	0.01	0.00
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	61	0.00	0.04	0.75	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	Aggregated	2.13%	3.98%	53,316	1.44	170.98	5.19	1.72	16.50	7.68
T7 NOOS Class 8	Diesel	Aggregated	0.77%	1.45%	19,366	0.57	67.65	2.28	0.62	6.11	2.91
T7 POLA Class 8	Diesel	Aggregated	0.45%	0.83%	11,182	0.28	39.83	1.87	0.38	3.43	1.53
T7 POLA Class 8	Electricity	Aggregated	0.00%	0.00%	1	0.00	0.00	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	Aggregated	0.00%	0.01%	115	0.00	0.10	1.83	0.00	0.03	0.01
T7 Public Class 8	Diesel	Aggregated	0.05%	0.09%	1,254	0.19	26.94	0.76	0.04	0.52	0.27
T7 Public Class 8	Electricity	Aggregated	0.00%	0.00%	1	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	389	0.01	0.24	4.45	0.00	0.10	0.03
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.04%	0.08%	1,097	0.02	2.18	0.10	0.04	0.31	0.12
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.01%	90	0.00	0.06	1.06	0.00	0.02	0.01
T7 Single Dump Class 8	Diesel	Aggregated	0.07%	0.13%	1,756	0.06	5.80	0.31	0.06	0.51	0.21
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.01%	105	0.00	0.09	1.62	0.00	0.03	0.01
T7 Single Other Class 8	Diesel	Aggregated	0.20%	0.37%	4,979	0.13	12.64	0.66	0.17	1.43	0.58
T7 Single Other Class 8	Electricity	Aggregated	0.00%	0.00%	3	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.03%	341	0.01	0.21	4.10	0.00	0.09	0.03
T7 SWCV Class 8	Diesel	Aggregated	0.05%	0.09%	1,265	0.01	37.28	0.03	0.10	0.72	0.26
T7 SWCV Class 8	Electricity	Aggregated	0.00%	0.00%	1	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	Aggregated	0.17%	0.31%	4,181	0.55	13.79	100.70	0.00	2.29	0.78
T7 Tractor Class 8	Diesel	Aggregated	0.58%	1.09%	14,542	0.47	50.11	2.12	0.47	4.38	1.93
T7 Tractor Class 8	Electricity	Aggregated	0.00%	0.00%	6	0.00	0.00	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	Aggregated	0.01%	0.03%	371	0.01	0.25	4.62	0.00	0.09	0.03
T7 Utility Class 8	Diesel	Aggregated	0.01%	0.02%	230	0.00	0.51	0.03	0.01	0.06	0.02
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.00%	0	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregated	0.00%	0.00%	15	0.08	0.36	5.10	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.02%	0.03%	376	0.01	0.13	0.36	0.01	0.09	0.03
UBUS	Diesel	Aggregated	0.00%	0.00%	25	0.00	0.02	0.00	0.00	0.01	0.00
UBUS	Electricity	Aggregated	0.00%	0.00%	2	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregated	0.07%	0.13%	1,721	0.13	1.82	115.14	0.00	0.53	0.18
TOTAL						56.41	879.65	2,821.19	13.81	99.83	40.91
MDAQMD Daily Thresholds						137	137	548	137	82	65
Exceeds Daily Thresholds?						No	Yes	Yes	No	Yes	No

Year 2023 Existing: Criteria Air Pollutants - Annual Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ²	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	12.5%	1.1%	1.34%	85.07%
EMFAC Default	6.69%	1.48%	3.58%	88.25%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this anlsys: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this anlsys: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this anlsys: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this anlsys: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	1,339,563
Days per year ¹	347
Annual VMT	464,828,299

Source: Fehr & Peers, 2025

¹ Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/appendices_volume2.pdf

Emission year										
Year 2023					tons/year					
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.02	0.37	0.06	0.00	0.02	0.00
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.00	0.06	0.00	0.00	0.00
LDA	Gasoline	Aggregated	47.36%	45.65%	2.33	10.66	188.11	0.67	3.75	0.47
LDA	Diesel	Aggregated	0.11%	0.11%	0.02	0.13	0.19	0.00	0.02	0.00
LDA	Electricity	Aggregated	1.81%	1.75%	0.00	0.00	0.00	0.00	0.11	0.02
LDA	Plug-in Hybrid	Aggregated	1.36%	1.31%	0.01	0.02	1.50	0.01	0.08	0.01
LDT1	Gasoline	Aggregated	3.59%	3.46%	0.83	3.83	38.58	0.06	0.33	0.04
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.01	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Gasoline	Aggregated	18.85%	18.17%	1.28	8.01	90.81	0.33	1.59	0.19
LDT2	Diesel	Aggregated	0.06%	0.05%	0.00	0.02	0.03	0.00	0.01	0.00
LDT2	Electricity	Aggregated	0.07%	0.07%	0.00	0.00	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	Aggregated	0.15%	0.15%	0.00	0.00	0.16	0.00	0.01	0.00
LHD1	Gasoline	Aggregated	1.60%	0.60%	0.11	0.70	4.20	0.02	0.27	0.01
LHD1	Diesel	Aggregated	1.22%	0.45%	0.28	5.16	0.98	0.01	0.28	0.01
LHD2	Gasoline	Aggregated	0.24%	0.09%	0.01	0.08	0.41	0.00	0.05	0.00
LHD2	Diesel	Aggregated	0.52%	0.20%	0.10	1.63	0.30	0.01	0.13	0.00
MCY	Gasoline	Aggregated	0.33%	0.32%	1.96	1.02	23.60	0.00	0.03	0.00
MDV	Gasoline	Aggregated	14.17%	13.65%	1.63	10.18	89.51	0.30	1.22	0.14
MDV	Diesel	Aggregated	0.21%	0.21%	0.02	0.18	0.28	0.00	0.03	0.00
MDV	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	Aggregated	0.10%	0.09%	0.00	0.00	0.11	0.00	0.01	0.00
MH	Gasoline	Aggregated	0.09%	0.06%	0.02	0.15	0.61	0.01	0.02	0.00
MH	Diesel	Aggregated	0.03%	0.02%	0.01	0.57	0.05	0.00	0.03	0.00
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.00	0.19	0.01	0.00	0.01	0.00
OBUS	Gasoline	Aggregated	0.05%	0.09%	0.03	0.28	0.84	0.01	0.03	0.00
PTO	Diesel	Aggregated	0.07%	0.12%	0.01	1.86	0.16	0.01	0.00	0.00
PTO	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.03%	0.05%	0.02	0.15	0.40	0.00	0.02	0.00
SBUS	Diesel	Aggregated	0.03%	0.06%	0.03	1.63	0.08	0.00	0.03	0.00
SBUS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Natural Gas	Aggregated	0.01%	0.03%	0.01	0.09	1.91	0.00	0.01	0.00
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.01%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.05%	0.04%	0.00	0.09	0.01	0.00	0.01	0.00
T6 CAIRP Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.03%	0.02%	0.00	0.14	0.02	0.00	0.01	0.00
T6 Instate Delivery Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.04%	0.03%	0.00	0.08	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.16%	0.12%	0.01	0.42	0.04	0.01	0.04	0.00
T6 Instate Delivery Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.05%	0.03%	0.00	0.11	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	Aggregated	0.09%	0.06%	0.01	0.40	0.04	0.00	0.03	0.00
T6 Instate Other Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.21%	0.16%	0.01	0.41	0.04	0.01	0.05	0.00
T6 Instate Other Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.18%	0.14%	0.01	0.57	0.06	0.01	0.05	0.00
T6 Instate Other Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.12%	0.09%	0.00	0.30	0.02	0.00	0.03	0.00
T6 Instate Other Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.08%	0.06%	0.00	0.20	0.01	0.00	0.02	0.00
T6 Instate Tractor Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	Aggregated	0.04%	0.03%	0.00	0.06	0.00	0.00	0.01	0.00
T6 Public Class 4	Diesel	Aggregated	0.01%	0.00%	0.00	0.13	0.00	0.00	0.00	0.00
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00

T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.01%	0.00	0.09	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.01%	0.01%	0.00	0.17	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.03%	0.02%	0.00	0.48	0.01	0.00	0.01	0.00	0.00
T6 Public Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.01%	0.01%	0.00	0.02	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.21%	0.15%	0.05	0.40	1.32	0.01	0.04	0.00	0.00
T7 CAIRP Class 8	Diesel	Aggregated	1.80%	3.36%	0.23	26.77	0.91	0.25	2.45	0.15	0.15
T7 CAIRP Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.13	0.00	0.00	0.00	0.00
T7 NNOOS Class 8	Diesel	Aggregated	2.13%	3.98%	0.25	29.67	0.90	0.30	2.86	0.18	0.18
T7 NOOS Class 8	Diesel	Aggregated	0.77%	1.45%	0.10	11.74	0.40	0.11	1.06	0.07	0.07
T7 POLA Class 8	Diesel	Aggregated	0.45%	0.83%	0.05	6.91	0.32	0.07	0.59	0.04	0.04
T7 POLA Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.02	0.32	0.00	0.00	0.00	0.00
T7 Public Class 8	Diesel	Aggregated	0.05%	0.09%	0.03	4.67	0.13	0.01	0.09	0.00	0.00
T7 Public Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.00	0.04	0.77	0.00	0.02	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.04%	0.08%	0.00	0.38	0.02	0.01	0.05	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.01	0.18	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	Aggregated	0.07%	0.13%	0.01	1.01	0.05	0.01	0.09	0.01	0.01
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.01	0.28	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Diesel	Aggregated	0.20%	0.37%	0.02	2.19	0.12	0.03	0.25	0.02	0.02
T7 Single Other Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.03%	0.00	0.04	0.71	0.00	0.01	0.00	0.00
T7 SWCV Class 8	Diesel	Aggregated	0.05%	0.09%	0.00	6.47	0.01	0.02	0.13	0.00	0.00
T7 SWCV Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	Aggregated	0.17%	0.31%	0.09	2.39	17.47	0.00	0.40	0.01	0.01
T7 Tractor Class 8	Diesel	Aggregated	0.58%	1.09%	0.08	8.69	0.37	0.08	0.76	0.05	0.05
T7 Tractor Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	Aggregated	0.01%	0.03%	0.00	0.04	0.80	0.00	0.02	0.00	0.00
T7 Utility Class 8	Diesel	Aggregated	0.01%	0.02%	0.00	0.09	0.00	0.00	0.01	0.00	0.00
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.01	0.06	0.88	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.02%	0.03%	0.00	0.02	0.06	0.00	0.02	0.00	0.00
UBUS	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Natural Gas	Aggregated	0.07%	0.13%	0.02	0.32	19.98	0.00	0.09	0.00	0.00
TOTAL					9.79	152.62	489.48	2.40	17.32	1.46	
MDAQMD Daily Thresholds					25	25	100	25	15	12	
Exceeds Daily Thresholds?					No	Yes	Yes	No	Yes	No	

Year 2048 Existing: Criteria Air Pollutants - Daily Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	12.5%	1.1%	1.34%	85.07%
EMFAC Default	10.92%	2.00%	3.03%	84.05%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this analysis: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this analysis: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this analysis: LHD1 and LHD2.

⁴ Consist of the following EMFAC vehicle categories for purposes of this analysis: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	1,339,563
-----------	-----------

Source: Fehr & Peers, 2025

Emission year										
Year 2048						lbs/day				
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.02%	0.01	0.35	0.04	0.00	0.03	0.01
All Other Buses	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.26	0.00	0.01	0.00
LDA	Gasoline	Aggregated	39.09%	39.57%	3.25	22.24	563.92	2.62	17.81	5.61
LDA	Diesel	Aggregated	0.02%	0.02%	0.00	0.01	0.08	0.00	0.01	0.00
LDA	Electricity	Aggregated	5.06%	5.13%	0.00	0.00	0.00	0.00	1.88	0.54
LDA	Plug-in Hybrid	Aggregated	1.84%	1.86%	0.06	0.14	9.89	0.06	0.66	0.19
LDT1	Gasoline	Aggregated	2.44%	2.47%	0.22	1.49	37.66	0.19	1.20	0.38
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.08%	0.08%	0.00	0.00	0.00	0.00	0.03	0.01
LDT1	Plug-in Hybrid	Aggregated	0.06%	0.06%	0.00	0.00	0.32	0.00	0.02	0.01
LDT2	Gasoline	Aggregated	20.62%	20.87%	2.39	13.26	349.62	1.65	10.09	3.21
LDT2	Diesel	Aggregated	0.08%	0.08%	0.03	0.06	0.27	0.01	0.05	0.02
LDT2	Electricity	Aggregated	0.58%	0.59%	0.00	0.00	0.00	0.00	0.22	0.06
LDT2	Plug-in Hybrid	Aggregated	0.57%	0.58%	0.02	0.04	3.06	0.02	0.21	0.06
LHD1	Gasoline	Aggregated	0.75%	0.33%	0.02	0.18	6.20	0.05	0.85	0.30
LHD1	Diesel	Aggregated	0.51%	0.23%	0.24	1.24	0.46	0.03	0.67	0.27
LHD1	Electricity	Aggregated	1.15%	0.51%	0.00	0.00	0.00	0.00	0.70	0.23
LHD2	Gasoline	Aggregated	0.09%	0.04%	0.00	0.03	0.76	0.01	0.12	0.04
LHD2	Diesel	Aggregated	0.25%	0.11%	0.16	0.96	0.30	0.02	0.38	0.16
LHD2	Electricity	Aggregated	0.28%	0.12%	0.00	0.00	0.00	0.00	0.20	0.07
MCY	Gasoline	Aggregated	0.26%	0.26%	5.82	3.53	71.17	0.01	0.14	0.06
MDV	Gasoline	Aggregated	12.29%	12.44%	1.49	8.28	216.14	1.19	6.06	1.93
MDV	Diesel	Aggregated	0.13%	0.14%	0.02	0.07	0.52	0.01	0.07	0.02
MDV	Electricity	Aggregated	0.54%	0.55%	0.00	0.00	0.00	0.00	0.20	0.06
MDV	Plug-in Hybrid	Aggregated	0.37%	0.38%	0.01	0.03	1.99	0.01	0.13	0.04
MH	Gasoline	Aggregated	0.03%	0.02%	0.00	0.11	0.07	0.01	0.03	0.01
MH	Diesel	Aggregated	0.02%	0.01%	0.01	0.53	0.03	0.00	0.03	0.01
Motor Coach	Diesel	Aggregated	0.01%	0.01%	0.00	0.34	0.02	0.01	0.04	0.02
OBUS	Gasoline	Aggregated	0.01%	0.01%	0.00	0.10	0.07	0.01	0.02	0.01
OBUS	Electricity	Aggregated	0.02%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
PTO	Diesel	Aggregated	0.05%	0.05%	0.02	3.72	0.27	0.03	0.01	0.01
PTO	Electricity	Aggregated	0.05%	0.06%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.01%	0.02%	0.01	0.06	0.09	0.00	0.03	0.01
SBUS	Diesel	Aggregated	0.01%	0.01%	0.00	0.17	0.03	0.00	0.02	0.01
SBUS	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.03	0.01
SBUS	Natural Gas	Aggregated	0.01%	0.01%	0.01	0.06	2.36	0.00	0.02	0.01
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.01	0.00	0.00	0.01	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.06%	0.04%	0.01	0.19	0.03	0.01	0.06	0.02
T6 CAIRP Class 7	Electricity	Aggregated	0.02%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.02%	0.01%	0.00	0.07	0.01	0.00	0.02	0.01
T6 Instate Delivery Class 4	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.03%	0.01%	0.00	0.08	0.01	0.00	0.03	0.01
T6 Instate Delivery Class 5	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.11%	0.06%	0.01	0.35	0.06	0.02	0.10	0.04
T6 Instate Delivery Class 6	Electricity	Aggregated	0.14%	0.08%	0.00	0.00	0.00	0.00	0.07	0.02
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.04%	0.02%	0.00	0.21	0.03	0.01	0.04	0.02
T6 Instate Delivery Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	Aggregated	0.06%	0.03%	0.00	0.18	0.03	0.01	0.06	0.02
T6 Instate Other Class 4	Electricity	Aggregated	0.08%	0.04%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.14%	0.08%	0.01	0.44	0.07	0.02	0.14	0.05
T6 Instate Other Class 5	Electricity	Aggregated	0.19%	0.10%	0.00	0.00	0.00	0.00	0.10	0.03
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.12%	0.07%	0.01	0.38	0.06	0.02	0.12	0.04
T6 Instate Other Class 6	Electricity	Aggregated	0.16%	0.09%	0.00	0.00	0.00	0.00	0.09	0.03
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.10%	0.06%	0.01	0.46	0.06	0.02	0.10	0.04
T6 Instate Other Class 7	Electricity	Aggregated	0.09%	0.05%	0.00	0.00	0.00	0.00	0.05	0.01
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.10%	0.06%	0.01	0.44	0.06	0.01	0.10	0.04
T6 Instate Tractor Class 7	Electricity	Aggregated	0.03%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 OOS Class 7	Diesel	Aggregated	0.06%	0.03%	0.00	0.20	0.03	0.01	0.05	0.02
T6 Public Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Public Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00

T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.01%	0.01%	0.00	0.04	0.01	0.00	0.01	0.00
T6 Public Class 7	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Utility Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.08%	0.04%	0.01	0.08	0.19	0.02	0.07	0.02
T6TS	Electricity	Aggregated	0.10%	0.06%	0.00	0.00	0.00	0.00	0.06	0.02
T7 CAIRP Class 8	Diesel	Aggregated	2.43%	2.78%	0.90	91.48	2.46	0.99	11.97	5.42
T7 CAIRP Class 8	Electricity	Aggregated	0.71%	0.81%	0.00	0.00	0.00	0.00	1.82	0.55
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.26	0.00	0.01	0.00
T7 NNOOS Class 8	Diesel	Aggregated	3.71%	4.25%	1.34	154.97	3.66	1.44	18.27	8.25
T7 NOOS Class 8	Diesel	Aggregated	1.35%	1.54%	0.50	57.90	1.37	0.52	6.72	3.07
T7 POLA Class 8	Diesel	Aggregated	0.48%	0.55%	0.16	17.96	0.56	0.21	2.32	1.01
T7 POLA Class 8	Electricity	Aggregated	0.09%	0.11%	0.00	0.00	0.00	0.00	0.24	0.07
T7 POLA Class 8	Natural Gas	Aggregated	0.02%	0.02%	0.01	0.10	1.87	0.00	0.08	0.03
T7 Public Class 8	Diesel	Aggregated	0.02%	0.02%	0.01	0.77	0.03	0.01	0.07	0.03
T7 Public Class 8	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.07	0.02
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.02%	0.01	0.11	2.02	0.00	0.08	0.02
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.02%	0.02%	0.00	0.39	0.02	0.01	0.08	0.03
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.07	0.02
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.12	0.00	0.01	0.00
T7 Single Dump Class 8	Diesel	Aggregated	0.03%	0.04%	0.01	1.01	0.04	0.02	0.15	0.06
T7 Single Dump Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.09	0.03
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.25	0.00	0.01	0.00
T7 Single Other Class 8	Diesel	Aggregated	0.17%	0.19%	0.05	4.55	0.18	0.08	0.76	0.31
T7 Single Other Class 8	Electricity	Aggregated	0.19%	0.22%	0.00	0.00	0.00	0.00	0.51	0.15
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.01%	0.01	0.06	1.26	0.00	0.05	0.02
T7 SWCV Class 8	Diesel	Aggregated	0.00%	0.00%	0.00	0.30	0.00	0.00	0.03	0.01
T7 SWCV Class 8	Electricity	Aggregated	0.09%	0.10%	0.00	0.00	0.00	0.00	0.43	0.14
T7 SWCV Class 8	Natural Gas	Aggregated	0.11%	0.13%	0.02	0.75	22.26	0.00	0.93	0.31
T7 Tractor Class 8	Diesel	Aggregated	0.84%	0.96%	0.28	30.64	0.89	0.34	4.04	1.75
T7 Tractor Class 8	Electricity	Aggregated	0.18%	0.21%	0.00	0.00	0.00	0.00	0.47	0.14
T7 Tractor Class 8	Natural Gas	Aggregated	0.02%	0.02%	0.01	0.09	1.74	0.00	0.07	0.02
T7 Utility Class 8	Diesel	Aggregated	0.00%	0.01%	0.00	0.12	0.01	0.00	0.02	0.01
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.00	0.02	0.23	0.00	0.00	0.00
T7IS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.01%	0.01%	0.00	0.01	0.17	0.00	0.03	0.01
UBUS	Electricity	Aggregated	0.09%	0.11%	0.00	0.00	0.00	0.00	0.27	0.08
UBUS	Natural Gas	Aggregated	0.01%	0.01%	0.01	0.04	0.02	0.00	0.03	0.01
TOTAL					17.21	421.55	1,306.03	9.71	93.15	35.49
MDAQMD Daily Thresholds					137	137	548	137	82	65
Exceeds Daily Thresholds?					No	Yes	Yes	No	Yes	No

Year 2048 Existing: Criteria Air Pollutants - Annual Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	12.5%	1.1%	1.34%	85.07%
EMFAC Default	10.92%	2.00%	3.03%	84.05%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this analysis: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this analysis: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this analysis: LHD1 and LHD2.

⁴ Consist of the following EMFAC vehicle categories for purposes of this analysis: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	1,339,563
Days per year ¹	347
Annual VMT	464,828,299

Source: Fehr & Peers, 2025

¹ Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/appendices_volume2.pdf

Emission year										
Year 2048					tons/year					
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.02%	0.00	0.06	0.01	0.00	0.01	0.00
All Other Buses	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
LDA	Gasoline	Aggregated	39.09%	39.57%	0.56	3.86	97.84	0.46	3.09	0.41
LDA	Diesel	Aggregated	0.02%	0.02%	0.00	0.00	0.01	0.00	0.00	0.00
LDA	Electricity	Aggregated	5.06%	5.13%	0.00	0.00	0.00	0.00	0.33	0.05
LDA	Plug-in Hybrid	Aggregated	1.84%	1.86%	0.01	0.02	1.72	0.01	0.12	0.02
LDT1	Gasoline	Aggregated	2.44%	2.47%	0.04	0.26	6.53	0.03	0.21	0.03
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.08%	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	Aggregated	0.06%	0.06%	0.00	0.00	0.06	0.00	0.00	0.00
LDT2	Gasoline	Aggregated	20.62%	20.87%	0.41	2.30	60.66	0.29	1.75	0.21
LDT2	Diesel	Aggregated	0.08%	0.08%	0.00	0.01	0.05	0.00	0.01	0.00
LDT2	Electricity	Aggregated	0.58%	0.59%	0.00	0.00	0.00	0.00	0.04	0.01
LDT2	Plug-in Hybrid	Aggregated	0.57%	0.58%	0.00	0.01	0.53	0.00	0.04	0.01
LHD1	Gasoline	Aggregated	0.75%	0.33%	0.00	0.03	1.08	0.01	0.15	0.00
LHD1	Diesel	Aggregated	0.51%	0.23%	0.04	0.21	0.08	0.01	0.12	0.00
LHD1	Electricity	Aggregated	1.15%	0.51%	0.00	0.00	0.00	0.00	0.12	0.01
LHD2	Gasoline	Aggregated	0.09%	0.04%	0.00	0.00	0.13	0.00	0.02	0.00
LHD2	Diesel	Aggregated	0.25%	0.11%	0.03	0.17	0.05	0.00	0.07	0.00
LHD2	Electricity	Aggregated	0.28%	0.12%	0.00	0.00	0.00	0.00	0.03	0.00
MCY	Gasoline	Aggregated	0.26%	0.26%	1.01	0.61	12.35	0.00	0.02	0.00
MDV	Gasoline	Aggregated	12.29%	12.44%	0.26	1.44	37.50	0.21	1.05	0.13
MDV	Diesel	Aggregated	0.13%	0.14%	0.00	0.01	0.09	0.00	0.01	0.00
MDV	Electricity	Aggregated	0.54%	0.55%	0.00	0.00	0.00	0.00	0.03	0.01
MDV	Plug-in Hybrid	Aggregated	0.37%	0.38%	0.00	0.00	0.35	0.00	0.02	0.00
MH	Gasoline	Aggregated	0.03%	0.02%	0.00	0.02	0.01	0.00	0.01	0.00
MH	Diesel	Aggregated	0.02%	0.01%	0.00	0.09	0.01	0.00	0.00	0.00
Motor Coach	Diesel	Aggregated	0.01%	0.01%	0.00	0.06	0.00	0.00	0.01	0.00
OBUS	Gasoline	Aggregated	0.01%	0.01%	0.00	0.02	0.01	0.00	0.00	0.00
OBUS	Electricity	Aggregated	0.02%	0.02%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	Aggregated	0.05%	0.05%	0.00	0.65	0.05	0.00	0.00	0.00
PTO	Electricity	Aggregated	0.05%	0.06%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	0.01	0.02	0.00	0.00	0.00
SBUS	Diesel	Aggregated	0.01%	0.01%	0.00	0.03	0.00	0.00	0.00	0.00
SBUS	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.01	0.00
SBUS	Natural Gas	Aggregated	0.01%	0.01%	0.00	0.01	0.41	0.00	0.00	0.00
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.06%	0.04%	0.00	0.03	0.01	0.00	0.01	0.00
T6 CAIRP Class 7	Electricity	Aggregated	0.02%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.02%	0.01%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.03%	0.01%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.11%	0.06%	0.00	0.06	0.01	0.00	0.02	0.00
T6 Instate Delivery Class 6	Electricity	Aggregated	0.14%	0.08%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.04%	0.02%	0.00	0.04	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	Aggregated	0.06%	0.03%	0.00	0.03	0.01	0.00	0.01	0.00
T6 Instate Other Class 4	Electricity	Aggregated	0.08%	0.04%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.14%	0.08%	0.00	0.08	0.01	0.00	0.02	0.00
T6 Instate Other Class 5	Electricity	Aggregated	0.19%	0.10%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.12%	0.07%	0.00	0.07	0.01	0.00	0.02	0.00
T6 Instate Other Class 6	Electricity	Aggregated	0.16%	0.09%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.10%	0.06%	0.00	0.08	0.01	0.00	0.02	0.00
T6 Instate Other Class 7	Electricity	Aggregated	0.09%	0.05%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.10%	0.06%	0.00	0.08	0.01	0.00	0.02	0.00
T6 Instate Tractor Class 7	Electricity	Aggregated	0.03%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 7	Diesel	Aggregated	0.06%	0.03%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00

T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.01%	0.01%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 7	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.08%	0.04%	0.00	0.01	0.03	0.00	0.01	0.00
T6TS	Electricity	Aggregated	0.10%	0.06%	0.00	0.00	0.00	0.00	0.01	0.00
T7 CAIRP Class 8	Diesel	Aggregated	2.43%	2.78%	0.16	15.87	0.43	0.17	2.08	0.13
T7 CAIRP Class 8	Electricity	Aggregated	0.71%	0.81%	0.00	0.00	0.00	0.00	0.32	0.04
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T7 NNOOS Class 8	Diesel	Aggregated	3.71%	4.25%	0.23	26.89	0.63	0.25	3.17	0.20
T7 NOOS Class 8	Diesel	Aggregated	1.35%	1.54%	0.09	10.05	0.24	0.09	1.17	0.07
T7 POLA Class 8	Diesel	Aggregated	0.48%	0.55%	0.03	3.12	0.10	0.04	0.40	0.03
T7 POLA Class 8	Electricity	Aggregated	0.09%	0.11%	0.00	0.00	0.00	0.00	0.04	0.00
T7 POLA Class 8	Natural Gas	Aggregated	0.02%	0.02%	0.00	0.02	0.32	0.00	0.01	0.00
T7 Public Class 8	Diesel	Aggregated	0.02%	0.02%	0.00	0.13	0.01	0.00	0.01	0.00
T7 Public Class 8	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.01	0.00
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.02%	0.00	0.02	0.35	0.00	0.01	0.00
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.02%	0.02%	0.00	0.07	0.00	0.00	0.01	0.00
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.01	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	Aggregated	0.03%	0.04%	0.00	0.17	0.01	0.00	0.03	0.00
T7 Single Dump Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.02	0.00
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T7 Single Other Class 8	Diesel	Aggregated	0.17%	0.19%	0.01	0.79	0.03	0.01	0.13	0.01
T7 Single Other Class 8	Electricity	Aggregated	0.19%	0.22%	0.00	0.00	0.00	0.00	0.09	0.01
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.01%	0.00	0.01	0.22	0.00	0.01	0.00
T7 SWCV Class 8	Diesel	Aggregated	0.00%	0.00%	0.00	0.05	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Electricity	Aggregated	0.09%	0.10%	0.00	0.00	0.00	0.00	0.07	0.00
T7 SWCV Class 8	Natural Gas	Aggregated	0.11%	0.13%	0.00	0.13	3.86	0.00	0.16	0.01
T7 Tractor Class 8	Diesel	Aggregated	0.84%	0.96%	0.05	5.32	0.15	0.06	0.70	0.04
T7 Tractor Class 8	Electricity	Aggregated	0.18%	0.21%	0.00	0.00	0.00	0.00	0.08	0.01
T7 Tractor Class 8	Natural Gas	Aggregated	0.02%	0.02%	0.00	0.02	0.30	0.00	0.01	0.00
T7 Utility Class 8	Diesel	Aggregated	0.00%	0.01%	0.00	0.02	0.00	0.00	0.00	0.00
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T7IS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.01%	0.01%	0.00	0.00	0.03	0.00	0.01	0.00
UBUS	Electricity	Aggregated	0.09%	0.11%	0.00	0.00	0.00	0.00	0.05	0.00
UBUS	Natural Gas	Aggregated	0.01%	0.01%	0.00	0.01	0.00	0.00	0.01	0.00

TOTAL	2.99	73.14	226.60	1.69	16.16	1.47
MDAQMD Daily Thresholds	25	25	100	25	15	12
Exceeds Daily Thresholds?	No	Yes	Yes	No	Yes	No

Year 2048 Proposed Project: Criteria Air Pollutants - Daily Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	18.0%	1.5%	1.68%	78.77%
EMFAC Default	10.92%	2.00%	3.03%	84.05%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this analysis: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this analysis: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this analysis: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this analysis: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	2,177,250
-----------	-----------

Source: Fehr & Peers, 2025

Emission year										
Year 2048						lbs/day				
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.02	0.81	0.08	0.01	0.08	0.03
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.02	0.61	0.00	0.02	0.01
LDA	Gasoline	Aggregated	39.09%	36.64%	4.89	33.47	848.73	3.95	26.80	8.45
LDA	Diesel	Aggregated	0.02%	0.02%	0.00	0.01	0.12	0.00	0.02	0.01
LDA	Electricity	Aggregated	5.06%	4.75%	0.00	0.00	0.00	0.00	2.82	0.81
LDA	Plug-in Hybrid	Aggregated	1.84%	1.72%	0.09	0.20	14.88	0.09	1.00	0.29
LDT1	Gasoline	Aggregated	2.44%	2.29%	0.33	2.25	56.67	0.28	1.81	0.58
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0.00	0.04	0.01
LDT1	Plug-in Hybrid	Aggregated	0.06%	0.06%	0.00	0.01	0.48	0.00	0.03	0.01
LDT2	Gasoline	Aggregated	20.62%	19.33%	3.59	19.95	526.20	2.49	15.18	4.83
LDT2	Diesel	Aggregated	0.08%	0.07%	0.04	0.09	0.41	0.01	0.07	0.03
LDT2	Electricity	Aggregated	0.58%	0.55%	0.00	0.00	0.00	0.00	0.33	0.09
LDT2	Plug-in Hybrid	Aggregated	0.57%	0.54%	0.03	0.06	4.61	0.03	0.31	0.09
LHD1	Gasoline	Aggregated	0.75%	0.42%	0.03	0.36	12.65	0.10	1.74	0.61
LHD1	Diesel	Aggregated	0.51%	0.28%	0.49	2.53	0.93	0.06	1.37	0.55
LHD1	Electricity	Aggregated	1.15%	0.63%	0.00	0.00	0.00	0.00	1.43	0.48
LHD2	Gasoline	Aggregated	0.09%	0.05%	0.00	0.06	1.54	0.01	0.24	0.08
LHD2	Diesel	Aggregated	0.25%	0.14%	0.32	1.97	0.61	0.03	0.77	0.32
LHD2	Electricity	Aggregated	0.28%	0.16%	0.00	0.00	0.00	0.00	0.40	0.13
MCY	Gasoline	Aggregated	0.26%	0.24%	8.76	5.31	107.12	0.02	0.21	0.08
MDV	Gasoline	Aggregated	12.29%	11.51%	2.24	12.46	325.29	1.80	9.13	2.91
MDV	Diesel	Aggregated	0.13%	0.13%	0.03	0.10	0.78	0.02	0.10	0.04
MDV	Electricity	Aggregated	0.54%	0.51%	0.00	0.00	0.00	0.00	0.30	0.09
MDV	Plug-in Hybrid	Aggregated	0.37%	0.35%	0.02	0.04	3.00	0.02	0.20	0.06
MH	Gasoline	Aggregated	0.03%	0.02%	0.01	0.25	0.16	0.02	0.07	0.02
MH	Diesel	Aggregated	0.02%	0.01%	0.02	1.18	0.07	0.01	0.06	0.03
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.01	0.80	0.05	0.01	0.10	0.04
OBUS	Gasoline	Aggregated	0.01%	0.02%	0.01	0.24	0.15	0.01	0.06	0.02
OBUS	Electricity	Aggregated	0.02%	0.03%	0.00	0.00	0.00	0.00	0.04	0.01
PTO	Diesel	Aggregated	0.05%	0.08%	0.05	8.72	0.63	0.06	0.01	0.01
PTO	Electricity	Aggregated	0.05%	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.01%	0.02%	0.01	0.14	0.22	0.01	0.06	0.02
SBUS	Diesel	Aggregated	0.01%	0.02%	0.01	0.39	0.06	0.01	0.06	0.02
SBUS	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.07	0.02
SBUS	Natural Gas	Aggregated	0.01%	0.01%	0.03	0.14	5.55	0.00	0.04	0.01
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.03	0.01	0.00	0.01	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.06%	0.05%	0.01	0.42	0.07	0.02	0.14	0.05
T6 CAIRP Class 7	Electricity	Aggregated	0.02%	0.02%	0.00	0.00	0.00	0.00	0.03	0.01
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.02%	0.02%	0.00	0.16	0.03	0.01	0.05	0.02
T6 Instate Delivery Class 4	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.03%	0.02%	0.00	0.19	0.03	0.01	0.06	0.02
T6 Instate Delivery Class 5	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.11%	0.08%	0.02	0.77	0.13	0.04	0.23	0.09
T6 Instate Delivery Class 6	Electricity	Aggregated	0.14%	0.10%	0.00	0.00	0.00	0.00	0.17	0.05
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.04%	0.03%	0.01	0.47	0.06	0.01	0.09	0.03
T6 Instate Delivery Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	Aggregated	0.06%	0.04%	0.01	0.40	0.07	0.02	0.13	0.05
T6 Instate Other Class 4	Electricity	Aggregated	0.08%	0.06%	0.00	0.00	0.00	0.00	0.09	0.03
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.14%	0.11%	0.03	0.98	0.17	0.05	0.31	0.12
T6 Instate Other Class 5	Electricity	Aggregated	0.19%	0.14%	0.00	0.00	0.00	0.00	0.23	0.07
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.12%	0.09%	0.02	0.86	0.14	0.04	0.27	0.10
T6 Instate Other Class 6	Electricity	Aggregated	0.16%	0.12%	0.00	0.00	0.00	0.00	0.20	0.06
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.10%	0.08%	0.02	1.04	0.14	0.03	0.22	0.08
T6 Instate Other Class 7	Electricity	Aggregated	0.09%	0.07%	0.00	0.00	0.00	0.00	0.11	0.03
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.14	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.10%	0.08%	0.02	0.98	0.13	0.03	0.22	0.08
T6 Instate Tractor Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.14	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 OOS Class 6	Diesel	Aggregated	0.01%	0.01%	0.00	0.06	0.01	0.00	0.02	0.01
T6 OOS Class 7	Diesel	Aggregated	0.06%	0.04%	0.01	0.44	0.06	0.02	0.12	0.05
T6 Public Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.00%	0.00	0.05	0.01	0.00	0.01	0.00
T6 Public Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00

T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.01%	0.01%	0.00	0.10	0.01	0.00	0.03	0.01
T6 Public Class 7	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.12	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Utility Class 5	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.08%	0.06%	0.02	0.18	0.44	0.04	0.16	0.05
T6TS	Electricity	Aggregated	0.10%	0.08%	0.00	0.00	0.00	0.00	0.12	0.04
T7 CAIRP Class 8	Diesel	Aggregated	2.43%	4.01%	2.12	214.57	5.77	2.31	28.09	12.71
T7 CAIRP Class 8	Electricity	Aggregated	0.71%	1.17%	0.00	0.00	0.00	0.00	4.26	1.29
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.03	0.61	0.00	0.03	0.01
T7 NNOOS Class 8	Diesel	Aggregated	3.71%	6.13%	3.15	363.52	8.58	3.38	42.86	19.34
T7 NOOS Class 8	Diesel	Aggregated	1.35%	2.23%	1.18	135.81	3.21	1.23	15.76	7.21
T7 POLA Class 8	Diesel	Aggregated	0.48%	0.79%	0.38	42.14	1.31	0.49	5.45	2.36
T7 POLA Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.57	0.17
T7 POLA Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.02	0.23	4.38	0.00	0.19	0.06
T7 Public Class 8	Diesel	Aggregated	0.02%	0.03%	0.02	1.81	0.07	0.02	0.18	0.07
T7 Public Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.16	0.05
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.02	0.25	4.75	0.00	0.18	0.06
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.02%	0.03%	0.01	0.92	0.04	0.02	0.18	0.07
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.16	0.05
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.29	0.00	0.01	0.00
T7 Single Dump Class 8	Diesel	Aggregated	0.03%	0.05%	0.02	2.36	0.09	0.04	0.36	0.15
T7 Single Dump Class 8	Electricity	Aggregated	0.03%	0.06%	0.00	0.00	0.00	0.00	0.21	0.06
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.03	0.59	0.00	0.02	0.01
T7 Single Other Class 8	Diesel	Aggregated	0.17%	0.27%	0.11	10.68	0.42	0.18	1.78	0.72
T7 Single Other Class 8	Electricity	Aggregated	0.19%	0.32%	0.00	0.00	0.00	0.00	1.19	0.36
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.02%	0.01	0.15	2.96	0.00	0.11	0.04
T7 SWCV Class 8	Diesel	Aggregated	0.00%	0.00%	0.00	0.70	0.00	0.01	0.06	0.03
T7 SWCV Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	1.01	0.33
T7 SWCV Class 8	Natural Gas	Aggregated	0.11%	0.18%	0.06	1.76	52.21	0.00	2.18	0.73
T7 Tractor Class 8	Diesel	Aggregated	0.84%	1.39%	0.67	71.87	2.09	0.80	9.48	4.10
T7 Tractor Class 8	Electricity	Aggregated	0.18%	0.30%	0.00	0.00	0.00	0.00	1.10	0.33
T7 Tractor Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.02	0.22	4.09	0.00	0.17	0.06
T7 Utility Class 8	Diesel	Aggregated	0.00%	0.01%	0.00	0.27	0.01	0.01	0.05	0.02
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.01	0.05	0.53	0.00	0.00	0.00
T7IS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	0.01	0.41	0.00	0.08	0.03
UBUS	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.62	0.20
UBUS	Natural Gas	Aggregated	0.01%	0.02%	0.03	0.10	0.05	0.00	0.08	0.03
TOTAL					29.06	946.39	2,006.37	17.87	184.87	72.61
MDAQMD Daily Thresholds					137	137	548	137	82	65
Exceeds Daily Thresholds?					No	Yes	Yes	No	Yes	Yes

Year 2048 Proposed Project: Criteria Air Pollutants - Daily Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	18.0%	1.5%	1.68%	78.77%
EMFAC Default	10.92%	2.00%	3.03%	84.05%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this analysys: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this analysys: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this analysys: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this analysys: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	2,177,250
-----------	-----------

Source: Fehr & Peers, 2025

HHDT

MHDT

LHDT

LDA

Total

ROG	NOx	CO	SOx	PM10	PM2.5
7.98	858.77	99.82	8.59	117.14	50.85
0.22	8.74	2.52	0.37	3.41	1.21
0.84	4.91	15.74	0.20	5.96	2.18
20.02	73.96	1,888.29	8.71	58.36	18.37
29.06	946.39	2,006.37	17.87	184.87	72.61

Emission year										
Year 2048					lbs/day					
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.02	0.81	0.08	0.01	0.08	0.03
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.02	0.61	0.00	0.02	0.01
LDA	Gasoline	Aggregated	39.09%	36.64%	4.89	33.47	848.73	3.95	26.80	8.45
LDA	Diesel	Aggregated	0.02%	0.02%	0.00	0.01	0.12	0.00	0.02	0.01
LDA	Electricity	Aggregated	5.06%	4.75%	0.00	0.00	0.00	0.00	2.82	0.81
LDA	Plug-in Hybrid	Aggregated	1.84%	1.72%	0.09	0.20	14.88	0.09	1.00	0.29
LDT1	Gasoline	Aggregated	2.44%	2.29%	0.33	2.25	56.67	0.28	1.81	0.58
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0.00	0.04	0.01
LDT1	Plug-in Hybrid	Aggregated	0.06%	0.06%	0.00	0.01	0.48	0.00	0.03	0.01
LDT2	Gasoline	Aggregated	20.62%	19.33%	3.59	19.95	526.20	2.49	15.18	4.83
LDT2	Diesel	Aggregated	0.08%	0.07%	0.04	0.09	0.41	0.01	0.07	0.03
LDT2	Electricity	Aggregated	0.58%	0.55%	0.00	0.00	0.00	0.00	0.33	0.09
LDT2	Plug-in Hybrid	Aggregated	0.57%	0.54%	0.03	0.06	4.61	0.03	0.31	0.09
LHD1	Gasoline	Aggregated	0.75%	0.42%	0.03	0.36	12.65	0.10	1.74	0.61
LHD1	Diesel	Aggregated	0.51%	0.28%	0.49	2.53	0.93	0.06	1.37	0.55
LHD1	Electricity	Aggregated	1.15%	0.63%	0.00	0.00	0.00	0.00	1.43	0.48
LHD2	Gasoline	Aggregated	0.09%	0.05%	0.00	0.06	1.54	0.01	0.24	0.08
LHD2	Diesel	Aggregated	0.25%	0.14%	0.32	1.97	0.61	0.03	0.77	0.32
LHD2	Electricity	Aggregated	0.28%	0.16%	0.00	0.00	0.00	0.00	0.40	0.13
MCY	Gasoline	Aggregated	0.26%	0.24%	8.76	5.31	107.12	0.02	0.21	0.08
MDV	Gasoline	Aggregated	12.29%	11.51%	2.24	12.46	325.29	1.80	9.13	2.91
MDV	Diesel	Aggregated	0.13%	0.13%	0.03	0.10	0.78	0.02	0.10	0.04
MDV	Electricity	Aggregated	0.54%	0.51%	0.00	0.00	0.00	0.00	0.30	0.09
MDV	Plug-in Hybrid	Aggregated	0.37%	0.35%	0.02	0.04	3.00	0.02	0.20	0.06
MH	Gasoline	Aggregated	0.03%	0.02%	0.01	0.25	0.16	0.02	0.07	0.02
MH	Diesel	Aggregated	0.02%	0.01%	0.02	1.18	0.07	0.01	0.06	0.03
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.01	0.80	0.05	0.01	0.10	0.04
OBUS	Gasoline	Aggregated	0.01%	0.02%	0.01	0.24	0.15	0.01	0.06	0.02
OBUS	Electricity	Aggregated	0.02%	0.03%	0.00	0.00	0.00	0.00	0.04	0.01
PTO	Diesel	Aggregated	0.05%	0.08%	0.05	8.72	0.63	0.06	0.01	0.01
PTO	Electricity	Aggregated	0.05%	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.01%	0.02%	0.01	0.14	0.22	0.01	0.06	0.02
SBUS	Diesel	Aggregated	0.01%	0.02%	0.01	0.39	0.06	0.01	0.06	0.02
SBUS	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.07	0.02
SBUS	Natural Gas	Aggregated	0.01%	0.01%	0.03	0.14	5.55	0.00	0.04	0.01
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.03	0.01	0.00	0.01	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.06%	0.05%	0.01	0.42	0.07	0.02	0.14	0.05
T6 CAIRP Class 7	Electricity	Aggregated	0.02%	0.02%	0.00	0.00	0.00	0.00	0.03	0.01
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.02%	0.02%	0.00	0.16	0.03	0.01	0.05	0.02
T6 Instate Delivery Class 4	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.03%	0.02%	0.00	0.19	0.03	0.01	0.06	0.02
T6 Instate Delivery Class 5	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.11%	0.08%	0.02	0.77	0.13	0.04	0.23	0.09
T6 Instate Delivery Class 6	Electricity	Aggregated	0.14%	0.10%	0.00	0.00	0.00	0.00	0.17	0.05
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.04%	0.03%	0.01	0.47	0.06	0.01	0.09	0.03
T6 Instate Delivery Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00

T6 Instate Other Class 4	Diesel	Aggregated	0.06%	0.04%	0.01	0.40	0.07	0.02	0.13	0.05
T6 Instate Other Class 4	Electricity	Aggregated	0.08%	0.06%	0.00	0.00	0.00	0.00	0.09	0.03
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.14%	0.11%	0.03	0.98	0.17	0.05	0.31	0.12
T6 Instate Other Class 5	Electricity	Aggregated	0.19%	0.14%	0.00	0.00	0.00	0.00	0.23	0.07
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.12%	0.09%	0.02	0.86	0.14	0.04	0.27	0.10
T6 Instate Other Class 6	Electricity	Aggregated	0.16%	0.12%	0.00	0.00	0.00	0.00	0.20	0.06
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.10%	0.08%	0.02	1.04	0.14	0.03	0.22	0.08
T6 Instate Other Class 7	Electricity	Aggregated	0.09%	0.07%	0.00	0.00	0.00	0.00	0.11	0.03
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.14	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.10%	0.08%	0.02	0.98	0.13	0.03	0.22	0.08
T6 Instate Tractor Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.14	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 OOS Class 6	Diesel	Aggregated	0.01%	0.01%	0.00	0.06	0.01	0.00	0.02	0.01
T6 OOS Class 7	Diesel	Aggregated	0.06%	0.04%	0.01	0.44	0.06	0.02	0.12	0.05
T6 Public Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.00%	0.00	0.05	0.01	0.00	0.01	0.00
T6 Public Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.06	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.04	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.01%	0.01%	0.00	0.10	0.01	0.00	0.03	0.01
T6 Public Class 7	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.12	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 Utility Class 5	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.08%	0.06%	0.02	0.18	0.44	0.04	0.16	0.05
T6TS	Electricity	Aggregated	0.10%	0.08%	0.00	0.00	0.00	0.00	0.12	0.04
T7 CAIRP Class 8	Diesel	Aggregated	2.43%	4.01%	2.12	214.57	5.77	2.31	28.09	12.71
T7 CAIRP Class 8	Electricity	Aggregated	0.71%	1.17%	0.00	0.00	0.00	0.00	4.26	1.29
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.03	0.61	0.00	0.03	0.01
T7 NNOOS Class 8	Diesel	Aggregated	3.71%	6.13%	3.15	363.52	8.58	3.38	42.86	19.34
T7 NOOS Class 8	Diesel	Aggregated	1.35%	2.23%	1.18	135.81	3.21	1.23	15.76	7.21
T7 POLA Class 8	Diesel	Aggregated	0.48%	0.79%	0.38	42.14	1.31	0.49	5.45	2.36
T7 POLA Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.57	0.17
T7 POLA Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.02	0.23	4.38	0.00	0.19	0.06
T7 Public Class 8	Diesel	Aggregated	0.02%	0.03%	0.02	1.81	0.07	0.02	0.18	0.07
T7 Public Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.16	0.05
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.02	0.25	4.75	0.00	0.18	0.06
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.02%	0.03%	0.01	0.92	0.04	0.02	0.18	0.07
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.16	0.05
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.29	0.00	0.01	0.00
T7 Single Dump Class 8	Diesel	Aggregated	0.03%	0.05%	0.02	2.36	0.09	0.04	0.36	0.15
T7 Single Dump Class 8	Electricity	Aggregated	0.03%	0.06%	0.00	0.00	0.00	0.00	0.21	0.06
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.03	0.59	0.00	0.02	0.01
T7 Single Other Class 8	Diesel	Aggregated	0.17%	0.27%	0.11	10.68	0.42	0.18	1.78	0.72
T7 Single Other Class 8	Electricity	Aggregated	0.19%	0.32%	0.00	0.00	0.00	0.00	1.19	0.36
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.02%	0.01	0.15	2.96	0.00	0.11	0.04
T7 SWCV Class 8	Diesel	Aggregated	0.00%	0.00%	0.00	0.70	0.00	0.01	0.06	0.03
T7 SWCV Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	1.01	0.33
T7 SWCV Class 8	Natural Gas	Aggregated	0.11%	0.18%	0.06	1.76	52.21	0.00	2.18	0.73
T7 Tractor Class 8	Diesel	Aggregated	0.84%	1.39%	0.67	71.87	2.09	0.80	9.48	4.10
T7 Tractor Class 8	Electricity	Aggregated	0.18%	0.30%	0.00	0.00	0.00	0.00	1.10	0.33
T7 Tractor Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.02	0.22	4.09	0.00	0.17	0.06
T7 Utility Class 8	Diesel	Aggregated	0.00%	0.01%	0.00	0.27	0.01	0.01	0.05	0.02
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.01	0.05	0.53	0.00	0.00	0.00
T7IS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	0.01	0.41	0.00	0.08	0.03
UBUS	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.62	0.20
UBUS	Natural Gas	Aggregated	0.01%	0.02%	0.03	0.10	0.05	0.00	0.08	0.03
			TOTAL		29.06	946.39	2,006.37	17.87	184.87	72.61
			MDAQMD Daily Thresholds		137	137	548	137	82	65
			Exceeds Daily Thresholds?		No	Yes	Yes	No	Yes	Yes

Year 2048 Existing: Criteria Air Pollutants - Annual Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴
Fleet Mix Percentage	18.0%	1.5%	1.68%	78.77%
EMFAC Default	10.92%	2.00%	3.03%	84.05%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this anlsys: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this anlsys: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this anlsys: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this anlsys: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	2,177,250
Days per year ¹	347
Annual VMT	755,505,659

Source: Fehr & Peers, 2025

¹ Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/appendices_volume2.pdf

Emission year										
Year 2048										
lbs/day										
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.00	0.14	0.01	0.00	0.01	0.00
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.00	0.00	0.11	0.00	0.00	0.00
LDA	Gasoline	Aggregated	39.09%	36.64%	0.85	5.81	147.26	0.69	4.65	0.61
LDA	Diesel	Aggregated	0.02%	0.02%	0.00	0.00	0.02	0.00	0.00	0.00
LDA	Electricity	Aggregated	5.06%	4.75%	0.00	0.00	0.00	0.00	0.49	0.08
LDA	Plug-in Hybrid	Aggregated	1.84%	1.72%	0.02	0.04	2.58	0.02	0.17	0.03
LDT1	Gasoline	Aggregated	2.44%	2.29%	0.06	0.39	9.83	0.05	0.31	0.04
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0.00	0.01	0.00
LDT1	Plug-in Hybrid	Aggregated	0.06%	0.06%	0.00	0.00	0.08	0.00	0.01	0.00
LDT2	Gasoline	Aggregated	20.62%	19.33%	0.62	3.46	91.30	0.43	2.63	0.32
LDT2	Diesel	Aggregated	0.08%	0.07%	0.01	0.02	0.07	0.00	0.01	0.00
LDT2	Electricity	Aggregated	0.58%	0.55%	0.00	0.00	0.00	0.00	0.06	0.01
LDT2	Plug-in Hybrid	Aggregated	0.57%	0.54%	0.00	0.01	0.80	0.00	0.05	0.01
LHD1	Gasoline	Aggregated	0.75%	0.42%	0.01	0.06	2.19	0.02	0.30	0.01
LHD1	Diesel	Aggregated	0.51%	0.28%	0.08	0.44	0.16	0.01	0.24	0.01
LHD1	Electricity	Aggregated	1.15%	0.63%	0.00	0.00	0.00	0.00	0.25	0.01
LHD2	Gasoline	Aggregated	0.09%	0.05%	0.00	0.01	0.27	0.00	0.04	0.00
LHD2	Diesel	Aggregated	0.25%	0.14%	0.06	0.34	0.11	0.01	0.13	0.00
LHD2	Electricity	Aggregated	0.28%	0.16%	0.00	0.00	0.00	0.00	0.07	0.00
MCY	Gasoline	Aggregated	0.26%	0.24%	1.52	0.92	18.59	0.00	0.04	0.00
MDV	Gasoline	Aggregated	12.29%	11.51%	0.39	2.16	56.44	0.31	1.58	0.19
MDV	Diesel	Aggregated	0.13%	0.13%	0.00	0.02	0.14	0.00	0.02	0.00
MDV	Electricity	Aggregated	0.54%	0.51%	0.00	0.00	0.00	0.00	0.05	0.01
MDV	Plug-in Hybrid	Aggregated	0.37%	0.35%	0.00	0.01	0.52	0.00	0.03	0.01
MH	Gasoline	Aggregated	0.03%	0.02%	0.00	0.04	0.03	0.00	0.01	0.00
MH	Diesel	Aggregated	0.02%	0.01%	0.00	0.21	0.01	0.00	0.01	0.00
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.00	0.14	0.01	0.00	0.02	0.00
OBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	0.04	0.03	0.00	0.01	0.00
OBUS	Electricity	Aggregated	0.02%	0.03%	0.00	0.00	0.00	0.00	0.01	0.00
PTO	Diesel	Aggregated	0.05%	0.08%	0.01	1.51	0.11	0.01	0.00	0.00
PTO	Electricity	Aggregated	0.05%	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	0.02	0.04	0.00	0.01	0.00
SBUS	Diesel	Aggregated	0.01%	0.02%	0.00	0.07	0.01	0.00	0.01	0.00
SBUS	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.01	0.00
SBUS	Natural Gas	Aggregated	0.01%	0.01%	0.00	0.02	0.96	0.00	0.01	0.00
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	Aggregated	0.06%	0.05%	0.00	0.07	0.01	0.00	0.02	0.00
T6 CAIRP Class 7	Electricity	Aggregated	0.02%	0.02%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	Aggregated	0.02%	0.02%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 4	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	Aggregated	0.03%	0.02%	0.00	0.03	0.01	0.00	0.01	0.00
T6 Instate Delivery Class 5	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	Aggregated	0.11%	0.08%	0.00	0.13	0.02	0.01	0.04	0.00
T6 Instate Delivery Class 6	Electricity	Aggregated	0.14%	0.10%	0.00	0.00	0.00	0.00	0.03	0.00
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 7	Diesel	Aggregated	0.04%	0.03%	0.00	0.08	0.01	0.00	0.02	0.00
T6 Instate Delivery Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 4	Diesel	Aggregated	0.06%	0.04%	0.00	0.07	0.01	0.00	0.02	0.00
T6 Instate Other Class 4	Electricity	Aggregated	0.08%	0.06%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	Aggregated	0.14%	0.11%	0.00	0.17	0.03	0.01	0.05	0.00
T6 Instate Other Class 5	Electricity	Aggregated	0.19%	0.14%	0.00	0.00	0.00	0.00	0.04	0.00
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 6	Diesel	Aggregated	0.12%	0.09%	0.00	0.15	0.02	0.01	0.05	0.00
T6 Instate Other Class 6	Electricity	Aggregated	0.16%	0.12%	0.00	0.00	0.00	0.00	0.03	0.00
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Other Class 7	Diesel	Aggregated	0.10%	0.08%	0.00	0.18	0.02	0.01	0.04	0.00
T6 Instate Other Class 7	Electricity	Aggregated	0.09%	0.07%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	Aggregated	0.10%	0.08%	0.00	0.17	0.02	0.01	0.04	0.00
T6 Instate Tractor Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 OOS Class 6	Diesel	Aggregated	0.01%	0.01%	0.00	0.01	0.00	0.00	0.00	0.00

T6 OOS Class 7	Diesel	Aggregated	0.06%	0.04%	0.00	0.08	0.01	0.00	0.02	0.00
T6 Public Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Diesel	Aggregated	0.01%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.01	0.00	0.00	0.00	0.00
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Public Class 7	Diesel	Aggregated	0.01%	0.01%	0.00	0.02	0.00	0.00	0.00	0.00
T6 Public Class 7	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6 Utility Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	Aggregated	0.08%	0.06%	0.00	0.03	0.08	0.01	0.03	0.00
T6TS	Electricity	Aggregated	0.10%	0.08%	0.00	0.00	0.00	0.00	0.02	0.00
T7 CAIRP Class 8	Diesel	Aggregated	2.43%	4.01%	0.37	37.23	1.00	0.40	4.87	0.30
T7 CAIRP Class 8	Electricity	Aggregated	0.71%	1.17%	0.00	0.00	0.00	0.00	0.74	0.09
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.11	0.00	0.00	0.00
T7 NNOOS Class 8	Diesel	Aggregated	3.71%	6.13%	0.55	63.07	1.49	0.59	7.44	0.46
T7 NOOS Class 8	Diesel	Aggregated	1.35%	2.23%	0.20	23.56	0.56	0.21	2.73	0.17
T7 POLA Class 8	Diesel	Aggregated	0.48%	0.79%	0.07	7.31	0.23	0.08	0.95	0.06
T7 POLA Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.10	0.01
T7 POLA Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.00	0.04	0.76	0.00	0.03	0.00
T7 Public Class 8	Diesel	Aggregated	0.02%	0.03%	0.00	0.31	0.01	0.00	0.03	0.00
T7 Public Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.03	0.00
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.00	0.04	0.82	0.00	0.03	0.00
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.02%	0.03%	0.00	0.16	0.01	0.00	0.03	0.00
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0.00	0.03	0.00
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.00	0.05	0.00	0.00	0.00
T7 Single Dump Class 8	Diesel	Aggregated	0.03%	0.05%	0.00	0.41	0.02	0.01	0.06	0.00
T7 Single Dump Class 8	Electricity	Aggregated	0.03%	0.06%	0.00	0.00	0.00	0.00	0.04	0.00
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.01	0.10	0.00	0.00	0.00
T7 Single Other Class 8	Diesel	Aggregated	0.17%	0.27%	0.02	1.85	0.07	0.03	0.31	0.02
T7 Single Other Class 8	Electricity	Aggregated	0.19%	0.32%	0.00	0.00	0.00	0.00	0.21	0.02
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.02%	0.00	0.03	0.51	0.00	0.02	0.00
T7 SWCV Class 8	Diesel	Aggregated	0.00%	0.00%	0.00	0.12	0.00	0.00	0.01	0.00
T7 SWCV Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.17	0.01
T7 SWCV Class 8	Natural Gas	Aggregated	0.11%	0.18%	0.01	0.31	9.06	0.00	0.38	0.01
T7 Tractor Class 8	Diesel	Aggregated	0.84%	1.39%	0.12	12.47	0.36	0.14	1.64	0.10
T7 Tractor Class 8	Electricity	Aggregated	0.18%	0.30%	0.00	0.00	0.00	0.00	0.19	0.02
T7 Tractor Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.00	0.04	0.71	0.00	0.03	0.00
T7 Utility Class 8	Diesel	Aggregated	0.00%	0.01%	0.00	0.05	0.00	0.00	0.01	0.00
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.01%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.00	0.01	0.09	0.00	0.00	0.00
T7IS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	0.00	0.07	0.00	0.01	0.00
UBUS	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0.00	0.11	0.01
UBUS	Natural Gas	Aggregated	0.01%	0.02%	0.01	0.02	0.01	0.00	0.01	0.00
			TOTAL		5.04	164.20	348.10	3.10	32.07	2.71
			MDAQMD Daily Thresholds		25	25	100	25	15	12
			Exceeds Daily Thresholds?		No	Yes	Yes	No	Yes	No

Year 2023 Existing: GHG Emissions - Annual Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴	
Fleet Mix Percentage	12.5%	1.1%	1.34%	85.07%	
EMFAC Default	6.69%	1.48%	3.58%	88.25%	100.00%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this anslysis: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this anslysis: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this anslysis: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this anslysis: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	1,339,563
Days per year ¹	347
Annual VMT	464,828,299

Source: Fehr & Peers, 2025

¹ Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/appendices_volume2.pdf

Emission year					N ₂ O	CO ₂ (Pavley)	CH ₄	CO ₂ e w/ Pavley + LCFS
					AR5 GWP	AR5 GWP	AR5 GWP	
Year 2023					265	1	28	
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	N ₂ O	CO ₂ (Pavley)	CH ₄	
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.02	156.79	0.00	163
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.00	20.71	0.01	22
LDA	Gasoline	Aggregated	47.36%	45.65%	1.05	61,334.48	0.56	61,629
LDA	Diesel	Aggregated	0.11%	0.11%	0.02	120.40	0.00	125
LDA	Electricity	Aggregated	1.81%	1.75%	0.00	0.00	0.00	0
LDA	Plug-in Hybrid	Aggregated	1.36%	1.31%	0.00	839.89	0.00	841
LDT1	Gasoline	Aggregated	3.59%	3.46%	0.23	5,587.77	0.17	5,654
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	1.16	0.00	1
LDT1	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
LDT1	Plug-in Hybrid	Aggregated	0.00%	0.00%	0.00	2.30	0.00	2
LDT2	Gasoline	Aggregated	18.85%	18.17%	0.58	30,146.83	0.29	30,310
LDT2	Diesel	Aggregated	0.06%	0.05%	0.01	80.66	0.00	84
LDT2	Electricity	Aggregated	0.07%	0.07%	0.00	0.00	0.00	0
LDT2	Plug-in Hybrid	Aggregated	0.15%	0.15%	0.00	88.91	0.00	89
LHD1	Gasoline	Aggregated	1.60%	0.60%	0.04	1,799.76	0.02	1,810
LHD1	Diesel	Aggregated	1.22%	0.45%	0.16	1,040.26	0.01	1,084
LHD2	Gasoline	Aggregated	0.24%	0.09%	0.00	301.02	0.00	302
LHD2	Diesel	Aggregated	0.52%	0.20%	0.08	538.42	0.00	561
MCY	Gasoline	Aggregated	0.33%	0.32%	0.06	280.64	0.27	304
MDV	Gasoline	Aggregated	14.17%	13.65%	0.64	27,927.11	0.35	28,108
MDV	Diesel	Aggregated	0.21%	0.21%	0.07	417.46	0.00	435
MDV	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0
MDV	Plug-in Hybrid	Aggregated	0.10%	0.09%	0.00	58.94	0.00	59
MH	Gasoline	Aggregated	0.09%	0.06%	0.01	532.67	0.00	535
MH	Diesel	Aggregated	0.03%	0.02%	0.02	113.79	0.00	119
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.03	178.15	0.00	186
OBUS	Gasoline	Aggregated	0.05%	0.09%	0.01	708.03	0.01	711
PTO	Diesel	Aggregated	0.07%	0.12%	0.19	1,193.80	0.00	1,244
PTO	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
SBUS	Gasoline	Aggregated	0.03%	0.05%	0.01	219.77	0.00	222
SBUS	Diesel	Aggregated	0.03%	0.06%	0.06	355.01	0.00	370
SBUS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
SBUS	Natural Gas	Aggregated	0.01%	0.03%	0.04	203.34	0.52	229
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	9.39	0.00	10
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	12.86	0.00	13
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.01%	0.01	33.07	0.00	34
T6 CAIRP Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 CAIRP Class 7	Diesel	Aggregated	0.05%	0.04%	0.03	196.00	0.00	204
T6 CAIRP Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.03	0.00	0
T6 Instate Delivery Class 4	Diesel	Aggregated	0.03%	0.02%	0.02	124.87	0.00	130
T6 Instate Delivery Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.28	0.00	0
T6 Instate Delivery Class 5	Diesel	Aggregated	0.04%	0.03%	0.02	148.30	0.00	154
T6 Instate Delivery Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.26	0.00	0
T6 Instate Delivery Class 6	Diesel	Aggregated	0.16%	0.12%	0.09	591.88	0.00	617
T6 Instate Delivery Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	1.19	0.00	1
T6 Instate Delivery Class 7	Diesel	Aggregated	0.05%	0.03%	0.03	170.15	0.00	177
T6 Instate Delivery Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	3.19	0.00	3
T6 Instate Other Class 4	Diesel	Aggregated	0.09%	0.06%	0.05	329.73	0.00	344
T6 Instate Other Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.64	0.00	1
T6 Instate Other Class 5	Diesel	Aggregated	0.21%	0.16%	0.13	814.34	0.00	848
T6 Instate Other Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	1.34	0.00	1
T6 Instate Other Class 6	Diesel	Aggregated	0.18%	0.14%	0.11	692.19	0.00	721

T6 Instate Other Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	1.13	0.00	1
T6 Instate Other Class 7	Diesel	Aggregated	0.12%	0.09%	0.07	442.86	0.00	461
T6 Instate Other Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	8.77	0.00	9
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	8.18	0.00	9
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0
T6 Instate Tractor Class 7	Diesel	Aggregated	0.08%	0.06%	0.05	286.26	0.00	298
T6 Instate Tractor Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	5.33	0.00	6
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	5.33	0.00	6
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	7.30	0.00	8
T6 OOS Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	18.77	0.00	20
T6 OOS Class 7	Diesel	Aggregated	0.04%	0.03%	0.02	128.41	0.00	134
T6 Public Class 4	Diesel	Aggregated	0.01%	0.00%	0.00	23.97	0.00	25
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	1.10	0.00	1
T6 Public Class 5	Diesel	Aggregated	0.01%	0.01%	0.01	43.97	0.00	46
T6 Public Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	5.21	0.00	6
T6 Public Class 6	Diesel	Aggregated	0.01%	0.01%	0.01	34.52	0.00	36
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	2.49	0.00	3
T6 Public Class 7	Diesel	Aggregated	0.03%	0.02%	0.02	96.04	0.00	100
T6 Public Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	6.28	0.00	7
T6 Utility Class 5	Diesel	Aggregated	0.01%	0.01%	0.01	42.30	0.00	44
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.16	0.00	0
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	7.92	0.00	8
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.06	0.00	0
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	11.06	0.00	12
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.09	0.00	0
T6TS	Gasoline	Aggregated	0.21%	0.15%	0.02	1,174.14	0.01	1,179
T7 CAIRP Class 8	Diesel	Aggregated	1.80%	3.36%	3.81	24,160.40	0.01	25,169
T7 CAIRP Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	23.83	0.02	26
T7 NNOOS Class 8	Diesel	Aggregated	2.13%	3.98%	4.50	28,565.61	0.01	29,759
T7 NOOS Class 8	Diesel	Aggregated	0.77%	1.45%	1.63	10,365.81	0.00	10,799
T7 POLA Class 8	Diesel	Aggregated	0.45%	0.83%	1.00	6,321.09	0.00	6,585
T7 POLA Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 POLA Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.01	49.02	0.04	53
T7 Public Class 8	Diesel	Aggregated	0.05%	0.09%	0.11	728.29	0.00	759
T7 Public Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.03	156.00	0.12	168
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.04%	0.08%	0.10	624.12	0.00	650
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.01	36.28	0.03	39
T7 Single Dump Class 8	Diesel	Aggregated	0.07%	0.13%	0.16	995.14	0.00	1,037
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.01%	0.01	44.88	0.03	48
T7 Single Other Class 8	Diesel	Aggregated	0.20%	0.37%	0.44	2,788.32	0.00	2,905
T7 Single Other Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.03%	0.03	139.13	0.11	150
T7 SWCV Class 8	Diesel	Aggregated	0.05%	0.09%	0.25	1,606.13	0.00	1,673
T7 SWCV Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 SWCV Class 8	Natural Gas	Aggregated	0.17%	0.31%	0.34	1,686.95	3.36	1,872
T7 Tractor Class 8	Diesel	Aggregated	0.58%	1.09%	1.24	7,839.35	0.00	8,167
T7 Tractor Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7 Tractor Class 8	Natural Gas	Aggregated	0.01%	0.03%	0.03	151.56	0.11	163
T7 Utility Class 8	Diesel	Aggregated	0.01%	0.02%	0.02	128.91	0.00	134
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.00	12.45	0.00	13
UBUS	Gasoline	Aggregated	0.02%	0.03%	0.00	194.07	0.00	195
UBUS	Diesel	Aggregated	0.00%	0.00%	0.00	9.47	0.00	10
UBUS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
UBUS	Natural Gas	Aggregated	0.07%	0.13%	0.23	1,120.43	1.27	1,217
					18.01	227,486.68	7.38	232,465.05

Year 2048 Proposed Project: GHG Emissions - Annual Emissions

Based on EMFAC2021, Version 1.0.2., San Bernardino County

	Heavy-Heavy Duty Vehicles ¹	Medium-Heavy Duty Trucks ²	Light Heavy Duty Trucks ³	Passenger Vehicles & Light Duty Vehicles ⁴	
Fleet Mix Percentage	18.0%	1.5%	1.68%	78.77%	
EMFAC Default	10.92%	2.00%	3.03%	84.05%	100.00%

Source: Fehr & Peers, 2025

¹ Consist of the following EMFAC vehicle categories for purposes of this anslysis: All Other Buses, Motor Coach, OBUS, PTO, SBUS, T7, and UBUS.

² Consist of the following EMFAC vehicle categories for purposes of this anslysis: MH and T6.

³ Consist of the following EMFAC vehicle categories for purposes of this anslysis: LHD1 and LHD2.

² Consist of the following EMFAC vehicle categories for purposes of this anslysis: LDA, LDT1, LDT2, MCY, and MDV.

Daily VMT	2,177,250
Days per year ¹	347
Annual VMT	755,505,659

Source: Fehr & Peers, 2025

¹ Adjusted Daily vehicles miles traveled (VMT) multiplied by 347 days/year to account for reduced traffic on weekends and holidays. This assumption is consistent with the California Air Resources Board's (CARB) methodology within the Climate Change Scoping Plan Measure Documentation Supplement. https://ww2.arb.ca.gov/sites/default/files/classic/cc/scopingplan/document/appendices_volume2.pdf

Emission year					N ₂ O	CO ₂ (Pavley)	CH ₄	
					AR5 GWP	AR5 GWP	AR5 GWP	
Year 2048					265	1	28	
Vehicle Type	Fuel Type	Speed	Percent of VMT	Adjusted Percent VMT	N ₂ O	CO ₂ (Pavley)	CH ₄	CO ₂ e w/ Pavley + LCFS
All Other Buses	Diesel	Aggregated	0.02%	0.03%	0.03	181.36	0.00	189
All Other Buses	Natural Gas	Aggregated	0.00%	0.01%	0.01	32.54	0.03	35
LDA	Gasoline	Aggregated	39.09%	36.64%	0.88	62,868.52	0.27	63,110
LDA	Diesel	Aggregated	0.02%	0.02%	0.00	29.68	0.00	31
LDA	Electricity	Aggregated	5.06%	4.75%	0.00	0.00	0.00	0
LDA	Plug-in Hybrid	Aggregated	1.84%	1.72%	0.01	1,441.61	0.00	1,443
LDT1	Gasoline	Aggregated	2.44%	2.29%	0.06	4,530.12	0.02	4,546
LDT1	Diesel	Aggregated	0.00%	0.00%	0.00	0.07	0.00	0
LDT1	Electricity	Aggregated	0.08%	0.07%	0.00	0.00	0.00	0
LDT1	Plug-in Hybrid	Aggregated	0.06%	0.06%	0.00	46.79	0.00	47
LDT2	Gasoline	Aggregated	20.62%	19.33%	0.49	39,639.74	0.19	39,775
LDT2	Diesel	Aggregated	0.08%	0.07%	0.02	140.99	0.00	147
LDT2	Electricity	Aggregated	0.58%	0.55%	0.00	0.00	0.00	0
LDT2	Plug-in Hybrid	Aggregated	0.57%	0.54%	0.00	446.98	0.00	447
LHD1	Gasoline	Aggregated	0.75%	0.42%	0.01	1,524.09	0.00	1,526
LHD1	Diesel	Aggregated	0.51%	0.28%	0.15	983.42	0.00	1,025
LHD1	Electricity	Aggregated	1.15%	0.63%	0.00	0.00	0.00	0
LHD2	Gasoline	Aggregated	0.09%	0.05%	0.00	206.32	0.00	207
LHD2	Diesel	Aggregated	0.25%	0.14%	0.09	555.40	0.00	579
LHD2	Electricity	Aggregated	0.28%	0.16%	0.00	0.00	0.00	0
MCY	Gasoline	Aggregated	0.26%	0.24%	0.06	337.08	0.23	361
MDV	Gasoline	Aggregated	12.29%	11.51%	0.30	28,610.40	0.12	28,694
MDV	Diesel	Aggregated	0.13%	0.13%	0.05	314.82	0.00	328
MDV	Electricity	Aggregated	0.54%	0.51%	0.00	0.00	0.00	0
MDV	Plug-in Hybrid	Aggregated	0.37%	0.35%	0.00	290.31	0.00	291
MH	Gasoline	Aggregated	0.03%	0.02%	0.00	334.24	0.00	335
MH	Diesel	Aggregated	0.02%	0.01%	0.02	106.77	0.00	111
Motor Coach	Diesel	Aggregated	0.01%	0.02%	0.03	205.56	0.00	214
OBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	226.80	0.00	227
OBUS	Electricity	Aggregated	0.02%	0.03%	0.00	0.00	0.00	0
PTO	Diesel	Aggregated	0.05%	0.08%	0.15	983.06	0.00	1,024
PTO	Electricity	Aggregated	0.05%	0.08%	0.00	0.00	0.00	0
SBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	133.64	0.00	134
SBUS	Diesel	Aggregated	0.01%	0.02%	0.03	167.82	0.00	175
SBUS	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0
SBUS	Natural Gas	Aggregated	0.01%	0.01%	0.03	142.03	0.31	158
T6 CAIRP Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	8.64	0.00	9
T6 CAIRP Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 CAIRP Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	11.87	0.00	12
T6 CAIRP Class 5	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 CAIRP Class 6	Diesel	Aggregated	0.01%	0.00%	0.00	30.92	0.00	32
T6 CAIRP Class 6	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0
T6 CAIRP Class 7	Diesel	Aggregated	0.06%	0.05%	0.05	325.02	0.00	339
T6 CAIRP Class 7	Electricity	Aggregated	0.02%	0.02%	0.00	0.00	0.00	0
T6 CAIRP Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.04	0.00	0
T6 Instate Delivery Class 4	Diesel	Aggregated	0.02%	0.02%	0.02	129.91	0.00	135
T6 Instate Delivery Class 4	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0
T6 Instate Delivery Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.72	0.00	1
T6 Instate Delivery Class 5	Diesel	Aggregated	0.03%	0.02%	0.02	151.44	0.00	158
T6 Instate Delivery Class 5	Electricity	Aggregated	0.03%	0.03%	0.00	0.00	0.00	0
T6 Instate Delivery Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.86	0.00	1
T6 Instate Delivery Class 6	Diesel	Aggregated	0.11%	0.08%	0.10	613.81	0.00	639
T6 Instate Delivery Class 6	Electricity	Aggregated	0.14%	0.10%	0.00	0.00	0.00	0
T6 Instate Delivery Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	3.43	0.00	4
T6 Instate Delivery Class 7	Diesel	Aggregated	0.04%	0.03%	0.04	239.42	0.00	249
T6 Instate Delivery Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0
T6 Instate Delivery Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	4.13	0.00	4
T6 Instate Other Class 4	Diesel	Aggregated	0.06%	0.04%	0.05	331.84	0.00	346
T6 Instate Other Class 4	Electricity	Aggregated	0.08%	0.06%	0.00	0.00	0.00	0
T6 Instate Other Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	1.59	0.00	2
T6 Instate Other Class 5	Diesel	Aggregated	0.14%	0.11%	0.13	811.55	0.00	845

T6 Instate Other Class 5	Electricity	Aggregated	0.19%	0.14%	0.00	0.00	0.00	0
T6 Instate Other Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	4.23	0.00	5
T6 Instate Other Class 6	Diesel	Aggregated	0.12%	0.09%	0.11	697.17	0.00	726
T6 Instate Other Class 6	Electricity	Aggregated	0.16%	0.12%	0.00	0.00	0.00	0
T6 Instate Other Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	3.62	0.00	4
T6 Instate Other Class 7	Diesel	Aggregated	0.10%	0.08%	0.09	573.04	0.00	597
T6 Instate Other Class 7	Electricity	Aggregated	0.09%	0.07%	0.00	0.00	0.00	0
T6 Instate Other Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	9.33	0.01	10
T6 Instate Tractor Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	8.18	0.00	9
T6 Instate Tractor Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Instate Tractor Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.04	0.00	0
T6 Instate Tractor Class 7	Diesel	Aggregated	0.10%	0.08%	0.08	512.62	0.00	534
T6 Instate Tractor Class 7	Electricity	Aggregated	0.03%	0.02%	0.00	0.00	0.00	0
T6 Instate Tractor Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	8.98	0.01	10
T6 OOS Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	11.56	0.00	12
T6 OOS Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	15.86	0.00	17
T6 OOS Class 6	Diesel	Aggregated	0.01%	0.01%	0.01	41.39	0.00	43
T6 OOS Class 7	Diesel	Aggregated	0.06%	0.04%	0.04	271.02	0.00	282
T6 Public Class 4	Diesel	Aggregated	0.00%	0.00%	0.00	15.76	0.00	16
T6 Public Class 4	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Public Class 4	Natural Gas	Aggregated	0.00%	0.00%	0.00	1.84	0.00	2
T6 Public Class 5	Diesel	Aggregated	0.01%	0.00%	0.00	31.20	0.00	32
T6 Public Class 5	Electricity	Aggregated	0.01%	0.00%	0.00	0.00	0.00	0
T6 Public Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	4.07	0.00	4
T6 Public Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	23.27	0.00	24
T6 Public Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Public Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	2.94	0.00	3
T6 Public Class 7	Diesel	Aggregated	0.01%	0.01%	0.01	70.76	0.00	74
T6 Public Class 7	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0
T6 Public Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	9.01	0.01	10
T6 Utility Class 5	Diesel	Aggregated	0.00%	0.00%	0.00	24.35	0.00	25
T6 Utility Class 5	Electricity	Aggregated	0.01%	0.01%	0.00	0.00	0.00	0
T6 Utility Class 5	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.09	0.00	0
T6 Utility Class 6	Diesel	Aggregated	0.00%	0.00%	0.00	4.60	0.00	5
T6 Utility Class 6	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Utility Class 6	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0
T6 Utility Class 7	Diesel	Aggregated	0.00%	0.00%	0.00	6.34	0.00	7
T6 Utility Class 7	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
T6 Utility Class 7	Natural Gas	Aggregated	0.00%	0.00%	0.00	0.02	0.00	0
T6TS	Gasoline	Aggregated	0.08%	0.06%	0.00	644.05	0.00	645
T6TS	Electricity	Aggregated	0.10%	0.08%	0.00	0.00	0.00	0
T7 CAIRP Class 8	Diesel	Aggregated	2.43%	4.01%	6.05	38,426.27	0.02	40,031
T7 CAIRP Class 8	Electricity	Aggregated	0.71%	1.17%	0.00	0.00	0.00	0
T7 CAIRP Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.01	35.24	0.03	38
T7 NNOOS Class 8	Diesel	Aggregated	3.71%	6.13%	8.86	56,252.23	0.02	58,601
T7 NOOS Class 8	Diesel	Aggregated	1.35%	2.23%	3.22	20,426.21	0.01	21,279
T7 POLA Class 8	Diesel	Aggregated	0.48%	0.79%	1.27	8,087.70	0.00	8,425
T7 POLA Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0
T7 POLA Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.05	247.18	0.22	267
T7 Public Class 8	Diesel	Aggregated	0.02%	0.03%	0.05	302.66	0.00	315
T7 Public Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0
T7 Public Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.05	246.76	0.21	266
T7 Single Concrete/Transit Mix Class 8	Diesel	Aggregated	0.02%	0.03%	0.05	305.62	0.00	318
T7 Single Concrete/Transit Mix Class 8	Electricity	Aggregated	0.03%	0.04%	0.00	0.00	0.00	0
T7 Single Concrete/Transit Mix Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.00	16.11	0.01	17
T7 Single Dump Class 8	Diesel	Aggregated	0.03%	0.05%	0.09	591.38	0.00	616
T7 Single Dump Class 8	Electricity	Aggregated	0.03%	0.06%	0.00	0.00	0.00	0
T7 Single Dump Class 8	Natural Gas	Aggregated	0.00%	0.00%	0.01	29.81	0.03	32
T7 Single Other Class 8	Diesel	Aggregated	0.17%	0.27%	0.47	2,957.23	0.00	3,081
T7 Single Other Class 8	Electricity	Aggregated	0.19%	0.32%	0.00	0.00	0.00	0
T7 Single Other Class 8	Natural Gas	Aggregated	0.01%	0.02%	0.03	157.98	0.14	170
T7 SWCV Class 8	Diesel	Aggregated	0.00%	0.00%	0.02	116.81	0.00	122
T7 SWCV Class 8	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0
T7 SWCV Class 8	Natural Gas	Aggregated	0.11%	0.18%	0.26	1,278.81	0.55	1,363
T7 Tractor Class 8	Diesel	Aggregated	0.84%	1.39%	2.09	13,267.16	0.00	13,821
T7 Tractor Class 8	Electricity	Aggregated	0.18%	0.30%	0.00	0.00	0.00	0
T7 Tractor Class 8	Natural Gas	Aggregated	0.02%	0.03%	0.05	228.28	0.20	246
T7 Utility Class 8	Diesel	Aggregated	0.00%	0.01%	0.01	85.24	0.00	89
T7 Utility Class 8	Electricity	Aggregated	0.00%	0.01%	0.00	0.00	0.00	0
T7IS	Gasoline	Aggregated	0.00%	0.00%	0.00	5.62	0.00	6
T7IS	Electricity	Aggregated	0.00%	0.00%	0.00	0.00	0.00	0
UBUS	Gasoline	Aggregated	0.01%	0.02%	0.00	64.09	0.00	64
UBUS	Electricity	Aggregated	0.09%	0.15%	0.00	0.00	0.00	0
UBUS	Natural Gas	Aggregated	0.01%	0.02%	0.01	62.60	0.00	66
					25.88	293,331.65	2.67	300,265.90

Source: EMFAC2021 (v1.0.2) Emission Rates

Region Type: County

Region: San Bernardino

Calendar Year: 2023

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMBW and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

			g/mile																					
Region	Calendar Year	Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNE		PM2.5_PMB		PM2.5_TOTAL	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	VMT Total	% of VMT			
San Bernardino	2023	All Other Buses	Diesel	1.23E-01	2.29E+00	3.67E-01	9.99E-03	7.43E-02	1.20E-02	4.28E-02	1.29E-01	7.11E-02	3.00E-03	1.50E-02	8.91E-02	1.05E+03	5.72E-03	1.66E-01			11,954	0.02%		
San Bernardino	2023	All Other Buses	Natural Gas	7.16E-03	1.31E-01	2.35E+00	0.00E+00	7.47E-04	1.20E-02	4.32E-02	5.59E-02	6.87E-04	3.00E-03	1.51E-02	1.88E-02	8.64E+02	5.01E-01	1.76E-01			1,927	0.00%		
San Bernardino	2023	LDA	Gasoline	9.97E-03	4.56E-02	8.04E-01	2.86E-03	1.32E-03	8.00E-03	6.71E-03	1.60E-02	1.22E-03	2.00E-03	2.35E-03	5.57E-03	2.89E+02	2.62E-03	4.97E-03			33,073,440	47.36%		
San Bernardino	2023	LDA	Diesel	3.02E-02	2.41E-01	3.45E-01	2.30E-03	1.98E-02	8.00E-03	6.63E-03	3.44E-02	1.89E-02	2.00E-03	2.32E-03	2.32E-02	2.43E+02	1.40E-03	3.82E-02			77,366	0.11%		
San Bernardino	2023	LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.36E-03	1.24E-02	0.00E+00	2.00E-03	1.53E-03	3.53E-03	0.00E+00	0.00E+00	0.00E+00			1,265,339	1.81%		
San Bernardino	2023	LDA	Plug-in Hybrid	1.30E-03	3.04E-03	2.23E-01	1.36E-03	7.02E-04	8.00E-03	3.73E-03	1.24E-02	6.46E-04	2.00E-03	1.30E-03	3.95E-03	1.37E+02	4.21E-04	5.77E-04			952,398	1.36%		
San Bernardino	2023	LDT1	Gasoline	4.66E-02	2.16E-01	2.18E+00	3.44E-03	2.42E-03	8.00E-03	8.06E-03	1.85E-02	2.22E-03	2.00E-03	2.82E-03	7.05E-03	3.48E+02	1.03E-02	1.44E-02			2,503,906	3.59%		
San Bernardino	2023	LDT1	Diesel	3.08E-01	1.67E+00	1.98E+00	4.04E-03	2.52E-01	8.00E-03	8.74E-03	2.68E-01	2.41E-01	2.00E-03	3.06E-03	2.46E-01	4.26E+02	1.43E-02	6.72E-02			424	0.00%		
San Bernardino	2023	LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.37E-03	1.24E-02	0.00E+00	2.00E-03	1.53E-03	3.53E-03	0.00E+00	0.00E+00	0.00E+00			3,326	0.00%		
San Bernardino	2023	LDT1	Plug-in Hybrid	1.18E-03	2.76E-03	2.03E-01	1.23E-03	4.17E-04	8.00E-03	3.77E-03	1.22E-02	3.83E-04	2.00E-03	1.32E-03	3.70E-03	1.25E+02	3.78E-04	5.15E-04			2,872	0.00%		
San Bernardino	2023	LDT2	Gasoline	1.38E-02	8.60E-02	9.76E-01	3.53E-03	1.35E-03	8.00E-03	7.67E-03	1.70E-02	1.24E-03	2.00E-03	2.69E-03	5.93E-03	3.57E+02	3.46E-03	6.91E-03			13,160,213	18.85%		
San Bernardino	2023	LDT2	Diesel	1.42E-02	6.21E-02	1.24E-01	3.01E-03	6.55E-03	8.00E-03	7.35E-03	2.19E-02	6.26E-03	2.00E-03	2.57E-03	1.08E-02	3.18E+02	6.59E-04	5.00E-02			39,572	0.06%		
San Bernardino	2023	LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.36E-03	1.24E-02	0.00E+00	2.00E-03	1.52E-03	3.52E-03	0.00E+00	0.00E+00	0.00E+00			49,491	0.07%		
San Bernardino	2023	LDT2	Plug-in Hybrid	1.22E-03	2.87E-03	2.11E-01	1.28E-03	5.29E-04	8.00E-03	3.75E-03	1.23E-02	4.86E-04	2.00E-03	1.31E-03	3.80E-03	1.30E+02	3.93E-04	5.36E-04			106,792	0.15%		
San Bernardino	2023	LHD1	Gasoline	3.59E-02	2.30E-01	1.37E+00	6.41E-03	1.29E-03	8.00E-03	7.80E-02	8.73E-02	1.18E-03	2.00E-03	2.73E-02	3.05E-02	6.48E+02	7.15E-03	1.26E-02			1,119,164	1.60%		
San Bernardino	2023	LHD1	Diesel	1.20E-01	2.23E+00	4.22E-01	4.68E-03	3.09E-02	1.20E-02	7.80E-02	1.21E-01	2.96E-02	3.00E-03	2.73E-02	5.99E-02	4.94E+02	5.56E-03	7.78E-02			848,722	1.22%		
San Bernardino	2023	LHD2	Gasoline	1.88E-02	1.82E-01	8.86E-01	7.14E-03	1.05E-03	8.00E-03	9.10E-02	1.00E-01	9.70E-04	2.00E-03	3.19E-02	3.48E-02	7.22E+02	4.05E-03	1.11E-02			167,949	0.24%		
San Bernardino	2023	LHD2	Diesel	1.01E-01	1.62E+00	3.02E-01	5.62E-03	2.70E-02	1.20E-02	9.10E-02	1.30E-01	2.59E-02	3.00E-03	3.19E-02	6.07E-02	5.93E+02	4.70E-03	9.34E-02			366,080	0.52%		
San Bernardino	2023	MCY	Gasoline	1.21E+00	6.28E-01	1.46E+01	1.89E-03	1.86E-03	4.00E-03	1.20E-02	1.79E-02	1.74E-03	1.00E-03	4.20E-03	6.94E-03	1.91E+02	1.80E-01	4.20E-02			229,041	0.33%		
San Bernardino	2023	MDV	Gasoline	2.33E-02	1.46E-01	1.28E+00	4.35E-03	1.44E-03	8.00E-03	7.96E-03	1.74E-02	1.33E-03	2.00E-03	2.78E-03	6.11E-03	4.40E+02	5.44E-03	1.02E-02			9,891,875	14.17%		
San Bernardino	2023	MDV	Diesel	1.71E-02	1.73E-01	2.62E-01	4.15E-03	9.65E-03	8.00E-03	7.80E-03	2.54E-02	9.23E-03	2.00E-03	2.73E-03	1.40E-02	4.38E+02	7.93E-04	6.90E-02			148,545	0.21%		
San Bernardino	2023	MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.35E-03	1.24E-02	0.00E+00	2.00E-03	1.52E-03	3.52E-03	0.00E+00	0.00E+00	0.00E+00			53,974	0.08%		
San Bernardino	2023	MDV	Plug-in Hybrid	1.28E-03	2.99E-03	2.19E-01	1.33E-03	7.11E-04	8.00E-03	3.74E-03	1.24E-02	6.54E-04	2.00E-03	1.31E-03	3.96E-03	1.35E+02	4.11E-04	5.60E-04			68,037	0.10%		
San Bernardino	2023	MH	Gasoline	5.91E-02	4.52E-01	1.83E+00	1.76E-02	1.30E-03	1.20E-02	4.21E-02	5.54E-02	1.20E-03	3.00E-03	1.47E-02	1.89E-02	1.78E+03	1.35E-02	2.70E-02			60,515	0.09%		
San Bernardino	2023	MH	Diesel	8.12E-02	4.47E+00	3.54E-01	9.30E-03	1.59E-01	1.60E-02	4.21E-02	2.17E-01	1.52E-01	4.00E-03	1.47E-02	1.71E-01	9.81E+02	3.77E-03	1.55E-01			23,418	0.03%		
San Bernardino	2023	Motor Coach	Diesel	1.42E-02	1.66E+00	9.18E-02	1.66E-02	2.34E-02	1.20E-02	8.11E-02	1.16E-01	2.24E-02	3.00E-03	2.84E-02	5.37E-02	1.75E+03	6.58E-04	2.76E-01			8,165	0.01%		
San Bernardino	2023	OBUS	Gasoline	7.11E-02	5.96E-01	1.82E+00	1.67E-02	8.50E-04	1.20E-02	4.24E-02	5.53E-02	7.82E-04	3.00E-03	1.48E-02	1.86E-02	1.69E+03	1.44E-02	2.74E-02			33,649	0.05%		
San Bernardino	2023	PTO	Diesel	2.29E-02	2.93E+00	2.55E-01	1.96E-02	4.93E-03	0.00E+00	0.00E+00	4.93E-03	4.71E-03	0.00E+00	0.00E+00	4.71E-03	2.07E+03	1.07E-03	3.26E-01			46,361	0.07%		
San Bernardino	2023	PTO	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			19	0.00%		
San Bernardino	2023	SBUS	Gasoline	7.42E-02	5.39E-01	1.49E+00	8.89E-03	1.22E-03	8.00E-03	4.68E-02	5.61E-02	1.12E-03	2.00E-03	1.64E-02	1.95E-02	9.00E+02	1.50E-02	2.86E-02			19,637	0.03%		
San Bernardino	2023	SBUS	Diesel	9.57E-02	5.23E+00	2.45E-01	1.19E-02	3.16E-02	1.20E-02	4.68E-02	9.05E-02	3.03E-02	3.00E-03	1.64E-02	4.97E-02	1.26E+03	4.44E-03	1.98E-01			22,681	0.03%		
San Bernardino	2023	SBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.34E-02	3.54E-02	0.00E+00	3.00E-03	8.20E-03	1.12E-02	0.00E+00	0.00E+00	0.00E+00			11	0.00%		
San Bernardino	2023	SBUS	Natural Gas	6.13E-02	6.95E-01	1.42E+01	0.00E+00	4.48E-03	1.20E-02	4.68E-02	6.33E-02	4.12E-03	3.00E-03	1.64E-02	2.35E-02	1.67E+03	4.29E+00	3.41E-01			9,783	0.01%		
San Bernardino	2023	T6 CAIRP Class 4	Diesel	1.05E-02	4.53E-01	4.09E-02	1.07E-02	9.00E-03	1.20E-02	4.18E-02	6.28E-02	8.61E-03	3.00E-03	1.46E-02	2.62E-02	1.13E+03	4.87E-04	1.77E-01			1,684	0.00%		
San Bernardino	2023	T6 CAIRP Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.09E-02	3.29E-02	0.00E+00	3.00E-03	7.32E-03	1.0									

San Bernardino	2023 T6 OOS Class 6	Diesel	1.06E-02	4.37E-01	4.09E-02	1.05E-02	8.94E-03	1.20E-02	4.18E-02	6.28E-02	8.55E-03	3.00E-03	1.46E-02	2.62E-02	1.11E+03	4.92E-04	1.74E-01	3,428	0.00%
San Bernardino	2023 T6 OOS Class 7	Diesel	6.14E-03	4.35E-01	3.17E-02	9.85E-03	7.04E-03	1.20E-02	4.18E-02	6.09E-02	6.73E-03	3.00E-03	1.46E-02	2.44E-02	1.04E+03	2.85E-04	1.64E-01	24,928	0.04%
San Bernardino	2023 T6 Public Class 4	Diesel	3.51E-02	5.21E+00	1.17E-01	1.03E-02	2.64E-02	1.20E-02	4.22E-02	8.06E-02	2.52E-02	3.00E-03	1.48E-02	4.30E-02	1.09E+03	1.63E-03	1.71E-01	4,456	0.01%
San Bernardino	2023 T6 Public Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.37E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	0	0.00%
San Bernardino	2023 T6 Public Class 4	Natural Gas	6.78E-03	7.66E-02	1.76E+00	0.00E+00	8.81E-04	1.20E-02	4.23E-02	5.52E-02	8.10E-04	3.00E-03	1.48E-02	1.86E-02	7.71E+02	4.75E-01	1.57E-01	287	0.00%
San Bernardino	2023 T6 Public Class 5	Diesel	1.73E-02	2.15E+00	6.59E-02	1.04E-02	1.37E-02	1.20E-02	4.22E-02	6.79E-02	1.31E-02	3.00E-03	1.48E-02	3.08E-02	1.10E+03	8.05E-04	1.73E-01	8,093	0.01%
San Bernardino	2023 T6 Public Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.38E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	0	0.00%
San Bernardino	2023 T6 Public Class 5	Natural Gas	6.29E-03	1.12E-01	2.04E+00	0.00E+00	6.98E-04	1.20E-02	4.23E-02	5.50E-02	6.41E-04	3.00E-03	1.48E-02	1.84E-02	7.86E+02	4.40E-01	1.60E-01	1,337	0.00%
San Bernardino	2023 T6 Public Class 6	Diesel	4.10E-02	4.90E+00	1.25E-01	1.04E-02	3.04E-02	1.20E-02	4.22E-02	8.47E-02	2.91E-02	3.00E-03	1.48E-02	4.69E-02	1.09E+03	1.90E-03	1.72E-01	6,369	0.01%
San Bernardino	2023 T6 Public Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.39E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	2	0.00%
San Bernardino	2023 T6 Public Class 6	Natural Gas	6.73E-03	8.57E-02	1.85E+00	0.00E+00	8.57E-04	1.20E-02	4.23E-02	5.52E-02	7.88E-04	3.00E-03	1.48E-02	1.86E-02	7.85E+02	4.71E-01	1.60E-01	640	0.00%
San Bernardino	2023 T6 Public Class 7	Diesel	4.48E-02	5.01E+00	1.33E-01	1.04E-02	3.47E-02	1.20E-02	4.22E-02	8.89E-02	3.32E-02	3.00E-03	1.48E-02	5.10E-02	1.10E+03	2.08E-03	1.73E-01	17,622	0.03%
San Bernardino	2023 T6 Public Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.39E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	7	0.00%
San Bernardino	2023 T6 Public Class 7	Natural Gas	7.11E-03	5.95E-02	1.64E+00	0.00E+00	1.00E-03	1.20E-02	4.23E-02	5.53E-02	9.21E-04	3.00E-03	1.48E-02	1.87E-02	7.81E+02	4.97E-01	1.59E-01	1,624	0.00%
San Bernardino	2023 T6 Utility Class 5	Diesel	6.20E-03	4.54E-01	3.20E-02	1.00E-02	5.30E-03	1.20E-02	4.23E-02	5.96E-02	5.07E-03	3.00E-03	1.48E-02	2.29E-02	1.06E+03	2.88E-04	1.66E-01	8,088	0.01%
San Bernardino	2023 T6 Utility Class 5	Natural Gas	6.26E-03	1.14E-01	2.10E+00	0.00E+00	6.57E-04	1.20E-02	4.24E-02	5.50E-02	6.04E-04	3.00E-03	1.48E-02	1.84E-02	7.92E+02	4.38E-01	1.62E-01	40	0.00%
San Bernardino	2023 T6 Utility Class 6	Diesel	5.49E-03	4.62E-01	3.19E-02	9.95E-03	5.07E-03	1.20E-02	4.23E-02	5.93E-02	4.85E-03	3.00E-03	1.48E-02	2.26E-02	1.05E+03	2.55E-04	1.66E-01	1,521	0.00%
San Bernardino	2023 T6 Utility Class 6	Natural Gas	5.91E-03	1.35E-01	2.25E+00	0.00E+00	5.24E-04	1.20E-02	4.24E-02	5.49E-02	4.82E-04	3.00E-03	1.48E-02	1.83E-02	7.90E+02	4.14E-01	1.61E-01	15	0.00%
San Bernardino	2023 T6 Utility Class 7	Diesel	4.44E-03	3.76E-01	2.91E-02	1.00E-02	4.51E-03	1.20E-02	4.23E-02	5.88E-02	4.32E-03	3.00E-03	1.48E-02	2.21E-02	1.06E+03	2.06E-04	1.67E-01	2,113	0.00%
San Bernardino	2023 T6 Utility Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	2	0.00%
San Bernardino	2023 T6 Utility Class 7	Natural Gas	5.91E-03	1.35E-01	2.25E+00	0.00E+00	5.23E-04	1.20E-02	4.24E-02	5.49E-02	4.81E-04	3.00E-03	1.48E-02	1.83E-02	7.88E+02	4.14E-01	1.61E-01	22	0.00%
San Bernardino	2023 T6TS	Gasoline	6.64E-02	5.11E-01	1.69E+00	1.64E-02	9.99E-04	1.20E-02	4.21E-02	5.51E-02	9.18E-04	3.00E-03	1.47E-02	1.87E-02	1.66E+03	1.35E-02	2.50E-02	143,249	0.21%
San Bernardino	2023 T7 CAIRP Class 8	Diesel	1.31E-02	1.56E+00	5.28E-02	1.47E-02	3.48E-02	3.60E-02	7.17E-02	1.43E-01	3.33E-02	9.00E-03	2.51E-02	6.74E-02	1.55E+03	6.09E-04	2.44E-01	1,254,697	1.80%
San Bernardino	2023 T7 CAIRP Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.59E-02	7.19E-02	0.00E+00	9.00E-03	1.26E-02	2.16E-02	0.00E+00	0.00E+00	0.00E+00	1,463	0.00%
San Bernardino	2023 T7 CAIRP Class 8	Natural Gas	1.26E-02	3.05E-01	5.62E+00	0.00E+00	1.53E-03	3.60E-02	7.47E-02	1.12E-01	1.41E-03	9.00E-03	2.61E-02	3.66E-02	1.13E+03	8.83E-01	2.31E-01	1,690	0.00%
San Bernardino	2023 T7 NNOOS Class 8	Diesel	1.23E-02	1.45E+00	4.42E-02	1.46E-02	3.27E-02	3.60E-02	7.17E-02	1.40E-01	3.13E-02	9.00E-03	2.51E-02	6.54E-02	1.54E+03	5.71E-04	2.43E-01	1,487,277	2.13%
San Bernardino	2023 T7 NOOS Class 8	Diesel	1.34E-02	1.58E+00	5.34E-02	1.46E-02	3.55E-02	3.60E-02	7.17E-02	1.43E-01	3.39E-02	9.00E-03	2.51E-02	6.81E-02	1.54E+03	6.22E-04	2.43E-01	540,222	0.77%
San Bernardino	2023 T7 POLA Class 8	Diesel	1.13E-02	1.62E+00	7.57E-02	1.54E-02	2.79E-02	3.60E-02	7.51E-02	1.39E-01	2.66E-02	9.00E-03	2.63E-02	6.19E-02	1.63E+03	5.26E-04	2.57E-01	311,937	0.45%
San Bernardino	2023 T7 POLA Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.75E-02	7.35E-02	0.00E+00	9.00E-03	1.31E-02	2.21E-02	0.00E+00	0.00E+00	0.00E+00	36	0.00%
San Bernardino	2023 T7 POLA Class 8	Natural Gas	1.27E-02	3.81E-01	7.24E+00	0.00E+00	1.36E-03	3.60E-02	7.58E-02	1.13E-01	1.25E-03	9.00E-03	2.65E-02	3.68E-02	1.23E+03	8.86E-01	2.51E-01	3,200	0.00%
San Bernardino	2023 T7 Public Class 8	Diesel	6.89E-02	9.74E+00	2.74E-01	1.58E-02	5.96E-02	3.60E-02	9.09E-02	1.86E-01	5.70E-02	9.00E-03	3.18E-02	9.78E-02	1.67E+03	3.20E-03	2.64E-01	34,988	0.05%
San Bernardino	2023 T7 Public Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.72E-02	7.32E-02	0.00E+00	9.00E-03	1.30E-02	2.20E-02	0.00E+00	0.00E+00	0.00E+00	14	0.00%
San Bernardino	2023 T7 Public Class 8	Natural Gas	1.30E-02	2.75E-01	5.19E+00	0.00E+00	1.64E-03	3.60E-02	7.77E-02	1.15E-01	1.51E-03	9.00E-03	2.72E-02	3.77E-02	1.16E+03	9.07E-01	2.36E-01	10,847	0.02%
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Diesel	8.53E-03	9.01E-01	4.28E-02	1.55E-02	1.68E-02	3.60E-02	7.59E-02	1.29E-01	1.61E-02	9.00E-03	2.66E-02	5.16E-02	1.64E+03	3.96E-04	2.58E-01	30,611	0.04%
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.83E-02	7.43E-02	0.00E+00	9.00E-03	1.34E-02	2.24E-02	0.00E+00	0.00E+00	0.00E+00	13	0.00%
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.31E-02	2.98E-01	5.33E+00	0.00E+00	1.63E-03	3.60E-02	7.64E-02	1.14E-01	1.50E-03	9.00E-03	2.67E-02	3.72E-02	1.16E+03	9.14E-01	2.37E-01	2,514	0.00%
San Bernardino	2023 T7 Single Dump Class 8	Diesel	1.63E-02	1.50E+00	8.07E-02	1.55E-02	2.08E-02	3.60E-02	7.57E-02	1.32E-01	1.99E-02	9.00E-03	2.65E-02	5.54E-02	1.63E+03	7.55E-04	2.57E-01	48,991	0.07%
San Bernardino	2023 T7 Single Dump Class 8	Natural Gas	1.28E-02	3.68E-01	6.96E+00	0.00E+00	1.42E-03	3.60E-02	7.62E-02	1.14E-01	1.31E-03	9.00E-03	2.67E-02	3.70E-02	1.23E+03	8.95E-01	2.50E-01	2,942	0.00%
San Bernardino	2023 T7 Single Other Class 8	Diesel	1.21E-02	1.15E+00	6.05E-02	1.53E-02	1.80E-02	3.60E-02	7.60E-02	1.30E-01	1.72E-02	9.00E-03	2.66E-02	5.28E-02	1.61E+03	5.61E-04	2.54E-01	138,902	0.20%
San Bernardino	2023 T7 Single Other Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.81E-02	7.41E-02	0.00E+00	9.00E-03	1.33E-02	2.23E-02	0.00E+00	0.00E+00	0.00E+00	84	0.00%
San Bernardino	2023 T7 Single Other Class 8	Natural Gas	1.30E-02	2.85E-01	5.45E+00	0.00E+00	1.63E-03	3.60E-02	7.64E-02	1.14E-01	1.50E-03	9.00E-03	2.67E-02	3.72E-02	1.17E+03	9.12E-01	2.39E-01	9,523	0.01%
San Bernardino	2023 T7 SWCV Class 8	Diesel	3.45E-03	1.34E+01	1.13E-02	3.47E-02	1.29E-02	3.60E-02	2.10E-01	2.59E-01	1.24E-02	9.00E-03	7.35E-02	9.49E-02	3.66E+03	1.60E-04	5.77E-01	35,276	0.05%
San Bernardino	2023 T7 SWCV Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	1.05E-01	1.41E-01	0.00E+00	9.00E-03	3.68E-02	4.58E-02	0.00E+00	0.00E+00	0.00E+00	25	0.00%
San Bernardino	2023 T7 SWCV Class 8	Natural Gas	5.93E-02	1.50E+00	1.09E+01	0.00E+00	2.28E-03	3.60E-02	2.10E-01	2.48E-01	2.09E-03	9.00E-03	7.35E-02	8.46E-02	1.16E+03	2.32E+00	2.37E-01	116,640	0.17%
San Bernardino	2023 T7 Tractor Class 8	Diesel	1.46E-02	1.56E+00	6.62E-02	1.47E-02	2.66E-02	3.60E-02	7.40E-02	1.37E-01	2.54E-02	9.00E-03	2.59E-02	6.03E-02	1.55E+03	6.79E-04	2.45E-01	405,659	0.58%
San Bernardino	2023 T7 Tractor Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.70E-02	7.30E-02	0.00E+00	9.00E-03	1.30E-02	2.20E-02	0.00E+00	0.00E+00	0.00E+00	165	0.00%
San Bernardino	2023 T7 Tractor Class 8	Natural Gas	1.27E-02	3.04E-01	5.64E+00	0.00E+00	1.55E-03	3.60E-02	7.51E-02	1.13E-01	1.42E-03	9.00E-03	2.63E-02	3.67E-02	1.18E+03	8.89E-01	2.40E-01	10,353	0.01%
San Bernardino	2023 T7 Utility Class 8	Diesel	9.63E-03	1.01E+00	5.57E-02	1.53E-02	1.38E-02	3.60E-02	7.51E-02	1.25E-01	1.32E-02	9.00E-03	2.63E-02	4.85E-02	1.62E+03	4.47E-04	2.54E-01	6,416	0.01%
San Bernardino	2023 T7 Utility Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.75E-02	7.35E-02	0.00E+00	9.00E-03	1.31E-02	2.21E-02	0.00E+00	0.00E+00	0.00E+00	1	0.00%
San Bernardino	2023 T7IS	Gasoline	2.52E+00	1.09E+01	1.53E+02	2.35E-02	5.07E-03	2.00E-02	9.03E-02	1.15E-01	4.66E-03	5.00E-03	3.16E-02	4.13E-02	2.37E+03	3.93E-01	2.66E-01	422	0.00%
San Bernardino	2023 UBUS																		

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: San Bernardino
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, c

			lbs/Mile																		1.00E-06
Region	Calendar Year	Vehicle Category	Fuel	ROG_RUNEX	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_TOTAL	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX		
San Bernardino	2023	All Other Buses	Diesel	1.23E-01	2.72E-04	5.04E-03	8.10E-04	2.20E-05	2.65E-05	9.44E-05	1.64E-04	2.85E-04	6.61E-06	3.30E-05	1.57E-04	1.96E-04	2.32E+00	1.26E-05	3.66E-04		
San Bernardino	2023	All Other Buses	Natural Gas	7.16E-03	1.58E-05	2.90E-04	5.19E-03	0.00E+00	2.65E-05	9.52E-05	1.65E-06	1.23E-04	6.61E-06	3.33E-05	1.51E-06	4.14E-05	1.90E+00	1.11E-03	3.88E-04		
San Bernardino	2023	LDA	Gasoline	9.97E-03	2.20E-05	1.00E-04	1.77E-03	6.30E-06	1.76E-05	1.48E-05	2.91E-06	3.54E-05	4.41E-06	5.18E-06	2.68E-06	1.23E-05	6.37E-01	5.77E-06	1.09E-05		
San Bernardino	2023	LDA	Diesel	3.02E-02	6.65E-05	5.30E-04	7.60E-04	5.07E-06	1.76E-05	1.46E-05	4.35E-05	7.58E-05	4.41E-06	5.12E-06	4.17E-05	5.12E-05	5.35E-01	3.09E-06	8.42E-05		
San Bernardino	2023	LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.62E-06	0.00E+00	2.73E-05	4.41E-06	3.37E-06	0.00E+00	7.78E-06	0.00E+00	0.00E+00	0.00E+00		
San Bernardino	2023	LDA	Plug-in Hybrid	1.30E-03	2.87E-06	6.71E-06	4.92E-04	3.00E-06	1.76E-05	8.22E-06	1.55E-06	2.74E-05	4.41E-06	2.88E-06	1.42E-06	8.71E-06	3.03E-01	9.29E-07	1.27E-06		
San Bernardino	2023	LDT1	Gasoline	4.66E-02	1.03E-04	4.77E-04	4.80E-03	7.58E-06	1.76E-05	1.78E-05	5.33E-06	4.07E-05	4.41E-06	6.22E-06	4.90E-06	1.55E-05	7.67E-01	2.27E-05	3.19E-05		
San Bernardino	2023	LDT1	Diesel	3.08E-01	6.79E-04	3.69E-03	4.35E-03	8.91E-06	1.76E-05	1.93E-05	5.55E-04	5.91E-04	4.41E-06	6.74E-06	5.31E-04	5.42E-04	9.40E-01	3.15E-05	1.48E-04		
San Bernardino	2023	LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.64E-06	0.00E+00	2.73E-05	4.41E-06	3.38E-06	0.00E+00	7.78E-06	0.00E+00	0.00E+00	0.00E+00		
San Bernardino	2023	LDT1	Plug-in Hybrid	1.18E-03	2.60E-06	6.09E-06	4.48E-04	2.72E-06	1.76E-05	8.31E-06	9.19E-07	2.69E-05	4.41E-06	2.91E-06	8.45E-07	8.16E-06	2.75E-01	8.33E-07	1.13E-06		
San Bernardino	2023	LDT2	Gasoline	1.38E-02	3.04E-05	1.90E-04	2.15E-03	7.78E-06	1.76E-05	1.69E-05	2.98E-06	3.75E-05	4.41E-06	5.92E-06	2.74E-06	1.31E-05	7.87E-01	7.62E-06	1.52E-05		
San Bernardino	2023	LDT2	Diesel	1.42E-02	3.13E-05	1.37E-04	2.74E-04	6.64E-06	1.76E-05	1.62E-05	1.44E-05	4.83E-05	4.41E-06	5.67E-06	1.38E-05	2.39E-05	7.00E-01	1.45E-06	1.10E-04		
San Bernardino	2023	LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.60E-06	0.00E+00	2.72E-05	4.41E-06	3.36E-06	0.00E+00	7.77E-06	0.00E+00	0.00E+00	0.00E+00		
San Bernardino	2023	LDT2	Plug-in Hybrid	1.22E-03	2.70E-06	6.33E-06	4.66E-04	2.83E-06	1.76E-05	8.26E-06	1.17E-06	2.71E-05	4.41E-06	2.89E-06	1.07E-06	8.37E-06	2.86E-01	8.67E-07	1.18E-06		
San Bernardino	2023	LHD1	Gasoline	3.59E-02	7.92E-05	5.07E-04	3.02E-03	1.41E-05	1.76E-05	1.72E-04	2.83E-06	1.92E-04	4.41E-06	6.02E-05	2.60E-06	6.72E-05	1.43E+00	1.58E-05	2.79E-05		
San Bernardino	2023	LHD1	Diesel	1.20E-01	2.64E-04	4.91E-03	9.29E-04	1.03E-05	2.65E-05	1.72E-04	6.81E-05	2.67E-04	6.61E-06	6.02E-05	6.52E-05	1.32E-04	1.09E+00	1.23E-05	1.72E-04		
San Bernardino	2023	LHD2	Gasoline	1.88E-02	4.15E-05	4.00E-04	1.95E-03	1.57E-05	1.76E-05	2.01E-04	2.33E-06	2.21E-04	4.41E-06	7.02E-05	2.14E-06	7.68E-05	1.59E+00	8.93E-06	2.45E-05		
San Bernardino	2023	LHD2	Diesel	1.01E-01	2.23E-04	3.58E-03	6.65E-04	1.24E-05	2.65E-05	2.01E-04	5.96E-05	2.87E-04	6.61E-06	7.02E-05	5.70E-05	1.34E-04	1.31E+00	1.04E-05	2.06E-04		
San Bernardino	2023	MCY	Gasoline	1.21E+00	2.67E-03	1.38E-03	3.21E-02	4.16E-06	8.82E-06	2.65E-05	4.09E-06	3.94E-05	2.20E-06	9.26E-06	3.83E-06	1.53E-05	4.21E-01	3.98E-04	9.26E-05		
San Bernardino	2023	MDV	Gasoline	2.33E-02	5.15E-05	3.21E-04	2.82E-03	9.59E-06	1.76E-05	1.75E-05	3.18E-06	3.84E-05	4.41E-06	6.14E-06	2.92E-06	1.35E-05	9.70E-01	1.20E-05	2.24E-05		
San Bernardino	2023	MDV	Diesel	1.71E-02	3.76E-05	3.81E-04	5.78E-04	9.15E-06	1.76E-05	1.72E-05	2.13E-05	5.61E-05	4.41E-06	6.02E-06	2.03E-05	3.08E-05	9.66E-01	1.75E-06	1.52E-04		
San Bernardino	2023	MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.60E-06	0.00E+00	2.72E-05	4.41E-06	3.36E-06	0.00E+00	7.77E-06	0.00E+00	0.00E+00	0.00E+00		
San Bernardino	2023	MDV	Plug-in Hybrid	1.28E-03	2.82E-06	6.59E-06	4.84E-04	2.94E-06	1.76E-05	8.24E-06	1.57E-06	2.74E-05	4.41E-06	2.88E-06	1.44E-06	8.73E-06	2.98E-01	9.06E-07	1.23E-06		
San Bernardino	2023	MH	Gasoline	5.91E-02	1.30E-04	9.97E-04	4.04E-03	3.87E-05	2.65E-05	9.29E-05	2.87E-06	1.22E-04	6.61E-06	3.25E-05	2.64E-06	4.18E-05	3.92E+00	2.98E-05	5.94E-05		
San Bernardino	2023	MH	Diesel	8.12E-02	1.79E-04	9.85E-03	7.79E-04	2.05E-05	3.53E-05	9.27E-05	3.50E-04	4.78E-04	8.82E-06	3.24E-05	3.35E-04	3.76E-04	2.16E+00	8.31E-06	3.41E-04		
San Bernardino	2023	Motor Coach	Diesel	1.42E-02	3.12E-05	3.66E-03	2.02E-04	3.66E-05	2.65E-05	1.79E-04	5.15E-05	2.57E-04	6.61E-06	6.25E-05	4.93E-05	1.18E-04	3.87E+00	1.45E-06	6.09E-04		
San Bernardino	2023	OBUS	Gasoline	7.11E-02	1.57E-04	1.31E-03	4.00E-03	3.69E-05	2.65E-05	9.35E-05	1.87E-06	1.22E-04	6.61E-06	3.27E-05	1.72E-06	4.11E-05	3.73E+00	3.17E-05	6.04E-05		
San Bernardino	2023	PTO	Diesel	2.29E-02	5.06E-05	6.46E-03	5.62E-04	4.32E-05	0.00E+00	0.00E+00	1.09E-05	1.09E-05	0.00E+00	0.00E+00	1.04E-05	4.56E+00	2.35E-06	7.19E-04			
San Bernardino	2023	PTO	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
San Bernardino	2023	SBUS	Gasoline	7.42E-02	1.64E-04	1.19E-03	3.28E-03	1.96E-05	1.76E-05	1.03E-04	2.69E-06	1.24E-04	4.41E-06	3.61E-05	2.48E-06	4.30E-05	1.98E+00	3.30E-05	6.31E-05		
San Bernardino	2023	SBUS	Diesel	9.57E-02	2.11E-04	1.15E-02	5.40E-04	2.63E-05	2.65E-05	1.03E-04	6.98E-05	1.99E-04	6.61E-06	3.61E-05	6.67E-05	1.10E-04	2.77E+00	9.80E-06	4.37E-04		
San Bernardino	2023	SBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	5.16E-05	0.00E+00	7.81E-05	6.61E-06	1.81E-05	0.00E+00	2.47E-05	0.00E+00	0.00E+00	0.00E+00		
San Bernardino	2023	SBUS	Natural Gas	6.13E-02	1.35E-04	1.53E-03	3.14E-02	0.00E+00	2.65E-05	1.03E-04	9.88E-06	1.40E-04	6.61E-06	3.61E-05	9.09E-06	5.18E-05	3.68E+00	9.45E-03	7.51E-04		
San Bernardino	2023	T6 CAIRP Class 4	Diesel	1.05E-02																	

San Bernardino	2023 T6 OOS Class 6	Diesel	1.06E-02	2.34E-05	9.64E-04	9.02E-05	2.31E-05	2.65E-05	9.22E-05	1.97E-05	1.38E-04	6.61E-06	3.23E-05	1.89E-05	5.77E-05	2.44E+00	1.08E-06	3.84E-04
San Bernardino	2023 T6 OOS Class 7	Diesel	6.14E-03	1.35E-05	9.59E-04	6.98E-05	2.17E-05	2.65E-05	9.22E-05	1.55E-05	1.34E-04	6.61E-06	3.23E-05	1.48E-05	5.37E-05	2.29E+00	6.29E-07	3.61E-04
San Bernardino	2023 T6 Public Class 4	Diesel	3.51E-02	7.74E-05	1.15E-02	2.57E-04	2.27E-05	2.65E-05	9.30E-05	5.82E-05	1.78E-04	6.61E-06	3.25E-05	5.56E-05	9.48E-05	2.39E+00	3.60E-06	3.77E-04
San Bernardino	2023 T6 Public Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.65E-05	0.00E+00	7.29E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 4	Natural Gas	6.78E-03	1.50E-05	1.69E-04	3.88E-03	0.00E+00	2.65E-05	9.33E-05	1.94E-06	1.22E-04	6.61E-06	3.26E-05	1.79E-06	4.10E-05	1.70E+00	1.05E-03	3.47E-04
San Bernardino	2023 T6 Public Class 5	Diesel	1.73E-02	3.82E-05	4.73E-03	1.45E-04	2.29E-05	2.65E-05	9.31E-05	3.01E-05	1.50E-04	6.61E-06	3.26E-05	2.88E-05	6.80E-05	2.42E+00	1.77E-06	3.81E-04
San Bernardino	2023 T6 Public Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.65E-05	0.00E+00	7.30E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 5	Natural Gas	6.29E-03	1.39E-05	2.46E-04	4.51E-03	0.00E+00	2.65E-05	9.33E-05	1.54E-06	1.21E-04	6.61E-06	3.26E-05	1.41E-06	4.07E-05	1.73E+00	9.70E-04	3.53E-04
San Bernardino	2023 T6 Public Class 6	Diesel	4.10E-02	9.03E-05	1.08E-02	2.76E-04	2.28E-05	2.65E-05	9.31E-05	6.71E-05	1.87E-04	6.61E-06	3.26E-05	6.42E-05	1.03E-04	2.41E+00	4.20E-06	3.80E-04
San Bernardino	2023 T6 Public Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.65E-05	0.00E+00	7.30E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 6	Natural Gas	6.73E-03	1.48E-05	1.89E-04	4.08E-03	0.00E+00	2.65E-05	9.33E-05	1.89E-06	1.22E-04	6.61E-06	3.27E-05	1.74E-06	4.10E-05	1.73E+00	1.04E-03	3.53E-04
San Bernardino	2023 T6 Public Class 7	Diesel	4.48E-02	9.89E-05	1.10E-02	2.93E-04	2.30E-05	2.65E-05	9.31E-05	7.65E-05	1.96E-04	6.61E-06	3.26E-05	7.31E-05	1.12E-04	2.43E+00	4.59E-06	3.82E-04
San Bernardino	2023 T6 Public Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.65E-05	0.00E+00	7.30E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 7	Natural Gas	7.11E-03	1.57E-05	1.31E-04	3.62E-03	0.00E+00	2.65E-05	9.33E-05	2.21E-06	1.22E-04	6.61E-06	3.26E-05	2.03E-06	4.13E-05	1.72E+00	1.10E-03	3.51E-04
San Bernardino	2023 T6 Utility Class 5	Diesel	6.20E-03	1.37E-05	1.00E-03	7.06E-05	2.20E-05	2.65E-05	9.32E-05	1.17E-05	1.31E-04	6.61E-06	3.26E-05	1.12E-05	5.04E-05	2.33E+00	6.35E-07	3.67E-04
San Bernardino	2023 T6 Utility Class 5	Natural Gas	6.26E-03	1.38E-05	2.52E-04	4.64E-03	0.00E+00	2.65E-05	9.34E-05	1.45E-06	1.21E-04	6.61E-06	3.27E-05	1.33E-06	4.06E-05	1.75E+00	9.66E-04	3.56E-04
San Bernardino	2023 T6 Utility Class 6	Diesel	5.49E-03	1.21E-05	1.02E-03	7.03E-05	2.19E-05	2.65E-05	9.32E-05	1.12E-05	1.31E-04	6.61E-06	3.26E-05	1.07E-05	4.99E-05	2.32E+00	5.62E-07	3.65E-04
San Bernardino	2023 T6 Utility Class 6	Natural Gas	5.91E-03	1.30E-05	2.97E-04	4.96E-03	0.00E+00	2.65E-05	9.34E-05	1.16E-06	1.21E-04	6.61E-06	3.27E-05	1.06E-06	4.04E-05	1.74E+00	9.12E-04	3.55E-04
San Bernardino	2023 T6 Utility Class 7	Diesel	4.44E-03	9.79E-06	8.29E-04	6.41E-05	2.21E-05	2.65E-05	9.32E-05	9.95E-06	1.30E-04	6.61E-06	3.26E-05	9.51E-06	4.87E-05	2.33E+00	4.55E-07	3.67E-04
San Bernardino	2023 T6 Utility Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.30E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Utility Class 7	Natural Gas	5.91E-03	1.30E-05	2.97E-04	4.97E-03	0.00E+00	2.65E-05	9.34E-05	1.15E-06	1.21E-04	6.61E-06	3.27E-05	1.06E-06	4.04E-05	1.74E+00	9.12E-04	3.54E-04
San Bernardino	2023 T6TS	Gasoline	6.64E-02	1.46E-04	1.13E-03	3.72E-03	3.61E-05	2.65E-05	9.29E-05	2.20E-06	1.22E-04	6.61E-06	3.25E-05	2.02E-06	4.12E-05	3.65E+00	2.98E-05	5.50E-05
San Bernardino	2023 T7 CAIRP Class 8	Diesel	1.31E-02	2.89E-05	3.43E-03	1.17E-04	3.23E-05	7.94E-05	1.58E-04	7.68E-05	3.14E-04	1.98E-05	5.53E-05	7.35E-05	1.49E-04	3.41E+00	1.34E-06	5.38E-04
San Bernardino	2023 T7 CAIRP Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	7.91E-05	0.00E+00	1.58E-04	1.98E-05	2.77E-05	0.00E+00	4.75E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 CAIRP Class 8	Natural Gas	1.26E-02	2.78E-05	6.73E-04	1.24E-02	0.00E+00	7.94E-05	1.65E-04	3.37E-06	2.47E-04	1.98E-05	5.76E-05	3.10E-06	8.06E-05	2.50E+00	1.95E-03	5.09E-04
San Bernardino	2023 T7 NNOOS Class 8	Diesel	1.23E-02	2.71E-05	3.21E-03	9.74E-05	3.22E-05	7.94E-05	1.58E-04	7.20E-05	3.10E-04	1.98E-05	5.53E-05	6.89E-05	1.44E-04	3.40E+00	1.26E-06	5.36E-04
San Bernardino	2023 T7 NOOS Class 8	Diesel	1.34E-02	2.95E-05	3.49E-03	1.18E-04	3.22E-05	7.94E-05	1.58E-04	7.82E-05	3.16E-04	1.98E-05	5.53E-05	7.48E-05	1.50E-04	3.40E+00	1.37E-06	5.36E-04
San Bernardino	2023 T7 POLA Class 8	Diesel	1.13E-02	2.50E-05	3.56E-03	1.67E-04	3.40E-05	7.94E-05	1.66E-04	6.14E-05	3.06E-04	1.98E-05	5.79E-05	5.88E-05	1.37E-04	3.59E+00	1.16E-06	5.66E-04
San Bernardino	2023 T7 POLA Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.28E-05	0.00E+00	1.62E-04	1.98E-05	2.90E-05	0.00E+00	4.88E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 POLA Class 8	Natural Gas	1.27E-02	2.79E-05	8.40E-04	1.60E-02	0.00E+00	7.94E-05	1.67E-04	3.00E-06	2.49E-04	1.98E-05	5.85E-05	2.76E-06	8.11E-05	2.71E+00	1.95E-03	5.53E-04
San Bernardino	2023 T7 Public Class 8	Diesel	6.89E-02	1.52E-04	2.15E-02	6.05E-04	3.49E-05	7.94E-05	2.00E-04	1.31E-04	4.11E-04	1.98E-05	7.01E-05	1.26E-04	2.16E-04	3.69E+00	7.06E-06	5.81E-04
San Bernardino	2023 T7 Public Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.21E-05	0.00E+00	1.61E-04	1.98E-05	2.87E-05	0.00E+00	4.86E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Public Class 8	Natural Gas	1.30E-02	2.86E-05	6.06E-04	1.14E-02	0.00E+00	7.94E-05	1.71E-04	3.61E-06	2.54E-04	1.98E-05	5.99E-05	3.32E-06	8.31E-05	2.55E+00	2.00E-03	5.20E-04
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Diesel	8.53E-03	1.88E-05	1.99E-03	9.44E-05	3.42E-05	7.94E-05	1.67E-04	3.70E-05	2.84E-04	1.98E-05	5.85E-05	3.54E-05	1.14E-04	3.61E+00	8.74E-07	5.69E-04
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.44E-05	0.00E+00	1.64E-04	1.98E-05	2.96E-05	0.00E+00	4.94E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.31E-02	2.88E-05	6.56E-04	1.17E-02	0.00E+00	7.94E-05	1.68E-04	3.60E-06	2.51E-04	1.98E-05	5.90E-05	3.31E-06	8.21E-05	2.56E+00	2.02E-03	5.21E-04
San Bernardino	2023 T7 Single Dump Class 8	Diesel	1.63E-02	3.58E-05	3.30E-03	1.78E-04	3.41E-05	7.94E-05	1.67E-04	4.59E-05	2.92E-04	1.98E-05	5.84E-05	4.39E-05	1.22E-04	3.60E+00	1.66E-06	5.67E-04
San Bernardino	2023 T7 Single Dump Class 8	Natural Gas	1.28E-02	2.82E-05	8.12E-04	1.53E-02	0.00E+00	7.94E-05	1.68E-04	3.13E-06	2.51E-04	1.98E-05	5.88E-05	2.88E-06	8.15E-05	2.70E+00	1.97E-03	5.51E-04
San Bernardino	2023 T7 Single Other Class 8	Diesel	1.21E-02	2.66E-05	2.54E-03	1.33E-04	3.37E-05	7.94E-05	1.68E-04	3.96E-05	2.87E-04	1.98E-05	5.87E-05	3.79E-05	1.16E-04	3.56E+00	1.24E-06	5.61E-04
San Bernardino	2023 T7 Single Other Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.40E-05	0.00E+00	1.63E-04	1.98E-05	2.94E-05	0.00E+00	4.93E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Single Other Class 8	Natural Gas	1.30E-02	2.87E-05	6.28E-04	1.20E-02	0.00E+00	7.94E-05	1.68E-04	3.58E-06	2.51E-04	1.98E-05	5.89E-05	3.30E-06	8.21E-05	2.59E+00	2.01E-03	5.28E-04
San Bernardino	2023 T7 SWCV Class 8	Diesel	3.45E-03	7.61E-06	2.95E-02	2.49E-05	7.64E-05	7.94E-05	4.63E-04	2.85E-05	5.71E-04	1.98E-05	1.62E-04	2.73E-05	2.09E-04	8.07E+00	3.53E-07	1.27E-03
San Bernardino	2023 T7 SWCV Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	2.31E-04	0.00E+00	3.11E-04	1.98E-05	8.10E-05	0.00E+00	1.01E-04	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 SWCV Class 8	Natural Gas	5.93E-02	1.31E-04	3.30E-03	2.41E-02	0.00E+00	7.94E-05	4.63E-04	5.02E-06	5.47E-04	1.98E-05	1.62E-04	4.62E-06	1.86E-04	2.56E+00	5.11E-03	5.23E-04
San Bernardino	2023 T7 Tractor Class 8	Diesel	1.46E-02	3.22E-05	3.45E-03	1.46E-04	3.24E-05	7.94E-05	1.63E-04	5.86E-05	3.01E-04	1.98E-05	5.71E-05	5.61E-05	1.33E-04	3.42E+00	1.50E-06	5.40E-04
San Bernardino	2023 T7 Tractor Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.16E-05	0.00E+00	1.61E-04	1.98E-05	2.86E-05	0.00E+00	4.84E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Tractor Class 8	Natural Gas	1.27E-02	2.80E-05	6.69E-04	1.24E-02	0.00E+00	7.94E-05	1.66E-04	3.41E-06	2.48E-04	1.98E-05	5.79E-05	3.14E-06	8.09E-05	2.59E+00	1.96E-03	5.29E-04
San Bernardino	2023 T7 Utility Class 8	Diesel	9.63E-03	2.12E-05	2.23E-03	1.23E-04	3.37E-05	7.94E-05	1.66E-04	3.04E-05	2.75E-04	1.98E-05	5.79E-05	2.91E-05	1.07E-04	3.56E+00	9.86E-07	5.61E-04
San Bernardino	2023 T7 Utility Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.28E-05	0.00E+00	1.62E-04	1.98E-05	2.90E-05	0.00E+00	4.88E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7IS	Gasoline	2.52E+00	5.56E-03	2.41E-02	3.37E-01	5.17E-05	4.41E-05	1.99E-04	1.12E-05	2.54E-04	1.10E-05	6.97E-05	1.03E-05	9.10E-05	5.23E+00	8.67E-04	5.87E-04
San Bernardino	2023 UBUS	Gasoline	1.21E-02	2.66E-05	3.36E-04	9.49E-04	3.24E-05	2.22E-05	2.22E-04	3.32E-06	2.48E-04	5.55E-06	7.78E-05	3.05E-06	8.64E-05	3.28E+00	8.17E-06	3.15E-05
San Bernardino	2023 UBUS	Diesel	5.16E-02	1.14E-04	6.7													

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: San Bernardino
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, c

MTens/Mile																			
Region	Calendar Year	Vehicle Category	Fuel	ROG_RUNEX	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
San Bernardino	2023	All Other Buses	Diesel	1.23E-01	1.23E-07	2.29E-06	3.67E-07	9.99E-09	1.20E-08	4.28E-08	7.43E-08	1.29E-07	3.00E-09	1.50E-08	7.11E-08	8.91E-08	1.05E-03	5.72E-09	1.66E-07
San Bernardino	2023	All Other Buses	Natural Gas	7.16E-03	7.16E-09	1.31E-07	2.35E-06	0.00E+00	1.20E-08	4.32E-08	7.47E-10	5.59E-08	3.00E-09	1.51E-08	6.87E-10	1.88E-08	8.64E-04	5.01E-07	1.76E-07
San Bernardino	2023	LDA	Gasoline	9.97E-03	9.97E-09	4.56E-08	8.04E-07	2.86E-09	8.00E-09	6.71E-09	1.32E-09	1.60E-08	2.00E-09	2.35E-09	1.22E-09	5.57E-09	2.89E-04	2.62E-09	4.97E-09
San Bernardino	2023	LDA	Diesel	3.02E-02	3.02E-08	2.41E-07	3.45E-07	2.30E-09	8.00E-09	6.63E-09	1.98E-08	3.44E-08	2.00E-09	2.32E-09	1.89E-08	2.32E-08	2.43E-04	1.40E-09	3.82E-08
San Bernardino	2023	LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.36E-09	0.00E+00	1.24E-08	2.00E-09	1.53E-09	0.00E+00	3.53E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	LDA	Plug-in Hybrid	1.30E-03	1.30E-09	3.04E-09	2.23E-07	1.36E-09	8.00E-09	3.73E-09	7.02E-10	1.24E-08	2.00E-09	1.30E-09	6.46E-10	3.95E-09	1.37E-04	4.21E-10	5.77E-10
San Bernardino	2023	LDT1	Gasoline	4.66E-02	4.66E-08	2.16E-07	2.18E-06	3.44E-09	8.00E-09	8.06E-09	2.42E-09	1.85E-08	2.00E-09	2.82E-09	2.22E-09	7.05E-09	3.48E-04	1.03E-08	1.44E-08
San Bernardino	2023	LDT1	Diesel	3.08E-01	3.08E-07	1.67E-06	1.98E-06	4.04E-09	8.00E-09	8.74E-09	2.52E-07	2.68E-07	2.00E-09	3.06E-09	2.41E-07	2.46E-07	4.26E-04	1.43E-08	6.72E-08
San Bernardino	2023	LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.37E-09	0.00E+00	1.24E-08	2.00E-09	1.53E-09	0.00E+00	3.53E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	LDT1	Plug-in Hybrid	1.18E-03	1.18E-09	2.76E-09	2.03E-07	1.23E-09	8.00E-09	3.77E-09	4.17E-10	1.22E-08	2.00E-09	1.32E-09	3.83E-10	3.70E-09	1.25E-04	3.78E-10	5.15E-10
San Bernardino	2023	LDT2	Gasoline	1.38E-02	1.38E-08	8.60E-08	9.76E-07	3.53E-09	8.00E-09	7.67E-09	1.35E-09	1.70E-08	2.00E-09	2.69E-09	1.24E-09	5.93E-09	3.57E-04	3.46E-09	6.91E-09
San Bernardino	2023	LDT2	Diesel	1.42E-02	1.42E-08	6.21E-08	1.24E-07	3.01E-09	8.00E-09	7.35E-09	6.55E-09	2.19E-08	2.00E-09	2.57E-09	6.26E-09	1.08E-08	3.18E-04	6.59E-10	5.00E-08
San Bernardino	2023	LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.36E-09	0.00E+00	1.24E-08	2.00E-09	1.52E-09	0.00E+00	3.52E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	LDT2	Plug-in Hybrid	1.22E-03	1.22E-09	2.87E-09	2.11E-07	1.28E-09	8.00E-09	3.75E-09	5.29E-10	1.23E-08	2.00E-09	1.31E-09	4.86E-10	3.80E-09	1.30E-04	3.93E-10	5.36E-10
San Bernardino	2023	LHD1	Gasoline	3.59E-02	3.59E-08	2.30E-07	1.37E-06	6.41E-09	8.00E-09	7.80E-08	1.29E-09	8.73E-08	2.00E-09	2.73E-08	1.18E-09	3.05E-08	6.48E-04	7.15E-09	1.26E-08
San Bernardino	2023	LHD1	Diesel	1.20E-01	1.20E-07	2.23E-06	4.22E-07	4.68E-09	1.20E-08	7.80E-08	3.09E-08	1.21E-07	3.00E-09	2.73E-08	2.96E-08	5.99E-08	4.94E-04	5.56E-09	7.78E-08
San Bernardino	2023	LHD2	Gasoline	1.88E-02	1.88E-08	1.82E-07	8.86E-07	7.14E-09	8.00E-09	9.10E-08	1.05E-09	1.00E-07	2.00E-09	3.19E-08	9.70E-10	3.48E-08	7.22E-04	4.05E-09	1.11E-08
San Bernardino	2023	LHD2	Diesel	1.01E-01	1.01E-07	1.62E-06	3.02E-07	5.62E-09	1.20E-08	9.10E-08	2.70E-08	1.30E-07	3.00E-09	3.19E-08	2.59E-08	6.07E-08	5.93E-04	4.70E-09	9.34E-08
San Bernardino	2023	MCY	Gasoline	1.21E+00	1.21E-06	6.28E-07	1.46E-05	1.89E-09	4.00E-09	1.20E-08	1.86E-09	1.79E-08	1.00E-09	4.20E-09	1.74E-09	6.94E-09	1.91E-04	1.80E-07	4.20E-08
San Bernardino	2023	MDV	Gasoline	2.33E-02	2.33E-08	1.46E-07	1.28E-06	4.35E-09	8.00E-09	7.96E-09	1.44E-09	1.74E-08	2.00E-09	2.78E-09	1.33E-09	6.11E-09	4.40E-04	5.44E-09	1.02E-08
San Bernardino	2023	MDV	Diesel	1.71E-02	1.71E-08	1.73E-07	2.62E-07	4.15E-09	8.00E-09	7.80E-09	9.65E-09	2.54E-08	2.00E-09	2.73E-09	9.23E-09	1.40E-08	4.38E-04	7.93E-10	6.90E-08
San Bernardino	2023	MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.35E-09	0.00E+00	1.24E-08	2.00E-09	1.52E-09	0.00E+00	3.52E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	MDV	Plug-in Hybrid	1.28E-03	1.28E-09	2.99E-09	2.19E-07	1.33E-09	8.00E-09	3.74E-09	7.11E-10	1.24E-08	2.00E-09	1.31E-09	6.54E-10	3.96E-09	1.35E-04	4.11E-10	5.60E-10
San Bernardino	2023	MH	Gasoline	5.91E-02	5.91E-08	4.52E-07	1.83E-06	1.76E-08	1.20E-08	4.21E-08	1.30E-09	5.54E-08	3.00E-09	1.47E-08	1.20E-09	1.89E-08	1.78E-03	1.35E-08	2.70E-08
San Bernardino	2023	MH	Diesel	8.12E-02	8.12E-08	4.47E-06	3.54E-07	9.30E-09	1.60E-08	4.21E-08	1.59E-07	2.17E-07	4.00E-09	1.47E-08	1.52E-07	1.71E-07	9.81E-04	3.77E-09	1.55E-07
San Bernardino	2023	Motor Coach	Diesel	1.42E-02	1.42E-08	1.66E-06	9.18E-08	1.66E-08	1.20E-08	8.11E-08	2.34E-08	1.16E-07	3.00E-09	2.84E-08	2.24E-08	5.37E-08	1.75E-03	6.58E-10	2.76E-07
San Bernardino	2023	OBUS	Gasoline	7.11E-02	7.11E-08	5.96E-07	1.82E-06	1.67E-08	1.20E-08	4.24E-08	8.50E-10	5.53E-08	3.00E-09	1.48E-08	7.82E-10	1.86E-08	1.69E-03	1.44E-08	2.74E-08
San Bernardino	2023	PTO	Diesel	2.29E-02	2.29E-08	2.93E-06	2.55E-07	1.96E-08	0.00E+00	0.00E+00	4.93E-09	4.93E-09	0.00E+00	0.00E+00	4.71E-09	2.07E-03	1.07E-09	3.26E-07	
San Bernardino	2023	PTO	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	SBUS	Gasoline	7.42E-02	7.42E-08	5.39E-07	1.49E-06	8.89E-09	8.00E-09	4.68E-08	1.22E-09	5.61E-08	2.00E-09	1.64E-08	1.12E-09	1.95E-08	9.00E-04	1.50E-08	2.86E-08
San Bernardino	2023	SBUS	Diesel	9.57E-02	9.57E-08	5.23E-06	2.45E-07	1.19E-08	1.20E-08	4.68E-08	3.16E-08	9.05E-08	3.00E-09	1.64E-08	3.03E-08	4.97E-08	1.26E-03	4.44E-09	1.98E-07
San Bernardino	2023	SBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.34E-08	0.00E+00	3.54E-08	3.00E-09	8.20E-09	0.00E+00	1.12E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	SBUS	Natural Gas	6.13E-02	6.13E-08	6.95E-07	1.42E-05	0.00E+00	1.20E-08	4.68E-08	4.48E-09	6.33E-08	3.00E-09	1.64E-08	4.12E-09	2.35E-08	1.67E-03	4.29E-06	3.41E-07
San Bernardino	2023	T6 CAIRP Class 4	Diesel	1.05E-02	1.05E-08	4.53E-07	4.09E-08	1.07E-08	1.20E-08	4.18E-08	9.00E-09	6.28E-08	3.00E-09	1.46E-08	8.61E-09	2.62E-08	1.13E-03	4.87E-10	1.77E-07
San Bernardino	2023	T6 CAIRP Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.09E-08	0.00E+00	3.29E-08	3.00E-09	7.32E-09	0.00E+00	1.03E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	T6 CAIRP Class 5	Diesel	6.95E-03	6.95E-09	4.01E-07	3.18E-08	1.06E-08	1.20E-08	4.18E-08	7.03E-09	6.09E-08	3.00E-09	1.46E-08	6.72E-09	2.44E-08	1.12E-03	3.23E-10	1.77E-07
San Bernardino	2023	T6 CAIRP Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.09E-08	0.00E+00	3.29E-08	3.00E-09	7.32E-09	0.00E+00	1.03E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	T6 CAIRP Class 6	Diesel	8.62E-03	8.62E-09	3.87E-07	3.57E-08	1.05E-08	1.20E-08	4.18E-08	7.81E-09	6.16E-08	3.00E-09	1.46E-08	7.48E-09	2.51E-08	1.11E-03	4.00E-10	1.74E-07
San Bernardino	2023	T6 CAIRP Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.09E-08	0.00E+00	3.29E-08	3.00E-09	7.32E-09	0.00E+00	1.03E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	T6 CAIRP Class 7	Diesel	6.22E-03	6.22E-09	4.32E-07	3.17E-08	9.90E-09	1.20E-08	4.18E-08	7.07E-09	6.09E-08	3.00E-09	1.46E-08	6.77E-09	2.44E-08	1.05E-03	2.89E-10	1.65E-07
San Bernardino	2023	T6 CAIRP Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.09E-08	0.00E+00	3.29E-08	3.00E-09	7.32E-09	0.00E+00	1.03E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	T6 CAIRP Class 7	Natural Gas	5.92E-03	5.92E-09	1.24E-07	2.15E-06	0.00E+00	1.20E-08	4.23E-08	5.68E-10	5.49E-08	3.00E-09	1.48E-08	5.22E-10	1.83E-08	7.70E-04	4.14E-07	1.57E-07
San Bernardino	2023	T6 Instate Delivery Class 4	Diesel	3.44E-02	3.44E-08	1.13E-06	1.23E-07	1.03E-08	1.20E-08	4.25E-08	2.09E-08	7.54E-08	3.00E-09	1.49E-08	2.00E-08	3.79E-08	1.08E-03	1.60E-09	1.71E-07
San Bernardino	2023	T6 Instate Delivery Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.44E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	T6 Instate Delivery Class 4	Natural Gas	6.72E-03	6.72E-09	1.09E-07	2.13E-06	0.00E+00	1.20E-08	4.26E-08	7.51E-10	5.53E-08	3.00E-09	1.49E-08	6.91E-10	1.86E-08	8.15E-04	4.70E-07	1.66E-07
San Bernardino	2023	T6 Instate Delivery Class 5	Diesel	1.27E-02	1.27E-08	5.28E-07	5.82E-08	1.04E-08	1.20E-08	4.25E-08	9.05E-09	6.36E-08	3.00E-09	1.49E-08	8.66E-09	2.65E-08	1.10E-03	5.90E-10	1.74E-07
San Bernardino	2023	T6 Instate Delivery Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.13E-08	0.00E+00	3.33E-08	3.00E-09	7.44E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023	T6 Instate Delivery Class 5	Natural Gas	6.78E-03	6.78E-09	1.05E-07	2.11E-06	0.00E+00	1.20E-08	4.26E-08	7.76E-10	5.53E-08	3.00E-09	1.49E-08	7.13E-10	1.86E-08	8.04E-04	4.75E-07	1.64E-07
San Bernardino	2023	T6 Instate Delivery Class 6	Diesel	1.64E-02	1.64E-08	6.98E-07	6.93E-08	1.03E-08	1.20E-08	4.25E-08	1.11E-08	6.56E-08	3.00E-09	1.49E-08	1.06E-08	2.85E-08	1.09E-03	7.60E	

San Bernardino	2023 T6 OOS Class 6	Diesel	1.06E-02	1.06E-08	4.37E-07	4.09E-08	1.05E-08	1.20E-08	4.18E-08	8.94E-09	6.28E-08	3.00E-09	1.46E-08	8.55E-09	2.62E-08	1.11E-03	4.92E-10	1.74E-07
San Bernardino	2023 T6 OOS Class 7	Diesel	6.14E-03	6.14E-09	4.35E-07	3.17E-08	9.85E-09	1.20E-08	4.18E-08	7.04E-09	6.09E-08	3.00E-09	1.46E-08	6.73E-09	2.44E-08	1.04E-03	2.85E-10	1.64E-07
San Bernardino	2023 T6 Public Class 4	Diesel	3.51E-02	3.51E-08	5.21E-06	1.17E-07	1.03E-08	1.20E-08	4.22E-08	2.64E-08	8.06E-08	3.00E-09	1.48E-08	2.52E-08	4.30E-08	1.09E-03	1.63E-09	1.71E-07
San Bernardino	2023 T6 Public Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.37E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 4	Natural Gas	6.78E-03	6.78E-09	7.66E-08	1.76E-06	0.00E+00	1.20E-08	4.23E-08	8.81E-10	5.52E-08	3.00E-09	1.48E-08	8.10E-10	1.86E-08	7.71E-04	4.75E-07	1.57E-07
San Bernardino	2023 T6 Public Class 5	Diesel	1.73E-02	1.73E-08	2.15E-06	6.59E-08	1.04E-08	1.20E-08	4.22E-08	1.37E-08	6.79E-08	3.00E-09	1.48E-08	1.31E-08	3.08E-08	1.10E-03	8.05E-10	1.73E-07
San Bernardino	2023 T6 Public Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.38E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 5	Natural Gas	6.29E-03	6.29E-09	1.12E-07	2.04E-06	0.00E+00	1.20E-08	4.23E-08	6.98E-10	5.50E-08	3.00E-09	1.48E-08	6.41E-10	1.84E-08	7.86E-04	4.40E-07	1.60E-07
San Bernardino	2023 T6 Public Class 6	Diesel	4.10E-02	4.10E-08	4.90E-06	1.25E-07	1.04E-08	1.20E-08	4.22E-08	3.04E-08	8.47E-08	3.00E-09	1.48E-08	2.91E-08	4.69E-08	1.09E-03	1.90E-09	1.72E-07
San Bernardino	2023 T6 Public Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.39E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 6	Natural Gas	6.73E-03	6.73E-09	8.57E-08	1.85E-06	0.00E+00	1.20E-08	4.23E-08	8.57E-10	5.52E-08	3.00E-09	1.48E-08	7.88E-10	1.86E-08	7.85E-04	4.71E-07	1.60E-07
San Bernardino	2023 T6 Public Class 7	Diesel	4.48E-02	4.48E-08	5.01E-06	1.33E-07	1.04E-08	1.20E-08	4.22E-08	3.47E-08	8.89E-08	3.00E-09	1.48E-08	3.32E-08	5.10E-08	1.10E-03	2.08E-09	1.73E-07
San Bernardino	2023 T6 Public Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.39E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Public Class 7	Natural Gas	7.11E-03	7.11E-09	5.95E-08	1.64E-06	0.00E+00	1.20E-08	4.23E-08	1.00E-09	5.53E-08	3.00E-09	1.48E-08	9.21E-10	1.87E-08	7.81E-04	4.97E-07	1.59E-07
San Bernardino	2023 T6 Utility Class 5	Diesel	6.20E-03	6.20E-09	4.54E-07	3.20E-08	1.00E-08	1.20E-08	4.23E-08	5.30E-09	5.96E-08	3.00E-09	1.48E-08	5.07E-09	2.29E-08	1.06E-03	2.88E-10	1.66E-07
San Bernardino	2023 T6 Utility Class 5	Natural Gas	6.26E-03	6.26E-09	1.14E-07	2.10E-06	0.00E+00	1.20E-08	4.24E-08	6.57E-10	5.50E-08	3.00E-09	1.48E-08	6.04E-10	1.84E-08	7.92E-04	4.38E-07	1.62E-07
San Bernardino	2023 T6 Utility Class 6	Diesel	5.49E-03	5.49E-09	4.62E-07	3.19E-08	9.95E-09	1.20E-08	4.23E-08	5.07E-09	5.93E-08	3.00E-09	1.48E-08	4.85E-09	2.26E-08	1.05E-03	2.55E-10	1.66E-07
San Bernardino	2023 T6 Utility Class 6	Natural Gas	5.91E-03	5.91E-09	1.35E-07	2.25E-06	0.00E+00	1.20E-08	4.24E-08	5.24E-10	5.49E-08	3.00E-09	1.48E-08	4.82E-10	1.83E-08	7.90E-04	4.14E-07	1.61E-07
San Bernardino	2023 T6 Utility Class 7	Diesel	4.44E-03	4.44E-09	3.76E-07	2.91E-08	1.00E-08	1.20E-08	4.23E-08	4.51E-09	5.88E-08	3.00E-09	1.48E-08	4.32E-09	2.21E-08	1.06E-03	2.06E-10	1.67E-07
San Bernardino	2023 T6 Utility Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T6 Utility Class 7	Natural Gas	5.91E-03	5.91E-09	1.35E-07	2.25E-06	0.00E+00	1.20E-08	4.24E-08	5.23E-10	5.49E-08	3.00E-09	1.48E-08	4.81E-10	1.83E-08	7.88E-04	4.14E-07	1.61E-07
San Bernardino	2023 T6TS	Gasoline	6.64E-02	6.64E-08	5.11E-07	1.69E-06	1.64E-08	1.20E-08	4.21E-08	9.99E-10	5.51E-08	3.00E-09	1.47E-08	9.18E-10	1.87E-08	1.66E-03	1.35E-08	2.50E-08
San Bernardino	2023 T7 CAIRP Class 8	Diesel	1.31E-02	1.31E-08	1.56E-06	5.28E-08	1.47E-08	3.60E-08	7.17E-08	3.48E-08	1.43E-07	9.00E-09	2.51E-08	3.33E-08	6.74E-08	1.55E-03	6.09E-10	2.44E-07
San Bernardino	2023 T7 CAIRP Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.59E-08	0.00E+00	7.19E-08	9.00E-09	1.26E-08	0.00E+00	2.16E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 CAIRP Class 8	Natural Gas	1.26E-02	1.26E-08	3.05E-07	5.62E-06	0.00E+00	3.60E-08	7.47E-08	1.53E-09	1.12E-07	9.00E-09	2.61E-08	1.41E-08	3.66E-08	1.13E-03	8.83E-07	2.31E-07
San Bernardino	2023 T7 NNOOS Class 8	Diesel	1.23E-02	1.23E-08	1.45E-06	4.42E-08	1.46E-08	3.60E-08	7.17E-08	3.27E-08	1.40E-07	9.00E-09	2.51E-08	3.13E-08	6.54E-08	1.54E-03	5.71E-10	2.43E-07
San Bernardino	2023 T7 NOOS Class 8	Diesel	1.34E-02	1.34E-08	1.58E-06	5.34E-08	1.46E-08	3.60E-08	7.17E-08	3.55E-08	1.43E-07	9.00E-09	2.51E-08	3.39E-08	6.81E-08	1.54E-03	6.22E-10	2.43E-07
San Bernardino	2023 T7 POLA Class 8	Diesel	1.13E-02	1.13E-08	1.62E-06	7.57E-08	1.54E-08	3.60E-08	7.51E-08	2.79E-08	1.39E-07	9.00E-09	2.63E-08	2.66E-08	6.19E-08	1.63E-03	5.26E-10	2.57E-07
San Bernardino	2023 T7 POLA Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.75E-08	0.00E+00	7.35E-08	9.00E-09	1.31E-08	0.00E+00	2.21E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 POLA Class 8	Natural Gas	1.27E-02	1.27E-08	3.81E-07	7.24E-06	0.00E+00	3.60E-08	7.58E-08	1.36E-09	1.13E-07	9.00E-09	2.65E-08	1.25E-09	3.68E-08	1.23E-03	8.86E-07	2.51E-07
San Bernardino	2023 T7 Public Class 8	Diesel	6.89E-02	6.89E-08	9.74E-06	2.74E-07	1.58E-08	3.60E-08	9.09E-08	5.96E-08	1.86E-07	9.00E-09	3.18E-08	5.70E-08	9.78E-08	1.67E-03	3.20E-09	2.64E-07
San Bernardino	2023 T7 Public Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.72E-08	0.00E+00	7.32E-08	9.00E-09	1.30E-08	0.00E+00	2.20E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Public Class 8	Natural Gas	1.30E-02	1.30E-08	2.75E-07	5.19E-06	0.00E+00	3.60E-08	7.77E-08	1.64E-09	1.15E-07	9.00E-09	2.72E-08	1.51E-09	3.77E-08	1.16E-03	9.07E-07	2.36E-07
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Diesel	8.53E-03	8.53E-09	9.01E-07	4.28E-08	1.55E-08	3.60E-08	7.59E-08	1.68E-08	1.29E-07	9.00E-09	2.66E-08	1.61E-08	5.16E-08	1.64E-03	3.96E-10	2.58E-07
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.83E-08	0.00E+00	7.43E-08	9.00E-09	1.34E-08	0.00E+00	2.24E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.31E-02	1.31E-08	2.98E-07	5.33E-06	0.00E+00	3.60E-08	7.64E-08	1.63E-09	1.14E-07	9.00E-09	2.67E-08	1.50E-09	3.72E-08	1.16E-03	9.14E-07	2.37E-07
San Bernardino	2023 T7 Single Dump Class 8	Diesel	1.63E-02	1.63E-08	1.50E-06	8.07E-08	1.55E-08	3.60E-08	7.57E-08	2.08E-08	1.32E-07	9.00E-09	2.65E-08	1.99E-08	5.54E-08	1.63E-03	7.55E-10	2.57E-07
San Bernardino	2023 T7 Single Dump Class 8	Natural Gas	1.28E-02	1.28E-08	3.68E-07	6.96E-06	0.00E+00	3.60E-08	7.62E-08	1.42E-09	1.14E-07	9.00E-09	2.67E-08	1.31E-09	3.70E-08	1.23E-03	8.95E-07	2.50E-07
San Bernardino	2023 T7 Single Other Class 8	Diesel	1.21E-02	1.21E-08	1.15E-06	6.05E-08	1.53E-08	3.60E-08	7.60E-08	1.80E-08	1.30E-07	9.00E-09	2.66E-08	1.72E-08	5.28E-08	1.61E-03	5.61E-10	2.54E-07
San Bernardino	2023 T7 Single Other Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.81E-08	0.00E+00	7.41E-08	9.00E-09	1.33E-08	0.00E+00	2.23E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Single Other Class 8	Natural Gas	1.30E-02	1.30E-08	2.85E-07	5.45E-06	0.00E+00	3.60E-08	7.64E-08	1.63E-09	1.14E-07	9.00E-09	2.67E-08	1.50E-09	3.72E-08	1.17E-03	9.12E-07	2.39E-07
San Bernardino	2023 T7 SWCV Class 8	Diesel	3.45E-03	3.45E-09	1.34E-05	1.13E-08	3.47E-08	3.60E-08	2.10E-07	1.29E-08	2.59E-07	9.00E-09	7.35E-08	1.24E-08	9.49E-08	3.66E-03	1.60E-10	5.77E-07
San Bernardino	2023 T7 SWCV Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	1.05E-07	0.00E+00	1.41E-07	9.00E-09	3.68E-08	0.00E+00	4.58E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 SWCV Class 8	Natural Gas	5.93E-02	5.93E-08	1.50E-06	1.09E-05	0.00E+00	3.60E-08	2.10E-07	2.28E-09	2.48E-07	9.00E-09	7.35E-08	2.09E-09	8.46E-08	1.16E-03	2.32E-06	2.37E-07
San Bernardino	2023 T7 Tractor Class 8	Diesel	1.46E-02	1.46E-08	1.56E-06	6.62E-08	1.47E-08	3.60E-08	7.40E-08	2.66E-08	1.37E-07	9.00E-09	2.59E-08	2.54E-08	6.03E-08	1.55E-03	6.79E-10	2.45E-07
San Bernardino	2023 T7 Tractor Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.70E-08	0.00E+00	7.30E-08	9.00E-09	1.30E-08	0.00E+00	2.20E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7 Tractor Class 8	Natural Gas	1.27E-02	1.27E-08	3.04E-07	5.64E-06	0.00E+00	3.60E-08	7.51E-08	1.55E-09	1.13E-07	9.00E-09	2.63E-08	1.42E-09	3.67E-08	1.18E-03	8.89E-07	2.40E-07
San Bernardino	2023 T7 Utility Class 8	Diesel	9.63E-03	9.63E-09	1.01E-06	5.57E-08	1.53E-08	3.60E-08	7.51E-08	1.38E-08	1.25E-07	9.00E-09	2.63E-08	1.32E-08	4.85E-08	1.62E-03	4.47E-10	2.54E-07
San Bernardino	2023 T7 Utility Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.75E-08	0.00E+00	7.35E-08	9.00E-09	1.31E-08	0.00E+00	2.21E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2023 T7IS	Gasoline	2.52E+00	2.52E-06	1.09E-05	1.53E-04	2.35E-08	2.00E-08	9.03E-08	5.07E-09	1.15E-07	5.00E-09	3.16E-08	4.66E-09	4.13E-08	2.37E-03	3.93E-07	2.66E-07
San Bernardino	2023 UBUS	Gasoline	1.21E-02	1.21E-08	1.52E-07	4.30E-07	1.47E-08	1.01E-08	1.01E-07	1.50E-09	1.12E-07	2.52E-09	3.53E-08	1.38E-09	3.92E-08	1.49E-03	3.71E-09	1.43E-08
San Bernardino	2023 UBUS	Diesel	5.16E-02	5.16E-08	3.0													

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: San Bernardino
Calendar Year: 2048
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for RUNEX, PMB&W and PMTW, g/trip for STREX, HOTSOAK and RUNLOSS, g/vehicle/day for IDLEX and DIURN. PHEV calculated based on total VMT.

			g/mile																			
Region	Calendar Year	Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	X	PM2.5_RUNE	PM2.5_PMT	PM2.5_PMB	PM2.5_TOTA	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX	VMT Total	% of VMT	
San Bernardino	2048	All Other Buses	Diesel	1.32E-02	6.73E-01	7.01E-02	9.02E-03	9.04E-03	1.20E-02	4.33E-02	6.43E-02	8.65E-03	3.00E-03	1.51E-02	2.68E-02	9.53E+02	6.15E-04	1.50E-01			12,965	0.02%
San Bernardino	2048	All Other Buses	Natural Gas	8.62E-03	6.94E-02	2.27E+00	0.00E+00	1.22E-03	1.20E-02	4.38E-02	5.70E-02	1.13E-03	3.00E-03	1.53E-02	1.94E-02	7.67E+02	6.03E-01	1.56E-01			2,889	0.00%
San Bernardino	2048	LDA	Gasoline	2.78E-03	1.90E-02	4.83E-01	2.25E-03	4.77E-04	8.00E-03	6.76E-03	1.52E-02	4.38E-04	2.00E-03	2.37E-03	4.80E-03	2.27E+02	9.77E-04	3.18E-03			33,207,587	39.09%
San Bernardino	2048	LDA	Diesel	3.72E-03	1.14E-02	1.16E-01	1.74E-03	9.21E-04	8.00E-03	6.76E-03	1.57E-02	8.81E-04	2.00E-03	2.37E-03	5.25E-03	1.83E+02	1.73E-04	2.89E-02			19,424	0.02%
San Bernardino	2048	LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.39E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00			4,302,341	5.06%
San Bernardino	2048	LDA	Plug-in Hybrid	1.05E-03	2.46E-03	1.80E-01	1.09E-03	1.95E-04	8.00E-03	3.89E-03	1.21E-02	1.79E-04	2.00E-03	1.36E-03	3.54E-03	1.11E+02	3.26E-04	4.26E-04			1,562,459	1.84%
San Bernardino	2048	LDT1	Gasoline	3.04E-03	2.05E-02	5.16E-01	2.59E-03	5.14E-04	8.00E-03	7.97E-03	1.65E-02	4.73E-04	2.00E-03	2.79E-03	5.26E-03	2.62E+02	1.04E-03	3.29E-03			2,074,674	2.44%
San Bernardino	2048	LDT1	Diesel	1.09E-02	2.57E-02	1.17E-01	3.23E-03	4.02E-03	8.00E-03	7.92E-03	1.99E-02	3.84E-03	2.00E-03	2.77E-03	8.61E-03	3.41E+02	5.07E-04	5.38E-02			25	0.00%
San Bernardino	2048	LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.40E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00			65,812	0.08%
San Bernardino	2048	LDT1	Plug-in Hybrid	1.05E-03	2.45E-03	1.79E-01	1.09E-03	1.92E-04	8.00E-03	3.89E-03	1.21E-02	1.76E-04	2.00E-03	1.36E-03	3.54E-03	1.10E+02	3.22E-04	4.18E-04			50,842	0.06%
San Bernardino	2048	LDT2	Gasoline	3.87E-03	2.15E-02	5.67E-01	2.68E-03	4.88E-04	8.00E-03	7.87E-03	1.64E-02	4.49E-04	2.00E-03	2.76E-03	5.20E-03	2.71E+02	1.29E-03	3.37E-03			17,517,230	20.62%
San Bernardino	2048	LDT2	Diesel	1.09E-02	2.61E-02	1.14E-01	2.39E-03	3.97E-03	8.00E-03	7.87E-03	1.98E-02	3.79E-03	2.00E-03	2.75E-03	8.55E-03	2.53E+02	5.05E-04	3.98E-02			66,939	0.08%
San Bernardino	2048	LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.40E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00			496,091	0.58%
San Bernardino	2048	LDT2	Plug-in Hybrid	1.05E-03	2.45E-03	1.80E-01	1.09E-03	1.93E-04	8.00E-03	3.89E-03	1.21E-02	1.78E-04	2.00E-03	1.36E-03	3.54E-03	1.11E+02	3.22E-04	4.18E-04			485,061	0.57%
San Bernardino	2048	LHD1	Gasoline	1.55E-03	1.81E-02	6.33E-01	4.79E-03	1.14E-03	8.00E-03	7.80E-02	8.71E-02	1.05E-03	2.00E-03	2.73E-02	3.04E-02	4.85E+02	4.77E-04	1.77E-03			640,185	0.75%
San Bernardino	2048	LHD1	Diesel	3.60E-02	1.86E-01	6.83E-02	4.36E-03	1.10E-02	1.20E-02	7.80E-02	1.01E-01	1.06E-02	3.00E-03	2.73E-02	4.09E-02	4.60E+02	1.67E-03	7.25E-02			435,121	0.51%
San Bernardino	2048	LHD1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	3.90E-02	4.70E-02	0.00E+00	2.00E-03	1.37E-02	1.57E-02	0.00E+00	0.00E+00	0.00E+00			976,101	1.15%
San Bernardino	2048	LHD2	Gasoline	1.41E-03	2.40E-02	6.43E-01	5.40E-03	1.14E-03	8.00E-03	9.10E-02	1.00E-01	1.05E-03	2.00E-03	3.19E-02	3.49E-02	5.46E+02	4.40E-04	2.51E-03			76,917	0.09%
San Bernardino	2048	LHD2	Diesel	4.87E-02	3.00E-01	9.38E-02	5.10E-03	1.51E-02	1.20E-02	9.10E-02	1.18E-01	1.45E-02	3.00E-03	3.19E-02	4.93E-02	5.39E+02	2.26E-03	8.49E-02			209,865	0.25%
San Bernardino	2048	LHD2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.55E-02	5.35E-02	0.00E+00	2.00E-03	1.59E-02	1.79E-02	0.00E+00	0.00E+00	0.00E+00			239,231	0.28%
San Bernardino	2048	MCY	Gasoline	7.50E-01	4.55E-01	9.17E+00	1.81E-03	2.10E-03	4.00E-03	1.20E-02	1.81E-02	1.95E-03	1.00E-03	4.20E-03	7.15E-03	1.83E+02	1.27E-01	3.47E-02			220,476	0.26%
San Bernardino	2048	MDV	Gasoline	4.05E-03	2.25E-02	5.89E-01	3.25E-03	4.94E-04	8.00E-03	8.02E-03	1.65E-02	4.55E-04	2.00E-03	2.81E-03	5.26E-03	3.29E+02	1.35E-03	3.47E-03			10,436,022	12.29%
San Bernardino	2048	MDV	Diesel	4.23E-03	1.70E-02	1.29E-01	3.14E-03	1.12E-03	8.00E-03	8.03E-03	1.71E-02	1.07E-03	2.00E-03	2.81E-03	5.88E-03	3.32E+02	1.96E-04	5.23E-02			113,858	0.13%
San Bernardino	2048	MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-03	4.40E-03	1.24E-02	0.00E+00	2.00E-03	1.54E-03	3.54E-03	0.00E+00	0.00E+00	0.00E+00			459,815	0.54%
San Bernardino	2048	MDV	Plug-in Hybrid	1.05E-03	2.46E-03	1.80E-01	1.09E-03	1.96E-04	8.00E-03	3.90E-03	1.21E-02	1.80E-04	2.00E-03	1.36E-03	3.54E-03	1.11E+02	3.23E-04	4.18E-04			314,745	0.37%
San Bernardino	2048	MH	Gasoline	7.44E-03	2.10E-01	1.37E-01	1.75E-02	1.04E-03	1.20E-02	4.22E-02	5.52E-02	9.58E-04	3.00E-03	1.48E-02	1.87E-02	1.77E+03	2.73E-03	1.83E-02			27,852	0.03%
San Bernardino	2048	MH	Diesel	2.92E-02	1.73E+00	9.63E-02	9.39E-03	2.58E-02	1.60E-02	4.21E-02	8.39E-02	2.47E-02	4.00E-03	1.47E-02	4.34E-02	9.91E+02	1.36E-03	1.56E-01			15,905	0.02%
San Bernardino	2048	Motor Coach	Diesel	9.54E-03	9.20E-01	5.41E-02	1.42E-02	1.68E-02	1.20E-02	9.10E-02	1.20E-01	1.61E-02	3.00E-03	3.19E-02	5.09E-02	1.50E+03	4.43E-04	2.36E-01			9,341	0.01%
San Bernardino	2048	OBUS	Gasoline	6.74E-03	2.42E-01	1.54E-01	1.42E-02	1.01E-03	1.20E-02	4.27E-02	5.57E-02	9.25E-04	3.00E-03	1.49E-02	1.89E-02	1.44E+03	1.91E-03	1.52E-02			10,732	0.01%
San Bernardino	2048	OBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.13E-02	3.33E-02	0.00E+00	3.00E-03	7.47E-03	1.05E-02	0.00E+00	0.00E+00	0.00E+00			13,762	0.02%
San Bernardino	2048	PTO	Diesel	1.39E-02	2.41E+00	1.72E-01	1.63E-02	3.83E-03	0.00E+00	0.00E+00	3.83E-03	3.67E-03	0.00E+00	0.00E+00	3.67E-03	1.72E+03	6.44E-04	2.71E-01			38,881	0.05%
San Bernardino	2048	PTO	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00			42,713	0.05%
San Bernardino	2048	SBUS	Gasoline	1.11E-02	1.28E-01	2.05E-01	7.89E-03	1.67E-03	8.00E-03	4.68E-02	5.65E-02	1.54E-03	2.00E-03	1.64E-02	1.99E-02	7.98E+02	2.62E-03	1.18E-02			11,402	0.01%
San Bernardino	2048	SBUS	Diesel	9.92E-03	4.15E-01	6.61E-02	1.07E-02	3.44E-03	1.20E-02	4.68E-02	6.23E-02	3.29E-03	3.00E-03	1.64E-02	2.27E-02	1.13E+03	4.61E-04	1.78E-01			10,089	0.01%
San Bernardino	2048																					

San Bernardino	2048 T6 Public Class 4	Diesel	5.54E-03	2.67E-01	3.02E-02	9.44E-03	5.04E-03	1.20E-02	4.22E-02	5.93E-02	4.82E-03	3.00E-03	1.48E-02	2.26E-02	9.97E+02	2.57E-04	1.57E-01	2,334	0.00%
San Bernardino	2048 T6 Public Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.39E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	2,720	0.00%
San Bernardino	2048 T6 Public Class 4	Natural Gas	7.31E-03	4.57E-02	1.52E+00	0.00E+00	1.08E-03	1.20E-02	4.23E-02	5.54E-02	9.97E-04	3.00E-03	1.48E-02	1.88E-02	7.47E+02	5.12E-01	1.52E-01	364	0.00%
San Bernardino	2048 T6 Public Class 5	Diesel	5.29E-03	2.58E-01	2.98E-02	9.48E-03	4.85E-03	1.20E-02	4.23E-02	5.91E-02	4.64E-03	3.00E-03	1.48E-02	2.24E-02	1.00E+03	2.46E-04	1.58E-01	4,600	0.01%
San Bernardino	2048 T6 Public Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	5,372	0.01%
San Bernardino	2048 T6 Public Class 5	Natural Gas	7.23E-03	5.41E-02	1.61E+00	0.00E+00	1.04E-03	1.20E-02	4.24E-02	5.54E-02	9.61E-04	3.00E-03	1.48E-02	1.88E-02	7.53E+02	5.06E-01	1.54E-01	799	0.00%
San Bernardino	2048 T6 Public Class 6	Diesel	5.14E-03	2.26E-01	2.91E-02	9.45E-03	4.63E-03	1.20E-02	4.23E-02	5.89E-02	4.43E-03	3.00E-03	1.48E-02	2.22E-02	9.98E+02	2.39E-04	1.57E-01	3,443	0.00%
San Bernardino	2048 T6 Public Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	3,988	0.00%
San Bernardino	2048 T6 Public Class 6	Natural Gas	7.33E-03	4.77E-02	1.56E+00	0.00E+00	1.08E-03	1.20E-02	4.24E-02	5.54E-02	9.96E-04	3.00E-03	1.48E-02	1.88E-02	7.51E+02	5.13E-01	1.53E-01	578	0.00%
San Bernardino	2048 T6 Public Class 7	Diesel	4.75E-03	2.11E-01	2.80E-02	9.32E-03	4.46E-03	1.20E-02	4.23E-02	5.87E-02	4.27E-03	3.00E-03	1.48E-02	2.21E-02	9.84E+02	2.20E-04	1.55E-01	10,610	0.01%
San Bernardino	2048 T6 Public Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	9,609	0.01%
San Bernardino	2048 T6 Public Class 7	Natural Gas	7.37E-03	4.50E-02	1.54E+00	0.00E+00	1.10E-03	1.20E-02	4.24E-02	5.55E-02	1.01E-03	3.00E-03	1.48E-02	1.88E-02	7.50E+02	5.16E-01	1.53E-01	1,772	0.00%
San Bernardino	2048 T6 Utility Class 5	Diesel	3.76E-03	1.28E-01	2.36E-02	9.27E-03	3.76E-03	1.20E-02	4.23E-02	5.81E-02	3.59E-03	3.00E-03	1.48E-02	2.14E-02	9.79E+02	1.75E-04	1.54E-01	3,670	0.00%
San Bernardino	2048 T6 Utility Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.12E-02	3.32E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	5,596	0.01%
San Bernardino	2048 T6 Utility Class 5	Natural Gas	7.50E-03	4.40E-02	1.59E+00	0.00E+00	1.12E-03	1.20E-02	4.24E-02	5.56E-02	1.03E-03	3.00E-03	1.49E-02	1.89E-02	7.53E+02	5.25E-01	1.53E-01	18	0.00%
San Bernardino	2048 T6 Utility Class 6	Diesel	3.76E-03	1.25E-01	2.36E-02	9.27E-03	3.73E-03	1.20E-02	4.23E-02	5.80E-02	3.57E-03	3.00E-03	1.48E-02	2.14E-02	9.79E+02	1.75E-04	1.54E-01	694	0.00%
San Bernardino	2048 T6 Utility Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.12E-02	3.32E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	1,057	0.00%
San Bernardino	2048 T6 Utility Class 6	Natural Gas	7.50E-03	4.40E-02	1.59E+00	0.00E+00	1.12E-03	1.20E-02	4.24E-02	5.56E-02	1.03E-03	3.00E-03	1.49E-02	1.89E-02	7.53E+02	5.25E-01	1.53E-01	3	0.00%
San Bernardino	2048 T6 Utility Class 7	Diesel	3.72E-03	1.22E-01	2.33E-02	9.28E-03	3.71E-03	1.20E-02	4.23E-02	5.80E-02	3.55E-03	3.00E-03	1.48E-02	2.14E-02	9.80E+02	1.73E-04	1.54E-01	954	0.00%
San Bernardino	2048 T6 Utility Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.12E-02	3.32E-02	0.00E+00	3.00E-03	7.40E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	1,482	0.00%
San Bernardino	2048 T6 Utility Class 7	Natural Gas	7.50E-03	4.40E-02	1.59E+00	0.00E+00	1.12E-03	1.20E-02	4.24E-02	5.56E-02	1.03E-03	3.00E-03	1.49E-02	1.89E-02	7.53E+02	5.25E-01	1.53E-01	5	0.00%
San Bernardino	2048 T6TS	Gasoline	7.83E-03	6.10E-02	1.49E-01	1.38E-02	1.06E-03	1.20E-02	4.21E-02	5.52E-02	9.70E-04	3.00E-03	1.47E-02	1.87E-02	1.40E+03	2.21E-03	6.57E-03	68,018	0.08%
San Bernardino	2048 T6TS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-02	2.11E-02	3.31E-02	0.00E+00	3.00E-03	7.37E-03	1.04E-02	0.00E+00	0.00E+00	0.00E+00	87,211	0.10%
San Bernardino	2048 T7 CAIRP Class 8	Diesel	1.10E-02	1.12E+00	3.00E-02	1.20E-02	3.06E-02	3.60E-02	7.94E-02	1.46E-01	2.93E-02	9.00E-03	2.78E-02	6.61E-02	1.27E+03	5.11E-04	2.00E-01	2,062,522	2.43%
San Bernardino	2048 T7 CAIRP Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	3.97E-02	7.57E-02	0.00E+00	9.00E-03	1.39E-02	2.29E-02	0.00E+00	0.00E+00	0.00E+00	603,973	0.71%
San Bernardino	2048 T7 CAIRP Class 8	Natural Gas	1.29E-02	1.51E-01	2.77E+00	0.00E+00	1.87E-03	3.60E-02	8.20E-02	1.20E-01	1.72E-03	9.00E-03	2.87E-02	3.94E-02	1.01E+03	9.00E-01	2.06E-01	2,380	0.00%
San Bernardino	2048 T7 NNOOS Class 8	Diesel	1.07E-02	1.23E+00	2.92E-02	1.15E-02	3.02E-02	3.60E-02	7.94E-02	1.46E-01	2.89E-02	9.00E-03	2.78E-02	6.57E-02	1.21E+03	4.97E-04	1.91E-01	3,155,669	3.71%
San Bernardino	2048 T7 NOOS Class 8	Diesel	1.10E-02	1.27E+00	3.01E-02	1.15E-02	3.20E-02	3.60E-02	7.94E-02	1.47E-01	3.06E-02	9.00E-03	2.78E-02	6.74E-02	1.21E+03	5.13E-04	1.91E-01	1,146,229	1.35%
San Bernardino	2048 T7 POLA Class 8	Diesel	1.00E-02	1.11E+00	3.45E-02	1.28E-02	2.56E-02	3.60E-02	8.21E-02	1.44E-01	2.45E-02	9.00E-03	2.87E-02	6.22E-02	1.35E+03	4.67E-04	2.13E-01	406,639	0.48%
San Bernardino	2048 T7 POLA Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.12E-02	7.72E-02	0.00E+00	9.00E-03	1.44E-02	2.34E-02	0.00E+00	0.00E+00	0.00E+00	78,937	0.09%
San Bernardino	2048 T7 POLA Class 8	Natural Gas	1.29E-02	1.51E-01	2.83E+00	0.00E+00	1.88E-03	3.60E-02	8.22E-02	1.20E-01	1.72E-03	9.00E-03	2.88E-02	3.95E-02	1.01E+03	9.05E-01	2.06E-01	16,630	0.02%
San Bernardino	2048 T7 Public Class 8	Diesel	1.56E-02	1.41E+00	5.69E-02	1.42E-02	1.97E-02	3.60E-02	8.11E-02	1.37E-01	1.88E-02	9.00E-03	2.84E-02	5.62E-02	1.50E+03	7.25E-04	2.36E-01	13,748	0.02%
San Bernardino	2048 T7 Public Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.12E-02	7.72E-02	0.00E+00	9.00E-03	1.44E-02	2.34E-02	0.00E+00	0.00E+00	0.00E+00	22,755	0.03%
San Bernardino	2048 T7 Public Class 8	Natural Gas	1.30E-02	1.67E-01	3.21E+00	0.00E+00	1.86E-03	3.60E-02	8.18E-02	1.20E-01	1.71E-03	9.00E-03	2.86E-02	3.93E-02	1.06E+03	9.12E-01	2.16E-01	15,867	0.02%
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Diesel	7.92E-03	6.77E-01	2.83E-02	1.35E-02	1.51E-02	3.60E-02	8.31E-02	1.34E-01	1.44E-02	9.00E-03	2.91E-02	5.25E-02	1.42E+03	3.68E-04	2.24E-01	14,651	0.02%
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.16E-02	7.76E-02	0.00E+00	9.00E-03	1.46E-02	2.36E-02	0.00E+00	0.00E+00	0.00E+00	21,629	0.03%
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.31E-02	1.52E-01	3.00E+00	0.00E+00	1.91E-03	3.60E-02	8.35E-02	1.21E-01	1.75E-03	9.00E-03	2.92E-02	4.00E-02	1.05E+03	9.20E-01	2.14E-01	1,046	0.00%
San Bernardino	2048 T7 Single Dump Class 8	Diesel	9.46E-03	9.10E-01	3.59E-02	1.37E-02	1.93E-02	3.60E-02	8.18E-02	1.37E-01	1.84E-02	9.00E-03	2.86E-02	5.60E-02	1.45E+03	4.39E-04	2.28E-01	27,776	0.03%
San Bernardino	2048 T7 Single Dump Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.15E-02	7.75E-02	0.00E+00	9.00E-03	1.45E-02	2.35E-02	0.00E+00	0.00E+00	0.00E+00	28,814	0.03%
San Bernardino	2048 T7 Single Dump Class 8	Natural Gas	1.31E-02	1.70E-01	3.31E+00	0.00E+00	1.86E-03	3.60E-02	8.24E-02	1.20E-01	1.71E-03	9.00E-03	2.88E-02	3.95E-02	1.06E+03	9.16E-01	2.17E-01	1,907	0.00%
San Bernardino	2048 T7 Single Other Class 8	Diesel	8.65E-03	8.16E-01	3.20E-02	1.36E-02	1.77E-02	3.60E-02	8.24E-02	1.36E-01	1.69E-02	9.00E-03	2.88E-02	5.48E-02	1.44E+03	4.02E-04	2.26E-01	140,240	0.17%
San Bernardino	2048 T7 Single Other Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.16E-02	7.76E-02	0.00E+00	9.00E-03	1.46E-02	2.36E-02	0.00E+00	0.00E+00	0.00E+00	164,669	0.19%
San Bernardino	2048 T7 Single Other Class 8	Natural Gas	1.31E-02	1.58E-01	3.11E+00	0.00E+00	1.89E-03	3.60E-02	8.28E-02	1.21E-01	1.74E-03	9.00E-03	2.90E-02	3.97E-02	1.06E+03	9.19E-01	2.15E-01	10,194	0.01%
San Bernardino	2048 T7 SWCV Class 8	Diesel	1.54E-02	3.01E+00	1.68E-02	3.04E-02	3.16E-02	3.60E-02	2.10E-01	2.78E-01	3.02E-02	9.00E-03	7.35E-02	1.13E-01	3.21E+03	7.16E-04	5.05E-01	2,480	0.00%
San Bernardino	2048 T7 SWCV Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	1.05E-01	1.41E-01	0.00E+00	9.00E-03	3.68E-02	4.58E-02	0.00E+00	0.00E+00	0.00E+00	76,517	0.09%
San Bernardino	2048 T7 SWCV Class 8	Natural Gas	6.57E-03	2.00E-01	5.92E+00	0.00E+00	7.13E-04	3.60E-02	2.10E-01	2.47E-01	6.56E-04	9.00E-03	7.35E-02	8.32E-02	9.21E+02	3.94E-01	1.88E-01	94,553	0.11%
San Bernardino	2048 T7 Tractor Class 8	Diesel	1.00E-02	1.08E+00	3.13E-02	1.20E-02	2.53E-02	3.60E-02	8.10E-02	1.42E-01	2.42E-02	9.00E-03	2.84E-02	6.16E-02	1.27E+03	4.66E-04	1.99E-01	714,005	0.84%
San Bernardino	2048 T7 Tractor Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-02	4.07E-02	7.67E-02	0.00E+00	9.00E-03	1.42E-02	2.32E-02	0.00E+00	0.00E+00	0.00E+00	153,719	0.18%
San Bernardino	2048 T7 Tractor Class 8	Natural Gas	1.29E-02	1.53E-01	2.86E+00	0.00E+00	1.87E-03	3.60E-02	8.19E-02	1.20E-01	1.72E-03	9.00E-03	2.87E-02	3.94E-02	1.02E+03	9.04E-01	2.07E-01	15,309	0.02%
San Bernardino	2048 T7 Utility Class 8	Diesel	8.52E-03	7.39E-01	3.42E-02	1.39E-02	1.50E-02	3.60E-02	8.04E-02	1.31E-01	1.43E-02	9.00E-03	2.82E-02	5.15E-02	1.47E+03	3.96E-04	2.32E-		

Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for I

.00E-06

Region	Calendar Year	Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_RUNEX	PM10_PMTW	PM10_PMBW	PM10_TOTAL	PM2.5_RUNEX	PM2.5_PMTW	PM2.5_PMBW	PM2.5_TOTAL	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
San Bernardino		2048 All Other Buses	Diesel	1.32E-02	6.73E-01	2.92E-05	1.48E-03	1.54E-04	1.99E-05	2.65E-05	9.54E-05	1.99E-05	1.42E-04	6.61E-06	3.34E-05	1.91E-05	5.91E-05	2.10E+00	1.36E-06	3.31E-04
San Bernardino		2048 All Other Buses	Natural Gas	8.62E-03	6.94E-02	1.90E-05	1.53E-04	5.01E-03	0.00E+00	2.65E-05	9.65E-05	2.70E-06	1.26E-04	6.61E-06	3.38E-05	2.48E-06	4.29E-05	1.69E+00	1.33E-03	3.45E-04
San Bernardino		2048 LDA	Gasoline	2.78E-03	1.90E-02	6.13E-06	4.20E-05	1.06E-03	4.95E-06	1.76E-05	1.49E-05	1.05E-06	3.36E-05	4.41E-06	5.22E-06	9.66E-07	1.05E-05	5.01E-01	2.15E-06	7.02E-06
San Bernardino		2048 LDA	Diesel	3.72E-03	1.14E-02	8.20E-06	2.52E-05	2.56E-04	3.83E-06	1.76E-05	1.49E-05	2.03E-06	3.46E-05	4.41E-06	5.22E-06	1.94E-06	1.16E-05	4.04E-01	3.81E-07	6.37E-05
San Bernardino		2048 LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.68E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 LDA	Plug-in Hybrid	1.05E-03	2.46E-03	2.32E-06	5.42E-06	3.96E-04	2.41E-06	1.76E-05	8.58E-06	4.30E-07	2.66E-05	4.41E-06	3.30E-06	3.95E-07	7.81E-06	2.44E-01	7.18E-07	9.40E-07
San Bernardino		2048 LDT1	Gasoline	3.04E-03	2.05E-02	6.70E-06	4.51E-05	1.14E-03	5.71E-06	1.76E-05	1.76E-05	1.13E-06	3.63E-05	4.41E-06	6.15E-06	1.04E-06	1.16E-05	5.77E-01	2.30E-06	7.25E-06
San Bernardino		2048 LDT1	Diesel	1.09E-02	2.57E-02	2.41E-05	5.68E-05	2.57E-04	7.13E-06	1.76E-05	1.75E-05	8.85E-06	4.39E-05	4.41E-06	6.11E-06	8.47E-06	1.90E-05	5.73E-01	1.12E-06	1.19E-04
San Bernardino		2048 LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.69E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 LDT1	Plug-in Hybrid	1.05E-03	2.45E-03	2.32E-06	5.40E-06	3.95E-04	2.41E-06	1.76E-05	8.58E-06	4.22E-07	2.66E-05	4.41E-06	3.30E-06	3.88E-07	7.80E-06	2.43E-01	7.09E-07	9.21E-07
San Bernardino		2048 LDT2	Gasoline	3.87E-03	2.15E-02	8.53E-06	4.74E-05	1.25E-03	5.92E-06	1.76E-05	1.74E-05	1.08E-06	3.61E-05	4.41E-06	6.08E-06	9.89E-07	1.15E-05	5.98E-01	2.85E-06	7.43E-06
San Bernardino		2048 LDT2	Diesel	1.09E-02	2.61E-02	2.40E-05	5.76E-05	2.52E-04	5.28E-06	1.76E-05	1.73E-05	8.74E-06	4.37E-05	4.41E-06	6.07E-06	8.36E-06	1.88E-05	5.57E-01	1.11E-06	8.78E-05
San Bernardino		2048 LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.69E-06	0.00E+00	2.73E-05	4.41E-06	3.39E-06	0.00E+00	7.80E-06	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 LDT2	Plug-in Hybrid	1.05E-03	2.45E-03	2.32E-06	5.41E-06	3.96E-04	2.41E-06	1.76E-05	8.58E-06	4.26E-07	2.66E-05	4.41E-06	3.30E-06	3.92E-07	7.80E-06	2.44E-01	7.10E-07	9.20E-07
San Bernardino		2048 LHD1	Gasoline	1.55E-03	1.81E-02	3.43E-06	3.99E-05	1.40E-03	1.06E-05	1.76E-05	1.72E-04	2.52E-06	1.92E-04	4.41E-06	6.02E-05	2.32E-06	6.69E-05	1.07E+00	1.05E-06	3.91E-06
San Bernardino		2048 LHD1	Diesel	3.60E-02	1.86E-01	7.94E-05	4.10E-04	1.51E-04	9.61E-06	2.65E-05	1.72E-04	2.43E-05	2.23E-04	6.61E-06	6.02E-05	2.33E-05	9.01E-05	1.01E+00	3.69E-06	1.60E-04
San Bernardino		2048 LHD1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	8.60E-05	0.00E+00	1.04E-04	4.41E-06	3.01E-05	0.00E+00	3.45E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 LHD2	Gasoline	1.41E-03	2.40E-02	3.11E-06	5.28E-05	1.42E-03	1.19E-05	1.76E-05	2.01E-04	2.52E-06	2.21E-04	4.41E-06	7.02E-05	2.32E-06	7.69E-05	1.20E+00	9.69E-07	5.53E-06
San Bernardino		2048 LHD2	Diesel	4.87E-02	3.00E-01	1.07E-04	6.62E-04	2.07E-04	1.13E-05	2.65E-05	2.01E-04	3.33E-05	2.60E-04	6.61E-06	7.02E-05	3.19E-05	1.09E-04	1.19E+00	4.99E-06	1.87E-04
San Bernardino		2048 LHD2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	1.00E-04	0.00E+00	1.18E-04	4.41E-06	3.51E-05	0.00E+00	3.95E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 MCV	Gasoline	7.50E-01	4.55E-01	1.65E-03	1.00E-03	2.02E-02	4.00E-06	8.82E-06	2.65E-05	4.62E-06	3.99E-05	2.20E-06	9.26E-06	4.31E-06	1.58E-05	4.04E-01	2.81E-04	7.64E-05
San Bernardino		2048 MDV	Gasoline	4.05E-03	2.25E-02	8.93E-06	4.97E-05	1.30E-03	7.17E-06	1.76E-05	1.77E-05	1.09E-06	3.64E-05	4.41E-06	6.19E-06	1.00E-06	1.16E-05	7.25E-01	2.97E-06	7.66E-06
San Bernardino		2048 MDV	Diesel	4.23E-03	1.70E-02	9.33E-06	3.74E-05	2.85E-04	6.93E-06	1.76E-05	1.77E-05	2.46E-06	3.78E-05	4.41E-06	6.20E-06	2.36E-06	1.30E-05	7.31E-01	4.33E-07	1.15E-04
San Bernardino		2048 MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.76E-05	9.70E-06	0.00E+00	2.73E-05	4.41E-06	3.40E-06	0.00E+00	7.81E-06	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 MDV	Plug-in Hybrid	1.05E-03	2.46E-03	2.32E-06	5.42E-06	3.96E-04	2.41E-06	1.76E-05	8.59E-06	4.32E-07	2.67E-05	4.41E-06	3.01E-06	3.97E-07	7.81E-06	2.44E-01	7.11E-07	9.21E-07
San Bernardino		2048 MH	Gasoline	7.44E-03	2.10E-01	1.64E-05	4.62E-04	3.02E-04	3.86E-05	2.65E-05	9.30E-05	2.30E-06	1.22E-04	6.61E-06	3.26E-05	2.11E-06	4.13E-05	3.91E+00	6.02E-06	4.04E-05
San Bernardino		2048 MH	Diesel	2.92E-02	1.73E+00	6.45E-05	3.81E-03	2.12E-04	2.07E-05	3.53E-05	9.29E-05	5.69E-05	1.85E-04	8.82E-06	3.25E-05	5.44E-05	9.57E-05	2.18E+00	2.99E-06	3.44E-04
San Bernardino		2048 Motor Coach	Diesel	9.54E-03	9.20E-01	2.10E-05	2.03E-03	1.19E-04	3.13E-05	2.65E-05	2.01E-04	3.71E-05	2.64E-04	6.61E-06	7.02E-05	3.55E-05	1.12E-04	3.30E+00	9.77E-07	5.21E-04
San Bernardino		2048 OBUS	Gasoline	6.74E-03	2.42E-01	1.49E-05	5.35E-04	3.40E-04	3.14E-05	2.65E-05	9.41E-05	2.22E-06	1.23E-04	6.61E-06	3.29E-05	2.04E-06	4.16E-05	3.37E+00	4.21E-06	3.35E-05
San Bernardino		2048 OBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.71E-05	0.00E+00	7.35E-05	6.61E-06	1.65E-05	0.00E+00	2.31E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 PTO	Diesel	1.39E-02	2.41E+00	3.06E-05	5.30E-03	3.80E-04	3.59E-05	0.00E+00	0.00E+00	8.45E-06	8.45E-06	0.00E+00	0.00E+00	0.00E+00	8.08E-06	3.80E+00	1.42E-06	5.98E-04
San Bernardino		2048 PTO	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 SBUS	Gasoline	1.11E-02	1.28E-01	2.44E-05	2.83E-04	4.53E-04	1.74E-05	1.76E-05	1.03E-04	3.69E-06	1.25E-04	4.41E-06	3.61E-05	3.39E-06	4.39E-05	1.76E+00	5.79E-06	2.61E-05
San Bernardino		2048 SBUS	Diesel	9.92E-03	4.15E-01	2.19E-05	9.14E-04	1.46E-04	2.37E-05	2.65E-05	1.03E-04	7.58E-06	1.37E-04	6.61E-06	3.61E-05	7.25E-06	5.00E-05	2.50E+00	1.02E-06	3.94E-04
San Bernardino		2048 SBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-05	5.16E-05	0.00E+00	7.53E-05	5.92E-06	1.81E-05	0.00E+00	2.40E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 SBUS	Natural Gas	4.57E-02	2.28E-01	1.01E-04	5.04E-04	1.97E-02	0.00E+00	2.65E-05	1.03E-04	9.88E-06	1.40E-04	6.61E-06	3.61E-05	9.09E-06	5.18E-05	3.20E+00	7.04E-03	6.53E-04
San Bernardino		2048 T6 CAIRP Class 4	Diesel	4.95E-03	1.62E-01	1.09E-05	3.57E-04	5.75E-05	2.08E-05	2.65E-05	9.22E-05	1.13E-05	1.30E-04	6.61E-06	3.23E-05	1.08E-05	4.97E-05	2.20E+00	5.07E-07	3.46E-04
San Bernardino		2048 T6 CAIRP Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.61E-05	0.00E+00	7.26E-05	6.61E-06	1.61E-05	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 T6 CAIRP Class 5	Diesel	4.95E-03	1.62E-01	1.09E-05	3.58E-04	5.75E-05	2.08E-05	2.65E-05	9.22E-05	1.13E-05	1.30E-04	6.61E-06	3.23E-05	1.08E-05	4.97E-05	2.20E+00	5.07E-07	3.47E-04
San Bernardino		2048 T6 CAIRP Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.61E-05	0.00E+00	7.26E-05	6.61E-06	1.61E-05	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 T6 CAIRP Class 6	Diesel	4.95E-03	1.64E-01	1.09E-05	3.61E-04	5.75E-05	2.08E-05	2.65E-05	9.22E-05	1.14E-05	1.30E-04	6.61E-06	3.23E-05	1.09E-05	4.98E-05	2.20E+00	5.06E-07	3.46E-04
San Bernardino		2048 T6 CAIRP Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.61E-05	0.00E+00	7.26E-05	6.61E-06	1.61E-05	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 T6 CAIRP Class 7	Diesel	5.36E-03	1.79E-01	1.18E-05	3.95E-04	6.23E-05	1.84E-05	2.65E-05	9.22E-05	1.21E-05	1.31E-04	6.61E-06	3.23E-05	1.16E-05	5.05E-05	1.94E+00	5.49E-07	3.06E-04
San Bernardino		2048 T6 CAIRP Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.61E-05	0.00E+00	7.26E-05	6.61E-06	1.61E-05	0.00E+00	2.28E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 T6 CAIRP Class 7	Natural Gas	7.33E-03	4.39E-02	1.62E-05	9.68E-05	3.32E-03	0.00E+00	2.65E-05	9.33E-05	2.42E-06	1.22E-04	6.61E-06	3.27E-05	2.22E-06	4.15E-05	1.60E+00	1.13E-03	3.25E-04
San Bernardino		2048 T6 Instate Delivery Class 4	Diesel	4.78E-03	1.92E-01	1.05E-05	4.24E-04	7.17E-05	2.04E-05	2.65E-05	9.38E-05	8.95E-06	1.29E-04	6.61E-06	3.28E-05	8.56E-06	4.80E-05	2.16E+00	4.89E-07	3.40E-04
San Bernardino		2048 T6 Instate Delivery Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.69E-05	0.00E+00	7.34E-05	6.61E-06	1.64E-05	0.00E+00	2.30E-05	0.00E+00	0.00E+00	0.00E+00
San Bernardino		2048 T6 Instate Delivery Class 4	Natural Gas	7.81E-03	4.58E-02	1.72E-05	1.01E-04	3.89E-03	0.00E+00	2.65E-05	9.40E-05	2.58E-06	1.23E-04	6.61E-06						

San Bernardino	2048 T6 Public Class 4	Diesel	5.54E-03	2.67E-01	1.22E-05	5.89E-04	6.67E-05	2.08E-05	2.65E-05	9.31E-05	1.11E-05	1.31E-04	6.61E-06	3.26E-05	1.06E-05	4.98E-05	2.20E+00	5.67E-07	3.46E-04
San Bernardino	2048 T6 Public Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.30E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 4	Natural Gas	7.31E-03	4.57E-02	1.61E-05	1.01E-04	3.36E-03	0.00E+00	2.65E-05	9.33E-05	2.39E-06	1.22E-04	6.61E-06	3.27E-05	2.20E-06	4.15E-05	1.65E+00	1.13E-03	
San Bernardino	2048 T6 Public Class 5	Diesel	5.29E-03	2.58E-01	1.17E-05	5.69E-04	6.57E-05	2.09E-05	2.65E-05	9.32E-05	1.07E-05	1.30E-04	6.61E-06	3.26E-05	1.02E-05	4.94E-05	2.21E+00	5.41E-07	
San Bernardino	2048 T6 Public Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 5	Natural Gas	7.23E-03	5.41E-02	1.59E-05	1.19E-04	3.54E-03	0.00E+00	2.65E-05	9.34E-05	2.30E-06	1.22E-04	6.61E-06	3.27E-05	2.12E-06	4.14E-05	1.66E+00	1.12E-03	
San Bernardino	2048 T6 Public Class 6	Diesel	5.14E-03	2.26E-01	1.13E-05	4.98E-04	6.42E-05	2.08E-05	2.65E-05	9.32E-05	1.02E-05	1.30E-04	6.61E-06	3.26E-05	9.76E-06	4.90E-05	2.20E+00	5.27E-07	
San Bernardino	2048 T6 Public Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 6	Natural Gas	7.33E-03	4.77E-02	1.62E-05	1.05E-04	3.44E-03	0.00E+00	2.65E-05	9.34E-05	2.39E-06	1.22E-04	6.61E-06	3.27E-05	2.19E-06	4.15E-05	1.66E+00	1.13E-03	
San Bernardino	2048 T6 Public Class 7	Diesel	4.75E-03	2.11E-01	1.05E-05	4.66E-04	6.18E-05	2.06E-05	2.65E-05	9.32E-05	9.84E-06	1.29E-04	6.61E-06	3.26E-05	9.41E-06	4.86E-05	2.17E+00	4.86E-07	
San Bernardino	2048 T6 Public Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 7	Natural Gas	7.37E-03	4.50E-02	1.62E-05	9.92E-05	3.40E-03	0.00E+00	2.65E-05	9.34E-05	2.42E-06	1.22E-04	6.61E-06	3.27E-05	2.23E-06	4.15E-05	1.65E+00	1.14E-03	
San Bernardino	2048 T6 Utility Class 5	Diesel	3.76E-03	1.28E-01	8.29E-06	2.82E-04	5.19E-05	2.04E-05	2.65E-05	9.33E-05	8.28E-06	1.28E-04	6.61E-06	3.26E-05	7.92E-06	4.72E-05	2.16E+00	3.85E-07	
San Bernardino	2048 T6 Utility Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Utility Class 5	Natural Gas	7.50E-03	4.40E-02	1.65E-05	9.70E-05	3.51E-03	0.00E+00	2.65E-05	9.35E-05	2.48E-06	1.22E-04	6.61E-06	3.27E-05	2.28E-06	4.16E-05	1.66E+00	1.16E-03	
San Bernardino	2048 T6 Utility Class 6	Diesel	3.76E-03	1.25E-01	8.29E-06	2.76E-04	5.19E-05	2.04E-05	2.65E-05	9.33E-05	8.23E-06	1.28E-04	6.61E-06	3.26E-05	7.88E-06	4.71E-05	2.16E+00	3.85E-07	
San Bernardino	2048 T6 Utility Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Utility Class 6	Natural Gas	7.50E-03	4.40E-02	1.65E-05	9.70E-05	3.51E-03	0.00E+00	2.65E-05	9.35E-05	2.48E-06	1.22E-04	6.61E-06	3.27E-05	2.28E-06	4.16E-05	1.66E+00	1.16E-03	
San Bernardino	2048 T6 Utility Class 7	Diesel	3.72E-03	1.22E-01	8.21E-06	2.69E-04	5.14E-05	2.05E-05	2.65E-05	9.33E-05	8.19E-06	1.28E-04	6.61E-06	3.26E-05	7.83E-06	4.71E-05	2.16E+00	3.81E-07	
San Bernardino	2048 T6 Utility Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.66E-05	0.00E+00	7.31E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Utility Class 7	Natural Gas	7.50E-03	4.40E-02	1.65E-05	9.70E-05	3.51E-03	0.00E+00	2.65E-05	9.35E-05	2.48E-06	1.22E-04	6.61E-06	3.27E-05	2.28E-06	4.16E-05	1.66E+00	1.16E-03	
San Bernardino	2048 T6TS	Gasoline	7.83E-03	6.10E-02	1.73E-05	1.34E-04	3.29E-04	3.05E-05	2.65E-05	9.29E-05	2.33E-06	1.22E-04	6.61E-06	3.25E-05	2.14E-06	4.13E-05	3.08E+00	4.87E-06	
San Bernardino	2048 T6TS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.65E-05	4.64E-05	0.00E+00	7.29E-05	6.61E-06	1.63E-05	0.00E+00	2.29E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 CAIRP Class 8	Diesel	1.10E-02	1.12E+00	2.43E-05	2.46E-03	6.61E-05	2.65E-05	7.94E-05	1.75E-04	6.75E-05	3.22E-04	1.98E-05	6.12E-05	6.46E-05	1.46E-04	2.80E+00	1.13E-06	
San Bernardino	2048 T7 CAIRP Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.75E-05	0.00E+00	1.67E-04	1.98E-05	3.06E-05	0.00E+00	5.05E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 CAIRP Class 8	Natural Gas	1.29E-02	1.51E-01	2.84E-05	3.32E-04	6.10E-03	0.00E+00	7.94E-05	1.81E-04	4.12E-06	2.64E-04	1.98E-05	6.33E-05	3.79E-06	8.69E-05	2.22E+00	1.98E-03	
San Bernardino	2048 T7 NNOOS Class 8	Diesel	1.07E-02	1.23E+00	2.36E-05	2.72E-03	6.43E-05	2.53E-05	7.94E-05	1.75E-04	6.67E-05	3.21E-04	1.98E-05	6.12E-05	6.38E-05	1.45E-04	2.68E+00	1.10E-06	
San Bernardino	2048 T7 NOOS Class 8	Diesel	1.10E-02	1.27E+00	2.43E-05	2.80E-03	6.63E-05	2.53E-05	7.94E-05	1.75E-04	7.06E-05	3.25E-04	1.98E-05	6.13E-05	6.75E-05	1.49E-04	2.68E+00	1.13E-06	
San Bernardino	2048 T7 POLA Class 8	Diesel	1.00E-02	1.11E+00	2.21E-05	2.45E-03	7.60E-05	2.83E-05	7.94E-05	1.81E-04	5.65E-05	1.37E-04	1.98E-05	6.33E-05	5.40E-05	1.37E-04	2.99E+00	1.03E-06	
San Bernardino	2048 T7 POLA Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	9.09E-05	0.00E+00	1.70E-04	1.98E-05	3.18E-05	0.00E+00	5.17E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 POLA Class 8	Natural Gas	1.29E-02	1.51E-01	2.85E-05	3.33E-04	6.23E-03	0.00E+00	7.94E-05	1.81E-04	4.14E-06	2.65E-04	1.98E-05	6.34E-05	3.80E-06	8.70E-05	2.23E+00	1.99E-03	
San Bernardino	2048 T7 Public Class 8	Diesel	1.56E-02	1.41E+00	3.44E-05	3.11E-03	1.25E-04	3.13E-05	7.94E-05	1.79E-04	4.33E-05	3.01E-04	1.98E-05	6.26E-05	4.15E-05	1.24E-04	3.31E+00	1.60E-06	
San Bernardino	2048 T7 Public Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	9.09E-05	0.00E+00	1.70E-04	1.98E-05	3.18E-05	0.00E+00	5.17E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Public Class 8	Natural Gas	1.30E-02	1.67E-01	2.87E-05	3.68E-04	7.07E-03	0.00E+00	7.94E-05	1.80E-04	4.10E-06	2.64E-04	1.98E-05	6.31E-05	3.77E-06	8.67E-05	2.34E+00	2.01E-03	
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Diesel	7.92E-03	6.77E-01	1.75E-05	1.49E-03	6.24E-05	2.97E-05	7.94E-05	1.83E-04	3.33E-05	2.96E-04	1.98E-05	6.41E-05	3.18E-05	1.16E-04	3.13E+00	8.11E-07	
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	9.17E-05	0.00E+00	1.71E-04	1.98E-05	3.21E-05	0.00E+00	5.19E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.31E-02	1.52E-01	2.90E-05	3.35E-04	6.61E-03	0.00E+00	7.94E-05	1.84E-04	4.20E-06	2.68E-04	1.98E-05	6.44E-05	3.87E-06	8.81E-05	2.31E+00	2.03E-03	
San Bernardino	2048 T7 Single Dump Class 8	Diesel	9.46E-03	9.10E-01	2.09E-05	2.01E-03	7.92E-05	3.03E-05	7.94E-05	1.80E-04	4.25E-05	3.02E-04	1.98E-05	6.31E-05	4.06E-05	1.24E-04	3.20E+00	9.69E-07	
San Bernardino	2048 T7 Single Dump Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	9.14E-05	0.00E+00	1.71E-04	1.98E-05	3.20E-05	0.00E+00	5.18E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Single Dump Class 8	Natural Gas	1.31E-02	1.70E-01	2.89E-05	3.74E-04	7.29E-03	0.00E+00	7.94E-05	1.82E-04	4.11E-06	2.65E-04	1.98E-05	6.35E-05	3.78E-06	8.72E-05	2.35E+00	2.02E-03	
San Bernardino	2048 T7 Single Other Class 8	Diesel	8.65E-03	8.16E-01	1.91E-05	1.80E-03	7.06E-05	3.00E-05	7.94E-05	1.82E-04	3.90E-05	3.00E-04	1.98E-05	6.36E-05	3.74E-05	1.21E-04	3.17E+00	8.86E-07	
San Bernardino	2048 T7 Single Other Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	9.18E-05	0.00E+00	1.71E-04	1.98E-05	3.21E-05	0.00E+00	5.20E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Single Other Class 8	Natural Gas	1.31E-02	1.58E-01	2.90E-05	3.48E-04	6.85E-03	0.00E+00	7.94E-05	1.82E-04	4.18E-06	2.66E-04	1.98E-05	6.39E-05	3.84E-06	8.75E-05	2.33E+00	2.03E-03	
San Bernardino	2048 T7 SWCV Class 8	Diesel	1.54E-02	3.01E+00	3.40E-05	6.65E-03	3.71E-05	6.70E-05	7.94E-05	4.63E-04	6.96E-05	6.12E-04	1.98E-05	1.62E-04	6.66E-05	2.48E-04	7.07E+00	1.58E-06	
San Bernardino	2048 T7 SWCV Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	2.31E-04	0.00E+00	3.11E-04	1.98E-05	8.10E-05	0.00E+00	1.01E-04	0.00E+00	0.00E+00	
San Bernardino	2048 T7 SWCV Class 8	Natural Gas	6.57E-03	2.00E-01	1.45E-05	4.40E-04	1.30E-02	0.00E+00	7.94E-05	4.63E-04	1.57E-06	5.44E-04	1.98E-05	1.62E-04	1.45E-06	1.83E-04	2.03E+00	8.69E-04	
San Bernardino	2048 T7 Tractor Class 8	Diesel	1.00E-02	1.08E+00	2.21E-05	2.38E-03	6.91E-05	2.64E-05	7.94E-05	1.79E-04	5.58E-05	3.14E-04	1.98E-05	6.25E-05	5.34E-05	1.36E-04	2.79E+00	1.03E-06	
San Bernardino	2048 T7 Tractor Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	8.97E-05	0.00E+00	1.69E-04	1.98E-05	3.14E-05	0.00E+00	5.12E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Tractor Class 8	Natural Gas	1.29E-02	1.53E-01	2.85E-05	3.38E-04	6.31E-03	0.00E+00	7.94E-05	1.81E-04	4.13E-06	2.64E-04	1.98E-05	6.32E-05	3.80E-06	8.69E-05	2.24E+00	1.99E-03	
San Bernardino	2048 T7 Utility Class 8	Diesel	8.52E-03	7.39E-01	1.88E-05	1.63E-03	7.53E-05	3.07E-05	7.94E-05	1.77E-04	3.30E-05	2.90E-04	1.98E-05	6.21E-05	3.16E-05	1.14E-04	3.24E+00	8.72E-07	
San Bernardino	2048 T7 Utility Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.94E-05	9.08E-05	0.00E+00	1.70E-04	1.98E-05	3.18E-05	0.00E+00	5.16E-05	0.00E+00	0.00E+00	
San Bernardino	2048 T7IS	Gasoline	3.00E-01</																

Source: EMFAC2021 (v1.0.2) Emission Rates
Region Type: County
Region: San Bernardino
Calendar Year: 2048
Season: Annual
Vehicle Classification: EMFAC202x Categories
Units: miles/day for CVMT and EVMT, trips/day for Trips, g/mile for I

MTons/Mile																				
Region	Calendar Year	Vehicle Category	Fuel	ROG_RUNEX	NOx_RUNEX	ROG_RUNEX	NOx_RUNEX	CO_RUNEX	SOx_RUNEX	PM10_PMTW	PM10_PMBW	PM10_RUNEX	PM10_Total	PM2_5_PMTW	PM2_5_PMBW	PM2_5_RUNEX	PM2_5_Total	CO2_RUNEX	CH4_RUNEX	N2O_RUNEX
San Bernardino	2048	All Other Buses	Diesel	1.32E-02	6.73E-01	1.32E-08	6.73E-07	7.01E-08	9.02E-09	1.20E-08	4.33E-08	9.04E-09	6.43E-08	3.00E-09	1.51E-08	8.65E-09	2.68E-08	9.53E-04	6.15E-10	1.50E-07
San Bernardino	2048	All Other Buses	Natural Gas	8.62E-03	6.94E-02	8.62E-09	6.94E-08	2.27E-06	0.00E+00	1.20E-08	4.38E-08	1.22E-09	5.70E-08	3.00E-09	1.53E-08	1.13E-09	1.94E-08	7.67E-04	6.03E-07	1.56E-07
San Bernardino	2048	LDA	Gasoline	2.78E-03	1.90E-02	2.78E-09	1.90E-08	4.83E-07	2.25E-09	8.00E-09	6.76E-09	4.77E-10	1.52E-08	2.00E-09	2.37E-09	4.38E-10	4.80E-09	2.27E-04	9.77E-10	3.18E-09
San Bernardino	2048	LDA	Diesel	3.72E-03	1.14E-02	3.72E-09	1.14E-08	1.16E-07	1.74E-09	8.00E-09	6.76E-09	9.21E-10	1.57E-08	2.00E-09	2.37E-09	8.81E-10	5.25E-09	1.83E-04	1.73E-10	2.89E-08
San Bernardino	2048	LDA	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.39E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	LDA	Plug-in Hybrid	1.05E-03	2.46E-03	1.05E-09	2.46E-09	1.80E-07	1.09E-09	8.00E-09	3.89E-09	1.95E-10	1.21E-08	2.00E-09	1.36E-09	1.79E-10	3.54E-09	1.11E-04	3.26E-10	4.26E-10
San Bernardino	2048	LDT1	Gasoline	3.04E-03	2.05E-02	3.04E-09	2.05E-08	5.16E-07	2.59E-09	8.00E-09	7.97E-09	5.14E-10	1.65E-08	2.00E-09	2.79E-09	4.73E-10	5.26E-09	2.62E-04	1.04E-09	3.29E-09
San Bernardino	2048	LDT1	Diesel	1.09E-02	2.57E-02	1.09E-08	2.57E-08	1.17E-07	3.23E-09	8.00E-09	7.92E-09	4.02E-09	1.99E-08	2.00E-09	2.77E-09	3.84E-09	8.61E-09	3.41E-04	5.07E-10	5.38E-08
San Bernardino	2048	LDT1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.40E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	LDT1	Plug-in Hybrid	1.05E-03	2.45E-03	1.05E-09	2.45E-09	1.79E-07	1.09E-09	8.00E-09	3.89E-09	1.92E-10	1.21E-08	2.00E-09	1.36E-09	1.76E-10	3.54E-09	1.10E-04	3.22E-10	4.18E-10
San Bernardino	2048	LDT2	Gasoline	3.87E-03	2.15E-02	3.87E-09	2.15E-08	5.67E-07	2.68E-09	8.00E-09	7.87E-09	4.88E-10	1.64E-08	2.00E-09	2.76E-09	4.49E-10	5.20E-09	2.71E-04	1.29E-09	3.37E-09
San Bernardino	2048	LDT2	Diesel	1.09E-02	2.61E-02	1.09E-08	2.61E-08	1.14E-07	2.39E-09	8.00E-09	7.87E-09	3.97E-09	1.98E-08	2.00E-09	2.75E-09	3.79E-09	8.55E-09	2.53E-04	5.05E-10	3.98E-08
San Bernardino	2048	LDT2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.40E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	LDT2	Plug-in Hybrid	1.05E-03	2.45E-03	1.05E-09	2.45E-09	1.80E-07	1.09E-09	8.00E-09	3.89E-09	1.93E-10	1.21E-08	2.00E-09	1.36E-09	1.78E-10	3.54E-09	1.11E-04	3.22E-10	4.18E-10
San Bernardino	2048	LHD1	Gasoline	1.55E-03	1.81E-02	1.55E-09	1.81E-08	6.33E-07	4.79E-09	8.00E-09	7.80E-08	1.14E-09	8.71E-08	2.00E-09	2.73E-08	1.05E-09	3.04E-08	4.85E-04	4.77E-10	1.77E-09
San Bernardino	2048	LHD1	Diesel	3.60E-02	1.86E-01	3.60E-08	1.86E-07	6.83E-08	4.36E-09	1.20E-08	7.80E-08	1.10E-08	1.01E-07	3.00E-09	2.73E-08	1.06E-08	4.09E-08	4.60E-04	1.67E-09	7.25E-08
San Bernardino	2048	LHD1	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	3.90E-08	0.00E+00	4.70E-08	2.00E-09	1.37E-08	0.00E+00	1.57E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	LHD2	Gasoline	1.41E-03	2.40E-02	1.41E-09	2.40E-08	6.43E-07	5.40E-09	8.00E-09	9.10E-08	1.14E-09	1.00E-07	2.00E-09	3.19E-08	1.05E-09	3.49E-08	5.46E-04	4.40E-10	2.51E-09
San Bernardino	2048	LHD2	Diesel	4.87E-02	3.00E-01	4.87E-08	3.00E-07	9.38E-08	5.10E-09	1.20E-08	9.10E-08	1.51E-08	1.18E-07	3.00E-09	3.19E-08	1.45E-08	4.93E-08	5.39E-04	2.26E-09	8.49E-08
San Bernardino	2048	LHD2	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.55E-08	0.00E+00	5.35E-08	2.00E-09	1.59E-08	0.00E+00	1.79E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	MCY	Gasoline	7.50E-01	4.55E-01	7.50E-07	4.55E-07	9.17E-06	1.81E-09	4.00E-09	1.20E-08	2.10E-09	1.81E-08	1.00E-09	4.20E-09	1.95E-09	7.15E-09	1.83E-04	1.27E-07	3.47E-08
San Bernardino	2048	MDV	Gasoline	4.05E-03	2.25E-02	4.05E-09	2.25E-08	5.89E-07	3.25E-09	8.00E-09	8.02E-09	4.94E-10	1.65E-08	2.00E-09	2.81E-09	4.55E-10	5.26E-09	3.29E-04	1.35E-09	3.47E-09
San Bernardino	2048	MDV	Diesel	4.23E-03	1.70E-02	4.23E-09	1.70E-08	1.29E-07	3.14E-09	8.00E-09	8.03E-09	1.12E-09	1.71E-08	2.00E-09	2.81E-09	1.07E-09	5.88E-09	3.32E-04	1.96E-10	5.23E-08
San Bernardino	2048	MDV	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.00E-09	4.40E-09	0.00E+00	1.24E-08	2.00E-09	1.54E-09	0.00E+00	3.54E-09	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	MDV	Plug-in Hybrid	1.05E-03	2.46E-03	1.05E-09	2.46E-09	1.80E-07	1.09E-09	8.00E-09	3.90E-09	1.96E-10	1.21E-08	2.00E-09	1.36E-09	1.80E-10	3.54E-09	1.11E-04	3.23E-10	4.18E-10
San Bernardino	2048	MH	Gasoline	7.44E-03	2.10E-01	7.44E-09	2.10E-07	1.37E-07	1.75E-08	1.20E-08	4.22E-08	1.04E-09	5.52E-08	3.00E-09	1.48E-08	9.58E-10	1.87E-08	1.77E-03	2.73E-09	1.83E-08
San Bernardino	2048	MH	Diesel	2.92E-02	1.73E+00	2.92E-08	1.73E-06	9.63E-08	9.39E-09	1.60E-08	4.21E-08	2.58E-08	8.39E-08	4.00E-09	1.47E-08	2.47E-08	4.34E-08	9.91E-04	1.36E-09	1.56E-07
San Bernardino	2048	Motor Coach	Diesel	9.54E-03	9.20E-01	9.54E-09	9.20E-07	5.41E-08	1.42E-08	1.20E-08	9.10E-08	1.68E-08	1.20E-07	3.00E-09	3.19E-08	1.61E-08	5.09E-08	1.50E-03	4.43E-10	2.36E-07
San Bernardino	2048	OBUS	Gasoline	6.74E-03	2.42E-01	6.74E-09	2.42E-07	1.54E-07	1.42E-08	1.20E-08	4.27E-08	1.01E-09	5.57E-08	3.00E-09	1.49E-08	9.25E-10	1.89E-08	1.44E-03	1.91E-09	1.52E-08
San Bernardino	2048	OBUS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.13E-08	0.00E+00	3.33E-08	3.00E-09	7.47E-09	0.00E+00	1.05E-08	0.00E+00	0.00E+00	0.00E+00
San Bernardino	2048	PTO	Diesel	1.39E-02	2.41E+00	1.39E-08	2.41E-06	1.72E-07	1.63E-08	0.00E+00	0.00E+00	3.83E-09	0.00E+00	0.00E+00	0.00E+00	3.67E-09	3.67E-09	1.72E-03	6.44E-10	2.71E-07
San Bernardino	2048	PTO	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00</							

San Bernardino	2048 T6 Public Class 4	Diesel	5.54E-03	2.67E-01	5.54E-09	2.67E-07	3.02E-08	9.44E-09	1.20E-08	4.22E-08	5.04E-09	5.93E-08	3.00E-09	1.48E-08	4.82E-09	2.26E-08	9.97E-04	2.57E-10	1.57E-07
San Bernardino	2048 T6 Public Class 4	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.39E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 4	Natural Gas	7.31E-03	4.57E-02	7.31E-09	4.57E-08	1.52E-06	0.00E+00	1.20E-08	4.23E-08	1.08E-09	5.54E-08	3.00E-09	1.48E-08	9.97E-10	1.88E-08	7.47E-04	5.12E-07	
San Bernardino	2048 T6 Public Class 5	Diesel	5.29E-03	2.58E-01	5.29E-09	2.58E-07	2.98E-08	9.48E-09	1.20E-08	4.23E-08	4.85E-09	5.91E-08	3.00E-09	1.48E-08	4.64E-09	2.24E-08	1.00E-03	2.46E-10	
San Bernardino	2048 T6 Public Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 5	Natural Gas	7.23E-03	5.41E-02	7.23E-09	5.41E-08	1.61E-06	0.00E+00	1.20E-08	4.24E-08	1.04E-09	5.54E-08	3.00E-09	1.48E-08	9.61E-10	1.88E-08	7.53E-04	5.06E-07	
San Bernardino	2048 T6 Public Class 6	Diesel	5.14E-03	2.26E-01	5.14E-09	2.26E-07	2.91E-08	9.45E-09	1.20E-08	4.23E-08	4.63E-09	5.89E-08	3.00E-09	1.48E-08	4.43E-09	2.22E-08	9.98E-04	2.39E-10	
San Bernardino	2048 T6 Public Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 6	Natural Gas	7.33E-03	4.77E-02	7.33E-09	4.77E-08	1.56E-06	0.00E+00	1.20E-08	4.24E-08	1.08E-09	5.54E-08	3.00E-09	1.48E-08	9.96E-10	1.88E-08	7.51E-04	5.13E-07	
San Bernardino	2048 T6 Public Class 7	Diesel	4.75E-03	2.11E-01	4.75E-09	2.11E-07	2.80E-08	9.32E-09	1.20E-08	4.23E-08	4.46E-09	5.87E-08	3.00E-09	1.48E-08	4.27E-09	2.21E-08	9.84E-04	2.20E-10	
San Bernardino	2048 T6 Public Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Public Class 7	Natural Gas	7.37E-03	4.50E-02	7.37E-09	4.50E-08	1.54E-06	0.00E+00	1.20E-08	4.24E-08	1.10E-09	5.55E-08	3.00E-09	1.48E-08	1.01E-09	1.88E-08	7.50E-04	5.16E-07	
San Bernardino	2048 T6 Public Class 5	Diesel	3.76E-03	1.28E-01	3.76E-09	1.28E-07	2.36E-08	9.27E-09	1.20E-08	4.23E-08	3.76E-09	5.81E-08	3.00E-09	1.48E-08	3.59E-09	2.14E-08	9.79E-04	1.75E-10	
San Bernardino	2048 T6 Utility Class 5	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Utility Class 5	Natural Gas	7.50E-03	4.40E-02	7.50E-09	4.40E-08	1.59E-06	0.00E+00	1.20E-08	4.24E-08	1.12E-09	5.56E-08	3.00E-09	1.49E-08	1.03E-09	1.89E-08	7.53E-04	5.25E-07	
San Bernardino	2048 T6 Utility Class 6	Diesel	3.76E-03	1.25E-01	3.76E-09	1.25E-07	2.36E-08	9.27E-09	1.20E-08	4.23E-08	3.73E-09	5.80E-08	3.00E-09	1.48E-08	3.57E-09	2.14E-08	9.79E-04	1.75E-10	
San Bernardino	2048 T6 Utility Class 6	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Utility Class 6	Natural Gas	7.50E-03	4.40E-02	7.50E-09	4.40E-08	1.59E-06	0.00E+00	1.20E-08	4.24E-08	1.12E-09	5.56E-08	3.00E-09	1.49E-08	1.03E-09	1.89E-08	7.53E-04	5.25E-07	
San Bernardino	2048 T6 Utility Class 7	Diesel	3.72E-03	1.22E-01	3.72E-09	1.22E-07	2.33E-08	9.28E-09	1.20E-08	4.23E-08	3.71E-09	5.80E-08	3.00E-09	1.48E-08	3.55E-09	2.14E-08	9.80E-04	1.73E-10	
San Bernardino	2048 T6 Utility Class 7	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.12E-08	0.00E+00	3.32E-08	3.00E-09	7.40E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T6 Utility Class 7	Natural Gas	7.50E-03	4.40E-02	7.50E-09	4.40E-08	1.59E-06	0.00E+00	1.20E-08	4.24E-08	1.12E-09	5.56E-08	3.00E-09	1.49E-08	1.03E-09	1.89E-08	7.53E-04	5.25E-07	
San Bernardino	2048 T6TS	Gasoline	7.83E-03	6.10E-02	7.83E-09	6.10E-08	1.49E-07	1.38E-08	1.20E-08	4.21E-08	1.06E-09	5.52E-08	3.00E-09	1.47E-08	9.70E-10	1.87E-08	1.40E-03	2.21E-09	
San Bernardino	2048 T6TS	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E-08	2.11E-08	0.00E+00	3.31E-08	3.00E-09	7.37E-09	0.00E+00	1.04E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 CAIRP Class 8	Diesel	1.10E-02	1.12E+00	1.10E-08	1.12E-06	3.00E-08	1.20E-08	3.60E-08	7.94E-08	3.06E-08	1.46E-07	9.00E-09	2.78E-08	2.93E-08	6.61E-08	1.27E-03	5.11E-10	
San Bernardino	2048 T7 CAIRP Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	3.97E-08	0.00E+00	7.57E-08	9.00E-09	1.39E-08	0.00E+00	2.29E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 CAIRP Class 8	Natural Gas	1.29E-02	1.51E-01	1.29E-08	1.51E-07	2.77E-06	0.00E+00	3.60E-08	8.20E-08	1.87E-09	1.20E-07	9.00E-09	2.87E-08	1.72E-09	3.94E-08	1.01E-03	9.00E-07	
San Bernardino	2048 T7 NNOOS Class 8	Diesel	1.07E-02	1.23E+00	1.07E-08	1.23E-06	2.92E-08	1.15E-08	3.60E-08	7.94E-08	3.02E-08	1.46E-07	9.00E-09	2.78E-08	2.89E-08	6.57E-08	1.21E-03	4.97E-10	
San Bernardino	2048 T7 NOOS Class 8	Diesel	1.10E-02	1.27E+00	1.10E-08	1.27E-06	3.01E-08	1.15E-08	3.60E-08	7.94E-08	3.20E-08	1.47E-07	9.00E-09	2.78E-08	3.06E-08	6.74E-08	1.21E-03	5.13E-10	
San Bernardino	2048 T7 POLA Class 8	Diesel	1.00E-02	1.11E+00	1.00E-08	1.11E-06	3.45E-08	1.28E-08	3.60E-08	8.21E-08	2.56E-08	1.44E-07	9.00E-09	2.87E-08	2.45E-08	6.22E-08	1.35E-03	4.67E-10	
San Bernardino	2048 T7 POLA Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.12E-08	0.00E+00	7.72E-08	9.00E-09	1.44E-08	0.00E+00	2.34E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 POLA Class 8	Natural Gas	1.29E-02	1.51E-01	1.29E-08	1.51E-07	2.83E-06	0.00E+00	3.60E-08	8.22E-08	1.88E-09	1.20E-07	9.00E-09	2.88E-08	1.72E-09	3.95E-08	1.01E-03	9.05E-07	
San Bernardino	2048 T7 Public Class 8	Diesel	1.56E-02	1.41E+00	1.56E-08	1.41E-06	5.69E-08	1.42E-08	3.60E-08	8.11E-08	1.97E-08	1.37E-07	9.00E-09	2.84E-08	1.88E-08	5.62E-08	1.50E-03	7.25E-10	
San Bernardino	2048 T7 Public Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.12E-08	0.00E+00	7.72E-08	9.00E-09	1.44E-08	0.00E+00	2.34E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Public Class 8	Natural Gas	1.30E-02	1.67E-01	1.30E-08	1.67E-07	3.21E-06	0.00E+00	3.60E-08	8.18E-08	1.86E-09	1.20E-07	9.00E-09	2.86E-08	1.71E-09	3.93E-08	1.06E-03	9.12E-07	
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Diesel	7.92E-03	6.77E-01	7.92E-09	6.77E-07	2.83E-08	1.35E-08	3.60E-08	8.31E-08	1.51E-08	1.34E-07	9.00E-09	2.91E-08	1.44E-08	5.25E-08	1.42E-03	3.68E-10	
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.16E-08	0.00E+00	7.76E-08	9.00E-09	1.46E-08	0.00E+00	2.36E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Single Concrete/Transit Mix Class 8	Natural Gas	1.31E-02	1.52E-01	1.31E-08	1.52E-07	3.00E-06	0.00E+00	3.60E-08	8.35E-08	1.91E-09	1.21E-07	9.00E-09	2.92E-08	1.75E-09	4.00E-08	1.05E-03	9.20E-07	
San Bernardino	2048 T7 Single Dump Class 8	Diesel	9.46E-03	9.10E-01	9.46E-09	9.10E-07	3.59E-08	1.37E-08	3.60E-08	8.18E-08	1.93E-08	1.37E-07	9.00E-09	2.86E-08	1.84E-08	5.60E-08	1.45E-03	4.39E-10	
San Bernardino	2048 T7 Single Dump Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.15E-08	0.00E+00	7.75E-08	9.00E-09	1.45E-08	0.00E+00	2.35E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Single Dump Class 8	Natural Gas	1.31E-02	1.70E-01	1.31E-08	1.70E-07	3.31E-06	0.00E+00	3.60E-08	8.24E-08	1.86E-09	1.20E-07	9.00E-09	2.88E-08	1.71E-09	3.95E-08	1.06E-03	9.16E-07	
San Bernardino	2048 T7 Single Other Class 8	Diesel	8.65E-03	8.16E-01	8.65E-09	8.16E-07	3.20E-08	1.36E-08	3.60E-08	8.24E-08	1.77E-08	1.36E-07	9.00E-09	2.88E-08	1.69E-08	5.48E-08	1.44E-03	4.02E-10	
San Bernardino	2048 T7 Single Other Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.16E-08	0.00E+00	7.76E-08	9.00E-09	1.46E-08	0.00E+00	2.36E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Single Other Class 8	Natural Gas	1.31E-02	1.58E-01	1.31E-08	1.58E-07	3.11E-06	0.00E+00	3.60E-08	8.28E-08	1.89E-09	1.21E-07	9.00E-09	2.90E-08	1.74E-09	3.97E-08	1.06E-03	9.19E-07	
San Bernardino	2048 T7 SWCV Class 8	Diesel	1.54E-02	3.01E+00	1.54E-08	3.01E-06	1.68E-08	3.04E-08	3.60E-08	2.10E-07	3.16E-08	2.78E-07	9.00E-09	7.35E-08	3.02E-08	1.13E-07	3.21E-03	7.16E-10	
San Bernardino	2048 T7 SWCV Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	1.05E-07	0.00E+00	1.41E-07	9.00E-09	3.68E-08	0.00E+00	4.58E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 SWCV Class 8	Natural Gas	6.57E-03	2.00E-01	6.57E-09	2.00E-07	5.92E-06	0.00E+00	3.60E-08	2.10E-07	7.13E-10	2.47E-07	9.00E-09	7.35E-08	6.56E-10	8.32E-08	9.21E-04	3.94E-07	
San Bernardino	2048 T7 Tractor Class 8	Diesel	1.00E-02	1.08E+00	1.00E-08	1.08E-06	3.13E-08	1.20E-08	3.60E-08	8.10E-08	2.53E-08	1.42E-07	9.00E-09	2.84E-08	2.42E-08	6.16E-08	1.27E-03	4.66E-10	
San Bernardino	2048 T7 Tractor Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.07E-08	0.00E+00	7.67E-08	9.00E-09	1.42E-08	0.00E+00	2.32E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7 Tractor Class 8	Natural Gas	1.29E-02	1.53E-01	1.29E-08	1.53E-07	2.86E-06	0.00E+00	3.60E-08	8.19E-08	1.87E-09	1.20E-07	9.00E-09	2.87E-08	1.72E-09	3.94E-08	1.02E-03	9.04E-07	
San Bernardino	2048 T7 Utility Class 8	Diesel	8.52E-03	7.39E-01	8.52E-09	7.39E-07	3.42E-08	1.39E-08	3.60E-08	8.04E-08	1.50E-08	1.31E-07	9.00E-09	2.82E-08	1.43E-08	5.15E-08	1.47E-03	3.96E-10	
San Bernardino	2048 T7 Utility Class 8	Electricity	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.60E-08	4.12E-08	0.00E+00	7.72E-08	9.00E-09	1.44E-08	0.00E+00	2.34E-08	0.00E+00	0.00E+00	
San Bernardino	2048 T7IS	Gasoline	3.00E-01</																

4. Energy Sector Emissions Calculations

This page intentionally left blank.

Electricity and Natural Gas Use Consumption for City of Barstow+SOI

Southern California Edison Electricity Use

	Annual KWH					Average 2019- 2023 Annual KWH
	2019	2020	2021	2022	2023	
Residential	53,811,718	60,538,633	61,934,930	61,573,410	56,736,719	58,919,082
Commercial + Industrial	73,621,198	69,094,806	73,348,512	76,796,597	77,806,532	74,133,529

Southwest Gas Natural Gas Use

	Annual Therms					Average 2019- 2023 Annual Therms
	2019	2020	2021	2022	2023	
Residential	3,048,505	2,949,346	2,614,839	2,762,414	2,933,743	2,861,769
Commercial/Industrial	1,955,906	1,770,364	2,021,743	1,795,750	2,095,903	1,927,933
Transportation ¹	368,867	494,055	164,465	160,413	190,452	275,650
CNG ²				60,508	326,747	193,628
Other ³	119,492	121,140	131,456	127,506	574,837	214,886

¹ Customers that procure their own gas, and it is delivered to the customer on Southwest Gas’ system

² Defined as ‘Natural Gas for Motor Vehicles’

³ Defined as ‘SML Electric Power Generation Gas Srvc * Electric Generation’ & ‘Military’

Sphere of Influence (SOI) and Planning Area Outside City and SOI

Area	Households	Nonresidential SqFt
City	8,769	10,157,592
SOI	3,109	913,999

Electricity*

Residential Annual KWH/Household:	6,719	kWH/household
Non-Residential Annual KWH/Sqft:	7.30	kWH/SqFt

* Annual use divided by residents/employees within the City of Barstow boundaries.

Area	Residential Annual kWH	Commercial + Industrial Annual kWH
SOI	20,889,432	6,670,673

Natural Gas*

Residential Annual Therms/Household:	326	therm/household
Non-Residential Annual Therms/SqFt:	0.19	therm/SqFt

* Annual use divided by residents/employees within the City of Barstow boundaries.

Area	Residential Annual Therms	Commercial + Industrial Annual Therms
SOI	1,014,624	173,479

Disclaimer. The 15/15 Rule is intended to protect customer confidentiality by reducing the possibility of identifying customers through the release of usage information. The utilities apply the 15/15 Rule in releasing aggregated customer information. The rule was initially implemented by the California Public Utilities Commission during Direct Access proceedings in 1997 and was adopted through D. 97-10-031. The 15/15 rule requires that any aggregated information provided by the Utilities must be made up of at least 15 customers, and a customer’s load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer’s load is more than 15% of the total data, categories (e.g., rate classes) must be combined before the information is released. The rule further requires that if the 15/15 rule is triggered for a second time after the data has been screened once already using the 15/15 rule, then the customer is dropped from the information provided.

City of Barstow General Plan: GHG Emissions from Energy Use

Southwest Gas				
	lbs/MMBTU	lbs/MMBTU	lbs/MMBTU	lbs/MMBTU
	CO ₂	CH ₄	N ₂ O	CO ₂ e
All Years	117	0.01040	0.00020	117.3
	MT/Therm	MT/Therm	MT/Therm	MT/Therm
	CO ₂	CH ₄	N ₂ O	CO ₂ e
All Years	0.00531	4.72E-07	9.07E-09	0.005

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. <https://www.caleemod.com/user-guide>. Table G-4, Natural Gas Emissions Factors (pounds per MMBTU).

SCE				
	Intensity factor (lbs/MWH)			CO ₂ e
	CO ₂ lbs/MWH	CH ₄ lbs/MWH	N ₂ O lbs/MWH	lbs/MWh
2023 ^a	372.0	0.033	0.004	374.0
2048 ^b	0.000	0.000	0.000	0.0
	Intensity factor (MTons/MWH)			CO ₂ e
	CO ₂ MTons/MWH	CH ₄ MTons/MWH	N ₂ O MTons/MWH	MTons/MWh
2023	0.169	1.50E-05	1.81E-06	0.170
2048	0.000	0.00E+00	0.00E+00	0.000

^a Southern California Edison. 2024. 2023 Sustainability Report. <https://www.edison.com/sustainability/sustainability-report>; Based on SCE 2023 reported CO₂e intensity factor of 374 lbs/MWh subtracted by the CH₄ intensity factor of 0.033 lb/MWh and the N₂O intensity factor of 0.004 lb/MWh utilizing the IPCC Fifth Assessment Report global warming potentials of 28 and 265, respectively

^b The carbon intensity for Horizon Year 2048 considers the 100 percent RPS standard mandated under SB 100, which requires all the State's electricity to come from carbon-free resources by 2045.

GHG Emissions from Energy Use

Actual Energy Use - Year 2023	SCE	SWG
	MWH/YR	Therms
Residential - City	58,919	2,861,769
Non-Residential - City	74,134	1,927,933
Residential - SOI	20,889	1,014,624
Non-Residential - SOI	6,671	173,479
Transportation ¹	NA	275,650
CNG ²	NA	193,628
Other ³	NA	214,886
City Total	160,613	6,661,970

	MTCO ₂ e/Yr	
Commercial	NA	15,229
Industrial	NA	10,260
Residential	3,544	5,399
Non-Residential	1,132	NA
City Total	4,675	30,889

	Existing	Proposed Project
Electricity MWH		
Residential - City	58,919	100,687
Non-Residential - City	74,134	121,098
Residential - SOI	20,889	21,125
Non-Residential - SOI	6,671	5,987
Total	160,613	248,896
Electricity MTCO ₂ e		
Residential - City	9,995	0
Non-Residential - City	12,576	0
Residential - SOI	3,544	0
Non-Residential - SOI	1,132	0
Total MTCO ₂ e Electricity	27,247	0

	Existing	Proposed Project
Natural Gas Therms		
Residential - City	2,861,769	4,890,508
Non-Residential - City	1,927,933	3,149,295
Residential - SOI	1,014,624	1,026,047
Non-Residential - SOI	173,479	155,690
Transportation ¹	275,650	275,650
CNG ²	193,628	193,628
Other ³	214,886	214,886
Total	6,661,970	9,905,704

	Existing	Proposed Project
Natural Gas MTCO ₂ e		
Residential - City	15,229	26,026
Non-Residential - City	10,260	16,759
Residential - SOI	5,399	5,460
Non-Residential - SOI	923	829
Transportation ¹	1,467	1,467
CNG ²	1,030	1,030
Other ³	1,144	1,144
Total MTCO ₂ e Natural Gas	35,453	52,715

Notes:

¹ Customers that procure their own gas, and it is delivered to the customer on Southwest Gas' system

² Defined as 'Natural Gas for Motor Vehicles'

³ Defined as 'SML Electric Power Generation Gas Srvc * Electric Generation' & 'Military'

General Conversion Factors		
lbs to kg	0.4536	
kg to MTons	0.001	
Mmbtu to Therm	0.1	
Therms to kwh	29.30711111	
kilowatt hrs to megawatt hrs	0.001	
lbs to Tons	2000	
Tons to MTon	0.9071847	
lbs to Mtons	2204.6	

Source: California Air Resources Board (CARB). 2010. Local Government Operations Protocol. Version 1.1. Appendix F, Standard Conversion Factors

AR5	
CO ₂	1
CH ₄	28
N ₂ O	265

Source: Intergovernmental Panel on Climate Change (IPCC). 2013. Fifth Assessment Report: Climate Change 2013 - a Summary for Policy Makers.

City of Barstow General Plan: Criteria Air Pollutants from Natural Gas

Rate	lbs/MBTU					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Natural Gas						
Residential	0.00539216	0.09215686	0.03921569	0.00058824	0.00745098	0.00745098
Non-Residential	0.00539216	0.09803922	0.08235294	0.00058824	0.00745098	0.00745098
Source: CalEEMod Version 2022.1						

Natural Gas	2024					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
	Pounds Per Day					
Residential	6	98	42	1	8	8
Commercial/Industrial	3	56	47	0	4	4
Transportation ¹	0	7	6	0	1	1
CNG ²	0	5	4	0	0	0
Other ³	0	6	5	0	0	0
Total	10	173	104	1	14	14
	Tons Per Year					
Residential	1	18	8	0	1	1
Commercial/Industrial	1	10	9	0	1	1
Transportation ¹	0	1	1	0	0	0
CNG ²	0	1	1	0	0	0
Other ³	0	1	1	0	0	0
Total	2	32	19	0	2	2

Natural Gas	Project 2048					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
	Pounds Per Day					
Residential	9	149	64	1	12	12
Nonresidential	5	89	75	1	7	7
Transportation ¹	0	7	6	0	1	1
CNG ²	0	5	4	0	0	0
Other ³	0	6	5	0	0	0
Total	15	257	154	2	20	20
Increase from Baseline	5	84	49	1	7	7
	Tons Per Year					
Residential	2	27	12	0	2	2
Commercial/Industrial	1	16	14	0	1	1
Transportation ¹	0	1	1	0	0	0
CNG ²	0	1	1	0	0	0
Other ³	0	1	1	0	0	0
Total	3	47	28	0	4	4
Increase from Baseline	1	15	9	0	1	1

General Conversion Factors

Mmbtu to Therm	0.1
lbs to Tons	2000
Tons to MTon	0.9071847

Source: California Air Resources Board (CARB). 2010. Local Government Operations Protocol. Version 1.1. Appendix F, Standard Conversion Factors

5. Water/Wastewater Emissions Calculations

This page intentionally left blank.

City of Barstow General Plan Water and Wastewater

Water Demand for Barstow

			Wastewater	Existing ²	Proposed Project ²
Water		Existing ¹			
	Acre Feet Per Year	5,414	MGD	2.65	5.93
	MGY TOTAL	1,764	AFY	2,968	6,642
			MGY TOTAL	967	2,164

Notes:
¹ Water demand data provided by Mojave Water Agency.
² Wastewater generation data provided by City of Barstow.

Direct Emissions from Wastewater Treatment

Wastewater Treatment Type	BIOGENIC CO ₂ MT/Gallon	CH ₄ MT/Gallon	N ₂ O MT/Gallon	Non-Biogenic CO ₂ e MT/Gallon
Aerobic	3.90E-07	1.34E-09	8.52E-10	2.63E-07
Anaerobic (Facultative Lagoons)	3.90E-07	4.01E-07	8.52E-10	1.15E-05
Septic	0.00E+00	2.50E-07	8.52E-10	7.23E-06

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. <https://www.caleemod.com/user-guide>. Table G-35, Annual Wastewater Treatment Direct Emission Factors (short ton per gallon)

Aerobic	Existing	Proposed Project
Non-Biogenic CO ₂ e TOTAL=	255	570

Energy for Water Conveyance, Treatment, Distribution, and Wastewater Treatment

Location	Supply (Water Conveyance)	Water Treatment	Water Distribution	Total Water	Wastewater Treatment
kWhr/million gallons					
South Coast	3,044	725	1,537	5,306	1,501
San Francisco Bay	1,182	754	2,998	4,934	1,542
Central Coast	1,577	754	1,537	3,868	1,542
Tulare Lake	1,506	748	166	2,420	1,519
North Coast	620	754	1,537	2,911	1,542
San Joaquin River	827	748	166	1,741	1,519
Colorado River	2,304	748	166	3,218	1,519
Sacramento River	698	748	166	1,612	1,519
South Lahontan	1,953	748	1,537	4,238	1,519
North Lathontan	541	748	166	1,455	1,519

Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. <https://www.caleemod.com/user-guide>. Table G-32, Water Energy Intensity Factors by Hydrologic Region and Process (kWh per million gallon).

Intensity factor				CO ₂ e
	CO ₂ lbs/MWH	CH ₄ lbs/MWH	N ₂ O lbs/MWH	lbs/MWh
2023 ^a	372.016	0.033	0.004	374.0
2048 ^b	0.000	0.000	0.000	0.0
Intensity factor				CO ₂ e
	CO ₂ MTons/MWH	CH ₄ MTons/MWH	N ₂ O MTons/MWH	MTons/MWh
2023 ^a	0.169	1.50E-05	1.81E-06	0.170
2048 ^b	0.000	0.00E+00	0.00E+00	0.000

^a Southern California Edison. 2024. 2023 Sustainability Report. <https://www.edison.com/sustainability/sustainability-report>; Based on SCE 2023 reported CO₂e intensity factor of 374 lbs/MWh subtracted by the CH₄ intensity factor of 0.033 lb/MWh and the N₂O intensity factor of 0.004 lb/MWh utilizing the IPCC Fifth Assessment Report global warming potentials of 28 and 265, respectively
^b The carbon intensity for Horizon Year 2048 considers the 100 percent RPS standard mandated under SB 100, which requires all the State's electricity to come from carbon-free resources by 2045.

GHG Emissions from Energy Associated with Water/Wastewater

Energy Associated with Water Use	Existing Mwh	Proposed Project Mwh
TOTAL Water Use	7,477	10,713
TOTAL Wastewater Generation	1,469	3,288
Total Water/Wastewater	8,946	14,001

GHG Emissions from Energy Associated with Water Use/Wastewater Generation	Existing MTCO ₂ e	Proposed Project MTCO ₂ e
TOTAL Water Use	1,268	0
TOTAL Wastewater Generation	249	0
Total Water/Wastewater	1,518	0

Total GHG Emissions

GHG Emissions from Water/Wastewater Use	Existing MTCO ₂ e	Proposed Project MTCO ₂ e
TOTAL Water Use	1,268	0
TOTAL Wastewater Generation	504	570
Total Water/Wastewater	1,772	570

City of Barstow General Plan Water and Wastewater

General Conversion Factors

Global Warming Potentials (GWP)	AR5
CO ₂	1
CH ₄	28
N ₂ O	265

Source: Intergovernmental Panel on Climate Change (IPCC). 2013. Fifth Assessment Report: Climate Change 2013 - a Summary for Policy Makers.

Source: GHG Protocol. Global Warming Potentials Values. https://www.ghgprotocol.org/sites/default/files/ghgp/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf

gallons to Liters	3.785
killowatt hrs to megawatt hrs	0.001
gallons to AF	325851.4290
Tons to MTon	0.9071847

pounds to Metric Tons	2204.6 lbs per MT
kWh to Mmbtu	0.003412 Mmbtu per kWh
therms to Mbtu	0.1 Mmbtu per therm

6. Solid Waste Sector Emissions Calculations

This page intentionally left blank.

Solid Waste Disposal - City of Barstow + BIG

Source: CalRecycle Recycling and Disposal Reporting System Report (Overall Jurisdiction Tons For Disposal and Disposal Related Uses)

Waste Generated Within Barstow¹

Year	Annual (tons)
2020	29,007
2021	26,834
2022	29,875
2023	27,609
4-Year Average	28,331

Tons

City of Barstow Existing SP	38,427	persons
Waste Generation Rate/SP	0.7373	ton/SP
Percent of Disposal	2023	
Barstow Sanitary Landfill	86%	primary disposal facility

Service Population in Barstow

	Proposed GP		
	Existing	2048	% Increase
Service Population	38,427	62,716	
Annual Solid Waste	28,331	63,893	126%

Proposed Project Solid Waste Increase*

Category	Net Increase	Generation Rate	Tons Per Day	Per Year
		(lbs/unit/day)		(365 days)
Households	6,617	12.23	40.46	14,769
Employees	10,820	10.53	56.97	20,793
			Total	35,562

*See Table 5.17-21 of the DEIR.

Notes:

Source: CalRecycle. 2025, April 24 (accessed). RDRS Report 1: Overall Jurisdiction Tons for Disposal and Disposal Related Uses. <https://www2.calrecycle.ca.gov/RecyclingDisposalReporting/Reports/OverallJurisdictionTonsForDisposal>.

Landfill Emission Tool (version 1.9.2021) CH₄ Model Results.

	EXISTING			GENERAL PLAN
	MT CH ₄ in CO ₂ e	MTCO ₂ e w/LFG Capture	2023 Disposal (AR5 GWPs)* Total	
Year 1	77	19	26	58
Year 2	534	134	178	402
Year 3	600	150	200	451
Year 4	588	147	196	442
Year 5	576	144	192	433
Year 6	565	141	188	425
Year 7	554	138	185	416
Year 8	543	136	181	408
Year 9	532	133	177	400
Year 10	521	130	174	392
Year 11	511	128	170	384
Year 12	501	125	167	377
Year 13	491	123	164	369
Year 14	481	120	160	362
Year 15	472	118	157	355
Year 16	462	116	154	348
Year 17	453	113	151	341
Year 18	444	111	148	334
Year 19	435	109	145	327
Year 20	427	107	142	321
Year 21	418	105	139	315
Year 22	410	103	137	308
Year 23	402	100	134	302
Year 24	394	98	131	296
Year 25	386	97	129	290
Year 26	379	95	126	285
Year 27	371	93	124	279
Year 28	364	91	121	273
Year 29	357	89	119	268
Year 30	349	87	116	263
Year 31	343	86	114	257
Year 32	336	84	112	252
Year 33	329	82	110	247
Year 34	323	81	108	242
Year 35	316	79	105	238
Year 36	310	77	103	233
Year 37	304	76	101	228
Year 38	298	74	99	224
Year 39	292	73	97	219
Year 40	286	72	95	215
Year 41	280	70	93	211
Year 42	275	69	92	207
Year 43	269	67	90	203
Year 44	264	66	88	199
Year 45	259	65	86	195
Year 46	254	63	85	191
Year 47	249	62	83	187
Year 48	244	61	81	183
Year 49	239	60	80	180
Year 50	234	59	78	176
Year 51	230	57	77	173
Year 52	225	56	75	169
Year 53	221	55	74	166
Year 54	216	54	72	163
Year 55	212	53	71	159
Year 56	208	52	69	156
Year 57	204	51	68	153
Year 58	200	50	67	150
Year 59	196	49	65	147
Year 60	192	48	64	144
TOTAL	21,401	5,350	7,134	16,088

Waste. Landfill Emissions Tool Version 1.9.2021 and CalRecycle. Biogenic CO₂ emissions are not included.

Notes:

LFG capture Efficiency 0.75 AR5 CH₄ GWP 28 SAR GWP CH₄:* 21 Tons to metric Tons 0.9071847

Waste generation based on three year average waste commitment for Wildomar obtained from CalRecycle.

Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Consequently, the highest CH₄ emissions from waste disposal in a given year are reported. Decomposition based on the anaerobic decomposition factor (k) of 0.02 based on rainfall for the El Sobrante LF.

The Landfill Gas Estimator only includes the landfill gas (LFG) capture in the landfill gas heat output and therefore the reduction and emissions from landfill gas capture are calculated separately. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.3.

Biogenic CO₂ emissions are not included.

Solid Waste Disposal - SOI

Source: CalRecycle Recycling and Disposal Reporting System Report (Overall Jurisdiction Tons For Disposal and Disposal Related Uses)

Waste Generated Within SOI			Service Population in Barstow			
City Waste Generation Rate/SP SOI Service Population	0.7373 9,874	ton/SP persons	Proposed GP		2048	% Increase
			Existing	2048		
			9,874	9,979		
Annual Waste Generated	7,280	tons	Annual Solid Waste		7,280	7,357

Percent of Disposal	2023	
Barstow Sanitary Landfill	86%	primary disposal facility

Notes:
Source: CalRecycle. 2025, April 24 (accessed). RDRS Report 1: Overall Jurisdiction Tons for Disposal and Disposal Related Uses. <https://www2.calrecycle.ca.gov/RecyclingDisposalReporting/Reports/OverallJurisdictionTonsForDisposal>.

Landfill Emission Tool (version 1.9.2021) CH₄ Model Results.

	EXISTING				GENERAL PLAN
	CH ₄ Tons	MTCO ₂ e w/LFG Capture Existing TOTAL	2024		Horizon Year 2048 MTCO ₂ e
			Disposal (AR5		
			GWPs)* Total		
Year 1	20	5	7		7
Year 2	139	35	46		47
Year 3 (PEAK)	156	39	52		52
Year 4	152	38	51		51
Year 5	149	37	50		50
Year 6	146	37	49		49
Year 7	144	36	48		48
Year 8	141	35	47		47
Year 9	138	34	46		46
Year 10	135	34	45		46
Year 11	133	33	44		45
Year 12	130	32	43		44
Year 13	127	32	42		43
Year 14	125	31	42		42
Year 15	122	31	41		41
Year 16	120	30	40		40
Year 17	118	29	39		40
Year 18	115	29	38		39
Year 19	113	28	38		38
Year 20	111	28	37		37
Year 21	109	27	36		37
Year 22	106	27	35		36
Year 23	104	26	35		35
Year 24	102	26	34		34
Year 25	100	25	33		34
Year 26	98	25	33		33
Year 27	96	24	32		32
Year 28	94	24	31		32
Year 29	92	23	31		31
Year 30	91	23	30		31
Year 31	89	22	30		30
Year 32	87	22	29		29
Year 33	85	21	28		29
Year 34	84	21	28		28
Year 35	82	21	27		28
Year 36	80	20	27		27
Year 37	79	20	26		27
Year 38	77	19	26		26
Year 39	76	19	25		26
Year 40	74	19	25		25
Year 41	73	18	24		25
Year 42	71	18	24		24
Year 43	70	17	23		24
Year 44	68	17	23		23
Year 45	67	17	22		23
Year 46	66	16	22		22
Year 47	65	16	22		22
Year 48	63	16	21		21
Year 49	62	15	21		21
Year 50	61	15	20		20
Year 51	60	15	20		20
Year 52	58	15	19		20
Year 53	57	14	19		19
Year 54	56	14	19		19
Year 55	55	14	18		19
Year 56	54	13	18		18
Year 57	53	13	18		18
Year 58	52	13	17		17
Year 59	51	13	17		17
Year 60	50	12	17		17
TOTAL	5,550	1,388	1,850		1,870

Waste. Landfill Emissions Tool Version 1.9.2021 and CalRecycle. Biogenic CO₂ emissions are not included.

Notes:

LFG capture Efficiency	0.75	AR5 CH ₄ GWP	28	SAR GWP CH ₄ :#	21	Tons to metric Tons	0.9071847
------------------------	------	-------------------------	----	----------------------------	----	---------------------	-----------

Waste generation based on three year average waste commitment for Wildomar obtained from CalRecycle.

Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Consequently, the highest CH₄ emissions from waste disposal in a given year are reported.

Decomposition based on the anaerobic decomposition factor (k) of 0.02 based on rainfall for the El Sobrante LF.

The Landfill Gas Estimator only includes the landfill gas (LFG) capture in the landfill gas heat output and therefore the reduction and emissions from landfill gas capture are calculated separately. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.3.

Biogenic CO₂ emissions are not included.

7. Area Source: Off-Road Equipment Emissions Calculations

This page intentionally left blank.

City of Barstow General Plan Area Sources - Offroad Equipment Summary

Source: OFFROAD v.1.1.0, San Bernardino County, Year 2023. <https://arb.ca.gov/emfac/offroad/emissions-inventory/ac1904f619dde9381b90bd72b3a629ed18799ae4>

OFFROAD Estimate based on:

Construction Equipment	Based on the percentage of housing permits in Barstow compared to the San Bernardino County (HUD 2024)
Light Commercial and Industrial Equipment	Based on the percentage of employment in Barstow compared to San Bernardino County (US Census 2024)
Lawn & Garden	Based on the percentage of housing units in Barstow compared to San Bernardino County (US Census 2024)
Agricultural Equipment	Based on the percentage of agricultural acreage within the General Plan Area compared to the County of San Bernardino (DOC 2024).

Sources

Construction (Housing Permits)

Source: Housing and Urban Development (HUD). 2024, Accessed June 11, 2024. SOCDS Building Permits Database.
<https://socds.huduser.gov/permits/>

Housing Units

Source: U.S. Census Bureau. American Community Survey, Data Profiles, Accessed June 12, 2024. <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>

Employment

Source: U.S. Census Bureau. LED Extraction Tool, Accessed June 12, 2024. <http://lehd.ces.census.gov/>

Agricultural

Source: California Department of Conservation (DOC). Accessed June 13, 2024. San Bernardino County Important Farmland Data Availability.
<https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanBernardino.aspx>

Existing	ROG Exhaust	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM ₁₀ Exhaust	PM _{2.5} Exhaust*	CO2
Pounds Per Day							
Agricultural	22	97	299	0	6	5	
Construction Equipment	0	1	2	0	0	0	
Lawn & Garden	77	10	857	0	1	1	
Light Commercial / Industrial Equipment	41	50	1,872	0	1	1	
TOTAL	141	158	3,030	0	8	7	0
Tons Per Year							
Agricultural	4	18	54	0	1	1	2,372
Construction Equipment	0	0	0	0	0	0	34
Lawn & Garden	14	2	156	0	0	0	482
Light Commercial / Industrial Equipment	8	9	342	0	0	0	1,845
TOTAL	26	29	553	0	1	1	4,732

Proposed General Plan		ROG Exhaust	NO _x Exhaust	CO Exhaust	SO2 Exhaust	PM10 Exhaust	PM2.5 Exhaust*	CO2
Forecast Adjusted for:		Pounds Per Day						MT/yr
Agricultural	Based on a reduction in Agricultural land in the City	0.13	0.57	1.77	0.00	0.04	0.03	0
Construction Equipment	Proportional to housing growth	0.29	1.65	3.63	0.00	0.11	0.10	0
Lawn & Garden	Proportional to housing growth	118.37	14.79	1,309.66	0.07	1.32	1.00	0
Light Commercial / Industrial Equipment	Proportional to employment growth	57.19	69.54	2,595.36	0.14	1.48	0.93	0
TOTAL		176	87	3,910	0	3	2	0
Forecast Adjusted for:		Tons Per Year						
Agricultural	Based on a reduction in Agricultural land in the City	0.02	0.10	0.32	0.00	0.01	0.01	14
Construction Equipment	Proportional to housing growth	0.05	0.30	0.66	0.00	0.02	0.02	52
Lawn & Garden	Proportional to housing growth	21.60	2.70	239.01	0.01	0.24	0.18	736
Light Commercial / Industrial Equipment	Proportional to employment growth	10.44	12.69	473.65	0.03	0.27	0.17	2,558
TOTAL		32	16	714	0	1	0	3,360

Housing Growth Rate (All):	1.53
Employment Growth Rate (City+SOI):	1.39

Agricultural Land with the Study Area			
Year	2023	2048	% Change
Acres	1,970	12	-99%

San Bernardino County OFFROAD

Source: OFFROAD v.1.1.0, San Bernardino County, Year 2023. <https://arb.ca.gov/emfac/offroad/emissions-inventory/ac1904f619dde9381b90bd72b3a629ed18799ae4>

Model Output: Off-Road Web Query (v1.1.0) Emissions Inventory
Region Type: County
Region: San Bernardino
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: Off-Road Web Query Equipment Types
Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Agriculture														
Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
San Bernardinc	2023	Agricultural - Agricultural Tractors	Aggregate	Aggregate	Gasoline	96.03928491	2.07E-05	1.75E-05	0.000251	2.65E-08	4.53E-07	4.17E-07	0.002963	9.81E-01
San Bernardinc	2023	Agricultural - Agricultural Tractors	Aggregate	Aggregate	Diesel	1893152.366	0.063533	0.384902	0.328811	0.000531	0.023282	0.021419	58.2029	1.93E+04
San Bernardinc	2023	Agricultural - ATVs	Aggregate	Aggregate	Gasoline	53210.41102	0.011822	0.006285	0.137427	1.47E-05	0.000432	0.000397	1.641842	5.44E+02
San Bernardinc	2023	Agricultural - ATVs	Aggregate	Aggregate	Diesel	25214.63819	0.000771	0.004771	0.005264	7.07E-06	0.000194	0.000179	0.775196	2.57E+02
San Bernardinc	2023	Agricultural - ATVs	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardinc	2023	Agricultural - Bale Wagons (Self Propelled)	Aggregate	Aggregate	Diesel	2366.886045	6.19E-05	0.000537	0.000424	6.64E-07	2.58E-05	2.37E-05	0.072767	2.41E+01
San Bernardinc	2023	Agricultural - Balers (Self Propelled)	Aggregate	Aggregate	Diesel	58.95718735	1.96E-06	1.47E-05	1.14E-05	1.65E-08	7.72E-07	7.11E-07	0.001813	6.00E-01
San Bernardinc	2023	Agricultural - Combine Harvesters	Aggregate	Aggregate	Diesel	56412.72897	0.001084	0.009291	0.006621	1.58E-05	4.13E-04	3.80E-04	1.734348	5.74E+02
San Bernardinc	2023	Agricultural - Construction Equipment	Aggregate	Aggregate	Diesel	31113.14603	0.000769	0.006765	0.005362	8.73E-06	3.27E-04	3.00E-04	0.95654	3.17E+02
San Bernardinc	2023	Agricultural - Cotton Pickers	Aggregate	Aggregate	Diesel	541.5987216	9.88E-06	8.95E-05	6.71E-05	1.52E-07	3.72E-06	3.42E-06	0.016651	5.51E+00
San Bernardinc	2023	Agricultural - Forage & Silage Harvesters	Aggregate	Aggregate	Diesel	43242.76015	0.000835	0.007288	0.006075	1.21E-05	3.15E-04	2.90E-04	1.329451	4.40E+02
San Bernardinc	2023	Agricultural - Forklifts	Aggregate	Aggregate	Diesel	28776.18747	0.001054	0.006697	0.005829	8.07E-06	3.96E-04	3.64E-04	0.884692	2.93E+02
San Bernardinc	2023	Agricultural - Hay Squeeze/Stack retriever	Aggregate	Aggregate	Diesel	9526.713727	0.000219	0.001804	0.001544	2.67E-06	8.67E-05	7.98E-05	0.292888	9.70E+01
San Bernardinc	2023	Agricultural - Misc - 2-Wheel Tractors	Aggregate	Aggregate	Gasoline	2480	0.00133	0.000911	0.039354	6.37E-07	4.32E-04	3.27E-04	1.58E-05	5.24E-03
San Bernardinc	2023	Agricultural - Misc - Hydro Power Units	Aggregate	Aggregate	Gasoline	1758.6	0.000923	0.000634	0.027968	4.48E-07	3.37E-04	2.54E-04	1.1E-05	3.66E-03
San Bernardinc	2023	Agricultural - Misc - Hydro Power Units	Aggregate	Aggregate	Diesel	7.537	2.34E-05	0.000147	8.93E-05	2.20E-09	5.01E-06	3.78E-06	3.44E-06	1.14E-03
San Bernardinc	2023	Agricultural - Misc - Mowers	Aggregate	Aggregate	Gasoline	2158.8	0.001185	8.15E-04	3.42E-02	5.53E-07	4.34E-04	3.27E-04	1.34E-05	4.43E-03
San Bernardinc	2023	Agricultural - Misc - Other	Aggregate	Aggregate	Gasoline	126.2	6.91E-05	4.42E-05	0.002	3.25E-08	1.94E-05	1.47E-05	7.9E-07	2.62E-04
San Bernardinc	2023	Agricultural - Misc - Other	Aggregate	Aggregate	Diesel	8.147	2.53E-05	0.00016	9.65E-05	2.38E-09	5.44E-06	4.11E-06	3.73E-06	1.23E-03
San Bernardinc	2023	Agricultural - Misc - Sprayers	Aggregate	Aggregate	Gasoline	4037	0.002379	1.32E-03	6.37E-02	1.05E-06	6.30E-04	4.77E-04	2.42E-05	8.02E-03
San Bernardinc	2023	Agricultural - Misc - Sprayers	Aggregate	Aggregate	Diesel	2.577	8.69E-06	5.34E-05	2.88E-05	7.52E-10	1.99E-06	1.5E-06	1.21E-06	3.99E-04
San Bernardinc	2023	Agricultural - Misc - Tillers	Aggregate	Aggregate	Gasoline	48900	0.0179	0.009974	0.795839	1.28E-05	6.29E-05	4.74E-05	0.000311	1.03E-01
San Bernardinc	2023	Agricultural - Misc - Tillers	Aggregate	Aggregate	Diesel	0.1068	2.49E-07	1.75E-06	1.47E-06	3.12E-11	6.16E-08	4.65E-08	4.23E-08	1.40E-05
San Bernardinc	2023	Agricultural - Nut Harvester	Aggregate	Aggregate	Diesel	47820.33341	0.00173	0.010975	0.009283	1.34E-05	0.000678	0.000624	1.470184	4.87E+02
San Bernardinc	2023	Agricultural - Other Harvesters	Aggregate	Aggregate	Diesel	34880.59296	0.000867	0.006927	0.005187	9.79E-06	0.000364	0.000335	1.072366	3.55E+02
San Bernardinc	2023	Agricultural - Sprayers/Spray rigs	Aggregate	Aggregate	Diesel	76852.56005	0.002458	0.018203	0.013704	2.16E-05	0.001049	0.000965	2.362748	7.82E+02
San Bernardinc	2023	Agricultural - Swathers/Windrowers/Hay Conditioners	Aggregate	Aggregate	Diesel	26493.37239	0.00067	0.004968	0.003514	7.43E-06	0.000284	0.000262	0.81451	2.70E+02
TOTAL AGRICULTURAL OFFROAD						2389238.26	0.11	0.48	1.49	0.00	0.03	0.03	71.63	2.37E+04
ESTIMATED Barstow						238908.06	0.01	0.05	0.15	0.00	0.00	0.00	7.16	
ESTIMATED Barstow (lbs/day)						47781.6125.2	22	97	298.523	0.1	6.0	5	14326	
ESTIMATED Barstow (tons/year)							4.01	17.65	54.48	0.02	1.09	0.99		2,371.75

FARMLAND: https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanBernardino.aspx .		Existing
Farmland in San Bernardino County		19,704
Farmland in Barstow		1,970
Percent in the City		10.00%

San Bernardino County OFFROAD

Source: OFFROAD v.1.1.0, San Bernardino County, Year 2023. <https://arb.ca.gov/emfac/offroad/emissions-inventory/ac1904f619dde9381b90bd72b3a629ed18799ae4>

Model Output: Off-Road Web Query (v1.1.0) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2023

Scenario: All Adopted Rules - Exhaust

Vehicle Classification: Off-Road Web Query Equipment Types

Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Construction and Mining

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
San Bernardinc	2023	Construction and Mining - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	409028.0382	0.009468	0.0707	0.048555	1.19E-04	0.003792	0.003489	12.58735	4.17E+03
San Bernardinc	2023	Construction and Mining - Bucket	Aggregate	Aggregate	Diesel	9808.328396	0.000155	0.00096	0.001089	2.86E-06	5.41E-05	4.98E-05	0.30184	9.99E+01
San Bernardinc	2023	Construction and Mining - Compactor	Aggregate	Aggregate	Diesel	15905.26813	0.000201	0.00142	0.00202	4.64E-06	5.88E-05	5.41E-05	0.489466	1.62E+02
San Bernardinc	2023	Construction and Mining - Concrete Mixer	Aggregate	Aggregate	Diesel	1468.137335	1.79E-05	0.000147	0.000173	4.28E-07	4.9E-06	4.51E-06	0.04518	1.50E+01
San Bernardinc	2023	Construction and Mining - Concrete Pump	Aggregate	Aggregate	Diesel	14701.35349	0.000245	0.001883	0.001816	4.29E-06	7.61E-05	7E-05	0.452417	1.50E+02
San Bernardinc	2023	Construction and Mining - Crane less than 35ton	Aggregate	Aggregate	Diesel	7169.151867	0.000147	0.001314	0.001239	2.09E-06	7.18E-05	6.6E-05	0.220622	7.31E+01
San Bernardinc	2023	Construction and Mining - Cranes	Aggregate	Aggregate	Diesel	352196.6992	0.00695	0.059511	0.040136	1.03E-04	3.32E-03	3.06E-03	10.83843	3.59E+03
San Bernardinc	2023	Construction and Mining - Crawler Tractors	Aggregate	Aggregate	Diesel	1053354.244	2.38E-02	0.182156	0.13538	3.07E-04	1.06E-02	9.71E-03	3.24E+01	1.07E+04
San Bernardinc	2023	Construction and Mining - Crushing/Processing Equipment	Aggregate	Aggregate	Diesel	57906.44292	0.000512	0.00304	0.005109	1.69E-05	0.00013	0.00012	1.78E+00	5.90E+02
San Bernardinc	2023	Construction and Mining - Excavators	Aggregate	Aggregate	Diesel	3374059.181	5.75E-02	0.404469	0.409459	9.84E-04	1.92E-02	1.77E-02	1.04E+02	3.44E+04
San Bernardinc	2023	Construction and Mining - Graders	Aggregate	Aggregate	Diesel	478477.373	0.010641	0.08334	0.048461	1.39E-04	0.004852	0.004463	14.72457	4.88E+03
San Bernardinc	2023	Construction and Mining - Hopper Tractor Trailer	Aggregate	Aggregate	Diesel	978.5182099	7.97E-06	2.87E-05	5.94E-05	2.85E-07	1.57E-06	1.44E-06	0.030113	9.97E+00
San Bernardinc	2023	Construction and Mining - Misc - Asphalt Pavers	Aggregate	Aggregate	Gasoline	9213.2	1.51E-03	0.001277	0.056913	2.32E-06	5.55E-04	4.19E-04	0.149505	4.95E+01
San Bernardinc	2023	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Gasoline	5957.88	4.14E-04	5.41E-04	0.015664	1.49E-06	1.57E-04	1.19E-04	1.32E-01	4.38E+01
San Bernardinc	2023	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	37.72	0.000121	0.000767	0.000446	1.10E-08	2.59E-05	1.96E-05	1.78E-06	5.88E-04
San Bernardinc	2023	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Gasoline	35227	1.93E-02	1.20E-02	0.559585	9.18E-06	5.34E-03	4.04E-03	2.22E-05	7.35E-03
San Bernardinc	2023	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Diesel	55.42	1.49E-04	0.000936	0.000727	1.62E-08	3.3E-05	2.49E-05	2.23E-06	7.39E-04
San Bernardinc	2023	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Gasoline	44579.9	1.54E-02	0.011195	0.498558	1.15E-05	6.06E-03	4.59E-03	0.353023	1.17E+02
San Bernardinc	2023	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Diesel	2163.34	7.79E-05	0.000566	0.000568	8.37E-07	1.98E-05	1.75E-05	6.63E-02	2.20E+01
San Bernardinc	2023	Construction and Mining - Misc - Cranes	Aggregate	Aggregate	Gasoline	4912.9	1.39E-04	3.53E-04	0.007518	1.19E-06	8.19E-06	6.19E-06	1.18E-01	3.89E+01
San Bernardinc	2023	Construction and Mining - Misc - Crushing/Proc. Equipment	Aggregate	Aggregate	Gasoline	224.14	0.000106	7.37E-05	0.003594	5.71E-08	4.58E-05	3.46E-05	1.41E-07	4.68E-05
San Bernardinc	2023	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Gasoline	3631.25	2.03E-03	0.001365	5.29E-02	9.40E-07	5.93E-04	4.47E-04	7.65E-03	2.53E+00
San Bernardinc	2023	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Diesel	4.463	1.5E-05	9.49E-05	5.13E-05	1.31E-09	3.19E-06	2.42E-06	2.19E-07	7.26E-05
San Bernardinc	2023	Construction and Mining - Misc - Excavators	Aggregate	Aggregate	Diesel	31.93	1.07E-04	0.000679	0.000366	9.31E-09	2.28E-05	1.73E-05	1.57E-06	5.19E-04
San Bernardinc	2023	Construction and Mining - Misc - Other	Aggregate	Aggregate	Gasoline	7511.7	6.59E-05	0.000241	0.00606	1.87E-06	1.35E-05	1.02E-05	0.188743	6.25E+01
San Bernardinc	2023	Construction and Mining - Misc - Other	Aggregate	Aggregate	Diesel	118.44	0.000317	0.001982	0.001559	3.46E-08	6.94E-05	5.24E-05	4.76E-06	1.58E-03
San Bernardinc	2023	Construction and Mining - Misc - Pavers	Aggregate	Aggregate	Diesel	8.41	2.83E-05	0.000179	9.67E-05	2.45E-09	6.05E-06	4.57E-06	4.13E-07	1.37E-04
San Bernardinc	2023	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Gasoline	65708.9	0.032776	0.022644	0.960647	1.69E-05	1.05E-02	7.93E-03	0.13475	4.46E+01
San Bernardinc	2023	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Diesel	14.29	4.8E-05	3.03E-04	1.64E-04	4.17E-09	1.02E-05	7.71E-06	7.00E-07	2.32E-04
San Bernardinc	2023	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Gasoline	23897.6	0.01362	8.78E-03	0.377749	6.17E-06	3.56E-03	2.69E-03	1.52E-05	5.02E-03
San Bernardinc	2023	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Diesel	39.82	0.000102	0.000639	0.000535	1.16E-08	2.24E-05	1.7E-05	1.54E-06	5.10E-04
San Bernardinc	2023	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Gasoline	31174.5	0.007053	0.005824	0.241681	7.60E-06	0.002541	0.00192	0.424401	1.41E+02
San Bernardinc	2023	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Diesel	244.2	0.000706	0.004439	0.003084	7.13E-08	0.000153	0.000116	1.05E-05	3.48E-03
San Bernardinc	2023	Construction and Mining - Misc - Rough Terrain Forklifts	Aggregate	Aggregate	Gasoline	34682.3	0.000873	0.002529	0.040435	8.31E-06	5.94E-05	4.49E-05	8.51E-01	2.82E+02
San Bernardinc	2023	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Gasoline	18374.1	0.000497	0.001296	0.026229	4.36E-06	3.08E-05	2.33E-05	4.43E-01	1.47E+02
San Bernardinc	2023	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	5.61	1.89E-05	0.000119	6.45E-05	1.64E-09	4.01E-06	3.03E-06	2.75E-07	9.11E-05
San Bernardinc	2023	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Gasoline	676.82	0.000328	0.000242	0.010831	1.73E-07	0.000137	0.000103	4.39E-07	1.45E-04
San Bernardinc	2023	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Diesel	1579.3	0.001616	0.010179	0.008585	5.51E-07	0.000358	0.000271	2.94E-02	9.74E+00
San Bernardinc	2023	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Gasoline	67918.15	0.010593	0.008177	0.349516	1.76E-05	0.003664	0.002767	1.22E+00	4.02E+02
San Bernardinc	2023	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1652	0.00557	0.03525	0.01898	4.82E-07	0.001209	0.000914	8.10E-05	2.68E-02
San Bernardinc	2023	Construction and Mining - Misc - Surfacing Equipment	Aggregate	Aggregate	Gasoline	29048.6	0.017829	0.012841	0.455974	7.43E-06	0.005531	0.00419	1.84E-05	6.10E-03
San Bernardinc	2023	Construction and Mining - Misc - Tampers/Rammers	Aggregate	Aggregate	Gasoline	4030.6	0.00169	0.001307	0.06503	1.05E-06	0.000928	0.0007	2.86E-06	9.46E-04
San Bernardinc	2023	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Gasoline	11807.75	0.000213	0.000608	0.0161	2.76E-06	1.99E-05	1.51E-05	2.86E-01	9.47E+01
San Bernardinc	2023	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	152.8	0.000513	0.003242	0.001751	4.45E-08	0.000109	8.23E-05	7.48E-06	2.48E-03
San Bernardinc	2023	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Gasoline	57129.65	0.012554	0.010189	0.442302	1.44E-05	0.004644	0.003509	7.79E-01	2.58E+02
San Bernardinc	2023	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Diesel	205.2	0.000646	0.004073	0.002471	5.99E-08	0.000138	0.000105	9.51E-06	3.15E-03
San Bernardinc	2023	Construction and Mining - Nurse Rig Other	Aggregate	Aggregate	Diesel	86.90443286	2.25E-06	1.51E-05	1.8E-05	2.53E-08	1.45E-06	1.33E-06	2.67E-03	8.86E-01
San Bernardinc	2023	Construction and Mining - Off-Highway Tractors	Aggregate	Aggregate	Diesel	602342.8458	0.014567	0.082305	0.087823	1.76E-04	0.005032	0.004629	1.85E+01	6.14E+03
San Bernardinc	2023	Construction and Mining - Off-Highway Trucks	Aggregate	Aggregate	Diesel	1434863.647	0.026964	0.208831	0.126914	4.18E-04	0.00971	0.008934	4.42E+01	1.46E+04
San Bernardinc	2023	Construction and Mining - Other Construction Equipment	Aggregate	Aggregate	Diesel	683983.6466	0.01401	0.109897	0.083659	1.99E-04	0.005897	0.005425	2.10E+01	6.97E+03
San Bernardinc	2023	Construction and Mining - Other Material Handling Equipment	Aggregate	Aggregate	Diesel	212955.4334	0.003783	0.028704	0.02315	6.21E-05	0.001498	0.001378	6.55E+00	2.17E+03
San Bernardinc	2023	Construction and Mining - Pavers	Aggregate	Aggregate	Diesel	215881.7927	0.004445	0.030404	0.028247	6.29E-05	0.001649	0.001517	6.64E+00	2.20E+03
San Bernardinc	2023	Construction and Mining - Paving Equipment	Aggregate	Aggregate	Diesel	239895.3225	0.003874	0.025535	0.028897	6.99E-05	0.001371	0.001261	7.38E+00	2.44E+03
San Bernardinc	2023	Construction and Mining - Rollers	Aggregate	Aggregate	Diesel	564465.9318	0.014956	0.092377	0.10682	1.65E-04	5.44E-03	5.01E-03	17.37076	5.75E+03
San Bernardinc	2023	Construction and Mining - Rough Terrain Forklifts	Aggregate	Aggregate	Diesel	707185.3078	0.010829	0.087352	0.128712	2.06E-04	3.97E-03	3.66E-03	2.18E+01	7.21E+03
San Bernardinc	2023	Construction and Mining - Rubber Tired Dozers	Aggregate	Aggregate	Diesel	128652.7304	0.004529	0.035302	0.028682	3.75E-05	0.002234	0.002055	3.959133	1.31E+03
San Bernardinc	2023	Construction and Mining - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	2454611.178	0.04794	0.33054	0.272785	7.16E-04	1.81E-02	1.67E-02	7.55E+01	2.50E+04

San Bernardino County OFFROAD

Source: OFFROAD v.1.1.0, San Bernardino County, Year 2023. <https://arb.ca.gov/emfac/offroad/emissions-inventory/ac1904f619dde9381b90bd72b3a629ed18799ae4>

Model Output: Off-Road Web Query (v1.1.0) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2023

Scenario: All Adopted Rules - Exhaust

Vehicle Classification: Off-Road Web Query Equipment Types

Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

San Bernardino	2023 Construction and Mining - Scrapers	Aggregate	Aggregate	Diesel	1281186.959	0.04463	0.379182	0.288899	3.73E-04	0.022966	0.021129	39.42699	1.31E+04
San Bernardino	2023 Construction and Mining - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1166638.535	0.023984	0.191353	0.219	0.00034	0.008539	0.007855	35.9019	1.19E+04
San Bernardino	2023 Construction and Mining - Spray Truck	Aggregate	Aggregate	Diesel	14067.15386	0.000298	0.002013	0.002088	4.10E-06	0.000122	0.000112	0.4329	1.43E+02
San Bernardino	2023 Construction and Mining - Spreader Tractor Trailer	Aggregate	Aggregate	Diesel	1761.197706	3.26E-05	0.000254	0.000127	5.13E-07	9.92E-06	9.12E-06	0.054199	1.79E+01
San Bernardino	2023 Construction and Mining - Spreader Truck	Aggregate	Aggregate	Diesel	11113.53334	0.000171	0.000997	0.001191	3.24E-06	6.18E-05	5.69E-05	0.342006	1.13E+02
San Bernardino	2023 Construction and Mining - Surfacing Equipment	Aggregate	Aggregate	Diesel	114106.9201	0.002064	0.014905	0.011157	3.33E-05	0.00079	0.000727	3.511504	1.16E+03
San Bernardino	2023 Construction and Mining - Tank Truck	Aggregate	Aggregate	Diesel	24456.6566	0.000374	0.002203	0.001701	7.13E-06	0.000108	9.97E-05	0.752624	2.49E+02
San Bernardino	2023 Construction and Mining - Tanker Truck Trailer	Aggregate	Aggregate	Diesel	1882.416817	2.75E-05	0.000147	0.000262	5.49E-07	7.31E-06	6.73E-06	0.057929	1.92E+01
San Bernardino	2023 Construction and Mining - Telescopic Handler	Aggregate	Aggregate	Diesel	49132.39898	0.000483	0.004986	0.008138	1.43E-05	0.000155	0.000142	1.511991	5.01E+02
San Bernardino	2023 Construction and Mining - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	3262152.072	0.076959	0.508506	0.551418	0.000951	0.031785	0.029243	100.3888	3.32E+04
San Bernardino	2023 Construction and Mining - Trenchers	Aggregate	Aggregate	Diesel	112445.9798	0.003756	0.02366	0.018527	3.28E-05	0.001451	0.001335	3.46039	1.15E+03
San Bernardino	2023 Construction and Mining - Vacuum Truck	Aggregate	Aggregate	Diesel	36534.31397	0.000739	0.005171	0.003977	1.07E-05	2.60E-04	2.39E-04	1.1243	3.72E+02
San Bernardino	2023 Construction and Mining - Water Truck	Aggregate	Aggregate	Diesel	108515.5568	0.002286	0.016592	0.00981	3.16E-05	0.000902	0.00083	3.339436	1.11E+03

TOTAL CONSTRUCTION OFFROAD	1.97E+07	5.58E-01	3.16E+00	6.95E+00	5.72E-03	2.11E-01	1.86E-01	5.96E+02	1.97E+05
ESTIMATED Barstow (g/yr; tpd; MTY)	3,361	9.54E-05	5.39E-04	1.19E-03	9.77E-07	3.60E-05	3.18E-05	1.02E-01	
ESTIMATED Barstow (lbs/day)		0.19	1.08	2.38	0.00	0.07	0.06		
ESTIMATED Barstow (tons/year)		0.03	0.20	0.43	0.00	0.01	0.01		33.73

TOTAL HOUSING PERMITS: https://socds.huduser.gov/permits/						
	2019	2020	2021	2022	2023	Average
San Bernardino County	5,577	5,607	5,129	6,342	6,463	7,315
Barstow	1	0	1	3	3	1
Percent in the City	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Lawn and Garden

Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
San Bernardino	2023	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Gasoline	392231.45	0.432493	0.014399	1.286213	9.91E-05	0.005413	0.004089	6.845549	2.27E+03
San Bernardino	2023	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Gasoline	232251.8357	0.39172	0.013907	0.692517	5.85E-05	0.002915	0.0022	3.686068	1.22E+03
San Bernardino	2023	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Gasoline	4252.502851	0.000606	0.000217	0.027852	1.08E-06	1.33E-06	1.00E-06	0.065264	2.16E+01
San Bernardino	2023	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Diesel	239.7070429	8.77E-06	5.54E-05	2.99E-05	6.94E-08	1.87E-06	1.41E-06	0.00727	2.41E+00
San Bernardino	2023	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Gasoline	926505.7997	0.117635	0.071118	5.447947	0.000247	0.001623	0.001227	15.5495	5.15E+03
San Bernardino	2023	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Gasoline	1000635.937	0.724718	0.025309	3.58132	0.000253	0.010655	0.008047	18.49284	6.12E+03
San Bernardino	2023	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Gasoline	20644.9357	0.002316	0.00096	0.13056	5.22E-06	7.3E-06	5.51E-06	0.32643	1.08E+02
San Bernardino	2023	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Diesel	120.6724417	3.85E-06	2.66E-05	2.12E-05	3.47E-08	9.30E-07	7.03E-07	0.00363	1.20E+00
San Bernardino	2023	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Gasoline	1586327.684	0.206651	0.107727	11.13965	0.000404	0.000991	0.000748	24.1608	8.00E+03
San Bernardino	2023	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Diesel	96884.22039	0.003384	0.021983	0.013639	2.79E-05	0.000748	0.000565	2.918175	9.66E+02
San Bernardino	2023	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Gasoline	1821.625976	0.000202	9.75E-05	0.013217	4.78E-07	6.20E-07	4.69E-07	0.025629	8.49E+00
San Bernardino	2023	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Gasoline	18918.7216	0.00582	0.000912	0.105311	4.96E-06	1.22E-05	9.25E-06	0.309432	1.02E+02
San Bernardino	2023	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Gasoline	745057.8762	0.460048	0.028061	2.72335	1.89E-04	0.004027	0.003047	13.93813	4.62E+03
San Bernardino	2023	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2023	Lawn and Garden - Misc - Wood Splitters	Aggregate	Aggregate	Gasoline	169331.2761	0.023482	0.011222	1.051057	4.29E-05	1.17E-04	8.80E-05	2.704971	8.96E+02
TOTAL LAWN & GARDEN						5.20E+06	2.37E+00	2.96E-01	2.62E+01	1.33E-03	2.65E-02	2.00E-02	8.90E+01	2.95E+04
ESTIMATED Barstow						84,940	0	0	0	0	0	0	1	
ESTIMATED Barstow (lbs/day)							77	10	857	0	1	1	2,911	
ESTIMATED Barstow (tons/year)							14.14	1.77	156.43	0.01	0.16	0.12		482.01

HOUSING UNITS https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/		Existing
Housing Units in San Bernardino County (2022)		733,104
Housing Units in Barstow		11,986
Percent in the City		1.6%

San Bernardino County OFFROAD

Source: OFFROAD v.1.1.0, San Bernardino County, Year 2023. <https://arb.ca.gov/emfac/offroad/emissions-inventory/ac1904f619dde9381b90bd72b3a629ed18799ae4>

Model Output: Off-Road Web Query (v1.1.0) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2023

Scenario: All Adopted Rules - Exhaust

Vehicle Classification: Off-Road Web Query Equipment Types

Units: tons/day for Emissions, gallons/year for Fuel, hours/year for Activity, Horsepower-hours/year for Horsepower-hours

Light Commercial and Industrial														
Region	Calendar Year	Vehicle Category	Model Year	Horsepower Bin	Fuel	Fuel Consumption (g/yr)	ROG_tpd	NOx_tpd	CO_tpd	SOx_tpd	PM10_tpd	PM2.5_tpd	CO2_tpd	CO2e_MTY
San Bernardinc	2023	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Gasoline	1494684.044	0.167948	0.104383	10.01309	0.00038	0.000658	0.000497	23.70233	7.85E+03
San Bernardinc	2023	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Diesel	39094.91903	0.001278	0.008178	0.009571	1.47E-05	0.000313	0.000282	1.200923	3.98E+02
San Bernardinc	2023	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardinc	2023	Light Commercial - Misc - Gas Compressors	Aggregate	Aggregate	Nat Gas	479522.4	0	0.027349	0.320287	0	0	0	8.732926	2.89E+03
San Bernardinc	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Gasoline	2476623.179	0.532935	0.199554	15.0556	0.000643	0.001626	0.001229	40.80717	1.35E+04
San Bernardinc	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Diesel	198513.7721	0.005751	0.042606	0.03518	6.73E-05	0.001535	0.001261	6.075672	2.01E+03
San Bernardinc	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardinc	2023	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Nat Gas	15417.6	0	0.000899	0.007987	0	0	0	0.284842	9.43E+01
San Bernardinc	2023	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Gasoline	1061206.557	0.129666	0.057844	7.446811	0.000271	0.000291	0.00022	16.30183	5.40E+03
San Bernardinc	2023	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Diesel	1022.442111	2.67E-05	0.000219	0.000179	3.47E-07	7.6E-06	6.13E-06	0.031265	1.04E+01
San Bernardinc	2023	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardinc	2023	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Gasoline	320055.4996	0.033896	0.017189	1.508021	8.18E-05	0.000261	0.000197	6.052593	2.00E+03
San Bernardinc	2023	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Diesel	108971.0527	0.003356	0.023347	0.020383	3.72E-05	0.000858	0.000711	3.335062	1.10E+03
San Bernardinc	2023	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardinc	2023	Light Commercial - Misc - Welders	Aggregate	Aggregate	Gasoline	657488.2787	0.078493	0.040652	4.264593	0.000168	0.000477	0.00036	10.60605	3.51E+03
San Bernardinc	2023	Light Commercial - Misc - Welders	Aggregate	Aggregate	Diesel	207576.3738	0.006563	0.04353	0.045762	7.59E-05	0.00165	0.00145	6.369103	2.11E+03
San Bernardinc	2023	Light Commercial - Misc - Welders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardinc	2023	Industrial - Aerial Lifts	Aggregate	Aggregate	Diesel	97232.82958	0.001442	0.015457	0.01753	2.83E-05	0.000539	0.000496	2.992224	9.91E+02
San Bernardinc	2023	Industrial - Boom	Aggregate	Aggregate	Diesel	97387.09848	0.001398	0.01533	0.018027	2.84E-05	0.000371	0.000341	2.996971	9.92E+02
San Bernardinc	2023	Industrial - Forklifts	Aggregate	Aggregate	Diesel	430182.0239	0.008527	0.064466	0.078433	0.000125	0.003329	0.003062	13.23834	4.38E+03
San Bernardinc	2023	Industrial - Garbage Refuse	Aggregate	Aggregate	Diesel	4678.447437	5.15E-05	0.000338	0.0003	1.36E-06	1.32E-05	1.21E-05	0.143974	4.77E+01
San Bernardinc	2023	Industrial - Garbage Transfer	Aggregate	Aggregate	Diesel	853.2719788	8.63E-06	4.51E-05	5.29E-05	2.49E-07	2.08E-06	1.91E-06	0.026258	8.69E+00
San Bernardinc	2023	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Gasoline	57859.07	0.004736	0.004418	0.166896	1.48E-05	0.001348	0.001019	1.252902	4.15E+02
San Bernardinc	2023	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Diesel	90.1	0.000273	0.001726	0.001106	2.63E-08	6.11E-05	4.61E-05	4.03E-06	1.33E-03
San Bernardinc	2023	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Nat Gas	1121.712	7.18E-05	0.000559	0.020342	4.35E-08	5.47E-05	4.13E-05	1.79E-06	5.93E-04
San Bernardinc	2023	Industrial - Misc - Forklifts	Aggregate	Aggregate	Gasoline	1825045.45	0.039132	0.182498	4.289777	0.000414	0.002882	0.002178	41.33434	1.37E+04
San Bernardinc	2023	Industrial - Misc - Forklifts	Aggregate	Aggregate	Nat Gas	4111698.26	1.33E-05	0.324229	3.007048	4.78E-09	0.006626	4.94E-06	74.42888	2.46E+04
San Bernardinc	2023	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Gasoline	31183.12	0.002019	0.002678	0.1582	7.89E-06	4.52E-05	3.41E-05	0.570242	1.89E+02
San Bernardinc	2023	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	69.17	0.00021	0.001364	0.000849	2.02E-08	4.65E-05	3.51E-05	3.19E-06	1.06E-03
San Bernardinc	2023	Industrial - Misc - Other Material Handling Equipment	Aggregate	Aggregate	Gasoline	13658.3	0.000265	0.001338	0.01478	3.28E-06	2.35E-05	1.78E-05	0.337539	1.12E+02
San Bernardinc	2023	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Gasoline	103707.5	0.00269	0.007468	0.22624	2.66E-05	0.000168	0.000127	2.377635	7.87E+02
San Bernardinc	2023	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	18.668	5.36E-05	0.000354	0.000237	5.45E-09	1.22E-05	9.18E-06	8.34E-07	2.76E-04
San Bernardinc	2023	Industrial - Mower	Aggregate	Aggregate	Diesel	53014.48601	0.001336	0.009687	0.010973	1.55E-05	0.000444	0.000408	1.631457	5.40E+02
San Bernardinc	2023	Industrial - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	129719.7479	0.003452	0.02284	0.019168	3.78E-05	0.001312	0.001207	3.99197	1.32E+03
San Bernardinc	2023	Industrial - Other Truck	Aggregate	Aggregate	Diesel	78413.53761	0.001237	0.007829	0.006714	2.29E-05	0.000384	0.000353	2.413083	7.99E+02
San Bernardinc	2023	Industrial - Railcars or Track Cars	Aggregate	Aggregate	Diesel	6058.91984	8.78E-05	0.000562	0.000687	1.77E-06	2.8E-05	2.57E-05	0.186456	6.17E+01
San Bernardinc	2023	Industrial - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	25268.26287	0.000712	0.004688	0.004641	7.37E-06	0.000281	0.000259	0.7776	2.57E+02
San Bernardinc	2023	Industrial - Tow Tractor	Aggregate	Aggregate	Diesel	163.3606593	3.09E-06	3.47E-05	1.02E-05	4.76E-08	1.13E-06	1.04E-06	0.005027	1.66E+00
San Bernardinc	2023	Industrial - Yard Goat	Aggregate	Aggregate	Diesel	2.09E+05	3.60E-03	2.03E-02	3.11E-02	6.09E-05	1.04E-03	9.54E-04	6.42E+00	2.13E+03
TOTAL LIGHT COMMERCIAL & INDUSTRIAL						1.43E+07	1.03E+00	1.25E+00	4.68E+01	2.54E-03	2.67E-02	1.68E-02	2.79E+02	9.23E+04
ESTIMATED Barstow						2.87E+05	2.06E-02	2.51E-02	9.36E-01	5.07E-05	5.34E-04	3.37E-04	5.57E+00	
ESTIMATED Barstow (lbs/day)							41	50	1,872	0	1	1	11,143	
ESTIMATED Barstow (tons/year)							7.53	9.15	341.59	0.02	0.19	0.12		1,844.90

EMPLOYMENT: http://lehd.ces.census.gov/		Existing
Employment in San Bernardino County (2023 Q3 Start)		716,320
Employment in Barstow		14,324
Percent in the City		2.00%

Available Farmland Worksheet

San Bernardino County										
Available Farmland (Acreage) ^a										
	2004	2006	2008	2010	2012	2014	2016	2018	Forecast	Forecast
									2023	2048
Prime Farmland	20,316	17,046	14,090	12,848	12,482	11,714	11,323	10,887	6,545	-8,651
Farmland of Statewide Importance	8,777	7,938	6,747	6,242	5,860	5,702	5,770	5,568	3,946	-1,534
Unique Farmland	2,653	3,150	2,661	2,511	2,623	2,674	2,738	2,700	2,601	2,366
Farmland of Local Importance	2,929	2,785	1,828	1,160	956	606	562	549	-838	-5,548
Total Farmland	34,675	30,919	25,326	22,761	21,921	20,696	20,393	19,704	12,252	-13,366
Percent Change from Prior Year	NA	-10.83%	-18.09%	-10.13%	-3.69%	-5.59%	-1.46%	-3.38%		
Average Yearly Change (2004 to 2023):										-1.62%

City of Barstow		Available Farmland (Acreage)									
	2002	2004	2006	2008	2010	2012	2014	2016	2017	2023 ^b	2048 ^c
Prime Farmland										1,546	0
Farmland of Statewide Importance										269	0
Unique Farmland										143	0
Farmland of Local Importance										12	12
Estimated Total Farmland ^d	3,582	3,194	2,616	2,351	2,265	2,138	2,107	2,036	2,003	1,970	12
Percent Change from Prior Year	NA	-10.83%	-18.09%	-10.13%	-3.69%	-5.59%	-1.46%	-3.38%	-1.62%		

Sources:

a.County acreage based on the California Department of Conservation data: <https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanBernardino.aspx>

b. City acreage from Table 5.2-4 of the DEIR.

c. Based on the assumption on the Impact 5.2-1 discussion of the DEIR.

8. Area Source: Consumer Products Emissions Calculations

This page intentionally left blank.

City of Barstow General Plan Area Sources - Consumer Products (Residential)

Residential Consumer Product Use			
		Emissions = EF x Building Area	
Statewide (2008)		EF =	2.14E-05 lbs/sqft/day
South Coast AQMD Rule 1143		EF =	1.98E-05 lbs/sqft/day
Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide . Appendix D3 - Consumer Products Use.			

AVERAGE HOUSING SQFT ASSUMPTIONS			
Year Structure was Built	Percent of Housing Stock ^a	Average Square Feet of New Single Family Homes ^b	Average Square Feet (Weighted)
2020 or Later	0.20%	2,441	5
2010 to 2019	1.50%	2,524	38
2000 to 2009	7.00%	2,404	168
1990 to 1999	10.10%	2,116	214
1980 to 1989	18.20%	1,819	331
1979 or earlier	63.10%	1,699	1,072
Total	100%		1,828
Sources/Notes:			
a. United States Census Bureau, Selected Housing Characteristics, City of Barstow, 2024. Table DP04. American Community Survey 1-Year Estimates, Year structure built. https://data.census.gov/table/ACSDP5Y2022.DP04?q=DP04&g=160XX00US0604030			
b. United States Census Bureau, Characteristics of New Housing, Characteristics of New Single-Family Houses Completed, Median and Average Square Feet by Location. https://www.census.gov/construction/chars/xls/squarefeet_cust.xls			

	Existing	Proposed Project
Households	11,986	18,314
Residential SQFT	21,911,327	37,359,557
lbs VOC per day	469	799
Tons VOC per year ¹	86	146
¹ Assumes 365 days per year.		

City of Barstow General Plan Area Sources - Consumer Products (Non-Residential)

Non-Residential Consumer Product Use		
	Emissions = EF x Building Area	
Statewide (2008)	EF =	2.14E-05 lbs/sqft/day
South Coast AQMD Rule 1143	EF =	1.98E-05 lbs/sqft/day
Source: California Air Pollution Control Officer's Association (CAPCOA). 2022, April. California Emissions Estimator Model (CalEEMod) User's Guide Version 2022.1. https://www.caleemod.com/user-guide . Appendix D3 - Consumer Products Use.		

	Existing	Proposed Project
Non-Residential Building Square Feet	11,071,591	26,412,789
lbs VOC per day	237	565
Tons VOC per year ¹	43	103
¹ Assumes 365 days per year.		

Average Square feet of Floor Area in Single-Family Houses Completed - West

a. United States Census Bureau, Characteristics of New Housing, Characteristics of New Single-Family Houses Completed, Median and Average Square Feet by Location. Obtained from https://www.census.gov/construction/chars/xls/squarefeet_cust.xls

Year	Building Square Feet
1979 or Earlier	1,699
1973	1,715
1974	1,660
1975	1,635
1976	1,685
1977	1,730
1978	1,740
1979	1,730
1980 to 1989	1,819
1980	1735
1981	1735
1982	1740
1983	1695
1984	1785
1985	1770
1986	1800
1987	1870
1988	1995
1989	2065
1990 to 1999	2,116
1990	2160
1991	2155
1992	2090
1993	2050
1994	2025
1995	2045
1996	2070
1997	2135
1998	2200
1999	2234
2000 to 2009	2,404
2000	2244
2001	2317
2002	2350
2003	2387
2004	2352
2005	2434
2006	2488
2007	2524
2008	2508
2009	2434

2010 to 2019		2,524
2010		2386
2011		2457
2012		2502
2013		2523
2014		2603
2015		2615
2016		2632
2017		2548
2018		2527
2019		2450
2020 and Later		2,441
2020		2449
2021		2446
2022		2457
2023		2413

9. Refrigerants Emissions Calculations

This page intentionally left blank.

City of Barstow General Plan Refrigerants Worksheet

2021 Statewide Refrigerant Use (AR4)

Main Sector	Activity Subset	GHGs	Year 2021	GHGs		Year 2021	
			MTCO ₂ e (AR4		MTCO ₂ e (AR5		
			GWP _s)	AR4 GWP _s	Metric Ton	AR5 GWP _s	GWP _s)
Commercial	Refrigeration and Air Conditioning	HFC-32	516,335.82	675	764.94	677	517,865.70
Commercial	Refrigeration and Air Conditioning	HFC-152a	15.21872187	124	0.12	138	16.93696466
Commercial	Refrigeration and Air Conditioning	HFC-143a	1,942,719.24	4,470	434.61	4,800	2,086,141.47
Commercial	Refrigeration and Air Conditioning	HFC-134a	2,208,681.84	1,430	1,544.53	1,300	2,007,892.58
Commercial	Refrigeration and Air Conditioning	HFC-125	4,395,645.63	3,500	1,255.90	3,170	3,981,199.04
Commercial	Refrigeration and Air Conditioning	HFC-236fa	49,838.74	9,810	5.08	8,060	40,948.04
Industrial	Refrigeration and Air Conditioning	HFC-125	575,082.52	3,500	164.31	3,170	520,860.45
Industrial	Refrigeration and Air Conditioning	HFC-236fa	14,886.90	9,810	1.52	8,060	12,231.23
Industrial	Refrigeration and Air Conditioning	HFC-134a	968,367.78	1,430	677.18	1,300	880,334.35
Industrial	Refrigeration and Air Conditioning	HFC-32	57,870.73	675	85.73	675	57,870.73
Industrial	Refrigeration and Air Conditioning	HFC-143a	301,517.84	4,470	67.45	4,800	323,777.55
Industrial	Refrigeration and Air Conditioning	HFC-152a	10.1033273	124	0.08	138	11.24402554
Residential	Refrigeration and Air Conditioning	HFC-125	3,426,121.59	3,500	978.89	3,170	3,103,087.27
Residential	Refrigeration and Air Conditioning	HFC-134a	120,534.71	1,430	84.29	1,300	109,577.01
Residential	Refrigeration and Air Conditioning	HFC-32	658,967.08	675	976.25	675	658,967.08
Transportation	Refrigeration and Air Conditioning	HFC-125	161,190.70	3,500	46.05	3,170	145,992.72
Transportation	Refrigeration and Air Conditioning	HFC-32	185.2831341	675	0.27	675	185.2831341
Transportation	Refrigeration and Air Conditioning	HFC-134a	3,385,055.63	1,430	2,367.17	1,300	3,077,323.30
Transportation	Refrigeration and Air Conditioning	HFC-143a	240,778.13	4,470	53.87	4,800	258,553.70
						Total	17,782,836
US Census 2021 California Population						People	39,455,353
						MT/person	0.45

Notes

AR4=Intergovernmental Panel on Climate Change Fourth Assessment Report

AR5=Intergovernmental Panel on Climate Change Fifth Assessment Report

GWP=Global warming potential

	Existing	Proposed Project
Population	34,302	52,833
MTCO ₂ e	15,460	23,812

Source: CARB. Greenhouse Gas Emissions Inventory Query Tool for years 2000 to 2020 (15th Edition) - Query Results. Main Activity: Use of substitutes for ozone depleting substances Activity Subset: Refrigeration and Air Conditioning. AR 4. <https://ww2.arb.ca.gov/applications/greenhouse-gas-emission-inventory-0>

U.S. Census Bureau. 2023. Table DP05 2021: ACS 5-Year Demographics and Housing Estimates. <https://data.census.gov/table/ACSDP5YSPT2021.DP05?g=040XX00US06>.

10. BIG Equipment Emissions

This page intentionally left blank.

BIG Equipment Emissions - Summary*

*Data provided by Kimley-Horn and Associates, Inc. 2025

Unmitigated																							
2028 Emissions (pounds/day)								2033 Emissions (pounds/day)								2048 Emissions (pounds/day)							
Equipment	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂		
Rubber Tired Gantry (RTG) Crane	1.04	4.63	4.17	0.02	0.23	0.21	1,908.36	1.19	5.29	4.76	0.02	0.27	0.24	2,180.99	1.07	0.76	5.97	0.03	0.06	0.06	2,726.23		
Rail Car Wheel Change Machine	0.61	4.47	5.61	0.01	0.18	0.16	1,462.72	0.61	4.47	5.61	0.01	0.18	0.16	1,462.72	0.70	3.26	7.07	0.02	0.07	0.07	1,861.78		
Air Compressors	0.17	1.27	1.66	0.00	0.03	0.02	210.16	0.17	1.27	1.66	0.00	0.03	0.02	210.16	0.22	1.77	2.43	0.00	0.01	0.01	315.72		
Welders	0.05	0.40	0.47	0.00	0.01	0.01	65.63	0.05	0.40	0.47	0.00	0.01	0.01	65.63	0.09	0.75	0.92	0.00	0.01	0.01	131.84		
Truck Transport Refrigeration Un	22.85	20.39	2.62	0.00	0.33	0.30	4,093.51	28.97	25.84	3.32	0.00	0.42	0.38	5,189.25	35.23	31.80	3.87	0.00	0.23	0.21	6,343.72		
Emergency Generators	90.17	372.00	233.25	0.44	13.26	13.26	46,111.81	90.17	372.00	233.25	0.44	0.89	13.26	46,111.81	90.17	372.00	233.25	0.44	13.26	13.26	46,111.81		
Warehouse Cargo Handling Equip	28.41	147.75	2,032.73	2.84	5.68	5.68	300,611.39	28.41	147.75	2,032.73	2.84	0.00	5.68	300,611.39	28.41	147.75	2,032.73	2.84	5.68	5.68	300,611.39		
Total	143.30	550.91	2,280.50	3.32	19.71	19.65	354,463.58	Total	149.57	557.02	2,281.80	3.32	1.78	19.76	355,831.94	Total	155.89	558.09	2,286.24	3.33	19.32	19.30	358,102.48

2028 Emissions (tons/year)							MT/year		2033 Emissions (tons/year)							MT/year		2048 Emissions (tons/year)							MT/year	
Equipment	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CO ₂	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CO ₂	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	CO ₂		
Rubber Tired Gantry (RTG) Crane	0.19	0.84	0.76	0.00	0.04	0.04	348.28	316	0.22	0.96	0.87	0.00	0.05	0.04	398.03	316	0.20	0.14	1.09	0.00	0.01	0.01	497.54	451		
Rail Car Wheel Change Machine	0.11	0.82	1.02	0.00	0.03	0.03	266.95	242	0.11	0.82	1.02	0.00	0.03	0.03	266.95	242	0.13	0.60	1.29	0.00	0.01	0.01	339.77	308		
Air Compressors	0.03	0.23	0.30	0.00	0.00	0.00	38.35	35	0.03	0.23	0.30	0.00	0.00	0.00	38.35	35	0.04	0.32	0.44	0.00	0.00	0.00	57.62	52		
Welders	0.01	0.07	0.09	0.00	0.00	0.00	11.98	11	0.01	0.07	0.09	0.00	0.00	0.00	11.98	11	0.02	0.14	0.17	0.00	0.00	0.00	24.06	22		
Truck Transport Refrigeration Un	4.17	3.72	0.48	0.00	0.06	0.05	747.07	678	5.29	4.72	0.61	0.00	0.08	0.07	947.04	678	6.43	5.80	0.71	0.00	0.04	0.04	1,157.73	1,050		
Emergency Generators	2.25	9.30	5.83	0.01	0.33	0.33	1,152.79	1,046	2.25	9.30	5.83	0.01	0.33	0.33	1,152.79	1,046	2.25	9.30	5.83	0.01	0.33	0.33	1,152.79	1,046		
Warehouse Cargo Handling Equip	5.19	26.96	370.97	0.52	1.04	1.04	54,861.57	49,770	5.19	26.96	370.97	0.52	1.04	1.04	54,861.57	49,770	6.31	27.43	366.34	0.52	1.10	1.10	54,828.72	49,740		
Total	11.95	41.95	379.45	0.54	1.51	1.50	57,426.98	52,097	Total	13.10	43.07	379.69	0.54	1.53	1.52	57,676.71	52,323	15.38	43.72	375.87	0.54	1.50	1.49	58,058.23	52,670	
IMF Emergency Generators	1.51	6.74	3.84	0.01	0.22	0.22	771.10	700	1.51	6.74	3.84	0.01	0.22	0.22	771.10	700	1.51	6.74	3.84	0.01	0.22	0.22	771.10	700		
arehouse Emergency Generators	0.75	2.56	1.99	0.00	0.11	0.11	381.69	346	0.75	2.56	1.99	0.00	0.11	0.11	381.69	346	0.75	2.56	1.99	0.00	0.11	0.11	381.69	346		

Mitigated - Renewable Diesel RTG, Tier 4 Generators, ZE Warehouse CHE																							
2028 Emissions (pounds/day)								2033 Emissions (pounds/day)								2048 Emissions (pounds/day)							
Equipment	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂		
Rubber Tired Gantry (RTG) Crane	1.04	4.16	3.75	0.02	0.16	0.15	725.18	1.19	4.76	4.29	0.02	0.19	0.17	828.77	1.07	0.68	5.37	0.03	0.04	0.04	1,035.97		
Rail Car Wheel Change Machine	0.61	4.47	5.61	0.01	0.18	0.16	1,462.72	0.61	4.47	5.61	0.01	0.18	0.16	1,462.72	0.70	3.26	7.07	0.02	0.07	0.07	1,861.78		
Air Compressors	0.17	1.27	1.66	0.00	0.03	0.02	210.16	0.17	1.27	1.66	0.00	0.03	0.02	210.16	0.22	1.77	2.43	0.00	0.01	0.01	315.72		
Welders	0.05	0.40	0.47	0.00	0.01	0.01	65.63	0.05	0.40	0.47	0.00	0.01	0.01	65.63	0.09	0.75	0.92	0.00	0.01	0.01	131.84		
Truck Transport Refrigeration Un	22.85	20.39	2.62	0.00	0.33	0.30	4,093.51	28.97	25.84	3.32	0.00	0.42	0.38	5,189.25	35.23	31.80	3.87	0.00	0.23	0.21	6,343.72		
Emergency Generators	12.38	44.20	229.83	0.44	1.77	1.77	46,111.81	12.38	44.20	229.83	0.44	1.77	1.77	46,111.81	12.38	44.20	229.83	0.44	1.77	1.77	46,111.81		
Warehouse Cargo Handling Equi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
Total	37.10	74.89	243.94	0.48	2.47	2.41	52,669.01	37.10	74.89	243.94	0.48	2.47	2.41	52,669.01	49.69	82.46	249.50	0.49	2.13	2.11	55,800.83		

2028 Emissions (tons/year)									2033 Emissions (tons/year)									2048 Emissions (tons/year)								
Equipment	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	MT/year	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	MT/year	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂	MT/year	CO ₂	MT/year
Rubber Tired Gantry (RTG) Crane	0.19	0.76	0.68	0.00	0.03	0.03	132.34	120	0.22	0.87	0.78	0.00	0.03	0.03	151.25	137	0.20	0.12	0.98	0.00	0.01	0.01	189.06	172		
Rail Car Wheel Change Machine	0.11	0.82	1.02	0.00	0.03	0.03	266.95	242	0.11	0.82	1.02	0.00	0.03	0.03	266.95	242	0.13	0.60	1.29	0.00	0.01	0.01	339.77	308		
Air Compressors	0.03	0.23	0.30	0.00	0.00	0.00	38.35	35	0.03	0.23	0.30	0.00	0.00	0.00	38.35	35	0.04	0.32	0.44	0.00	0.00	0.00	57.62	52		
Welders	0.01	0.07	0.09	0.00	0.00	0.00	11.98	11	0.01	0.07	0.09	0.00	0.00	0.00	11.98	11	0.02	0.14	0.17	0.00	0.00	0.00	24.06	22		
Truck Transport Refrigeration Un	4.17	3.72	0.48	0.00	0.06	0.05	747.07	678	5.29	4.72	0.61	0.00	0.08	0.07	947.04	859	6.43	5.80	0.71	0.00	0.04	0.04	1,157.73	1,050		
Emergency Generators	0.31	1.10	5.75	0.01	0.04	0.04	1,152.79	1,046	0.31	1.10	5.75	0.01	0.04	0.04	1,152.79	1,046	0.31	1.10	5.75	0.01	0.04	0.04	1,152.79	1,046		
Warehouse Cargo Handling Equi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0		
Total	4.82	6.71	8.32	0.02	0.17	0.16	2,349.48	2,131	4.82	6.71	8.32	0.02	0.17	0.16	2,349.48	2,131	7.12	8.09	9.33	0.02	0.11	0.11	2,921.04	2,650		
IMF Emergency Generators	0.0207	0.073911	0.38434	0.0007	0.003	0.00296	77.1100322	70	0.0207	0.0739	0.38434	0.0007	0.003	0.003	77.110032	70	0.0207	0.07391	0.38434	0.0007	0.003	0.003	77.110032	70		
arehouse Emergency Generators	0.02095	0.074835	0.38914	0.0007	0.003	0.00299	78.0739076	71	0.021	0.0748	0.38914	0.0007	0.003	0.003	78.073908	71	0.021	0.07484	0.38914	0.0007	0.003	0.003	78.073908	71		

Renewable Diesel Adjustment							
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂
Tier 1-3		0.1	0.1		0.3	0.3	0.62
Tier 4					0.3	0.3	0.62

11. BIG Area Source Emissions Summary

This page intentionally left blank.

BIG Area Source Emissions - Summary*

*Data provided by Kimley-Horn and Associates, Inc. 2025

2028 Unmitigated pounds/day						
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Architectural Coatings	58.17	-	-	-	-	-
Degreaser on Parking Surface	0.01	-	-	-	-	-
Consumer Products	195.81	-	-	-	-	-
Landscape Equipment	1.83	0.62	71.78	0.00	0.00	0.00
Natural Gas	-	-	-	-	-	-
Electricity	-	-	-	-	-	-
Water	-	-	-	-	-	-
Wastewater	-	-	-	-	-	-
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-
<i>Total</i>	<i>255.81</i>	<i>0.62</i>	<i>71.78</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>

Area Sources Total	255.81	0.62	71.78	0.00	0.00	0.00
Natural Gas	-	-	-	-	-	-
Electricity	-	-	-	-	-	-
Water/Wastewater	0.00	0.00	0.00	0.00	0.00	0.00
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-

2028 Mitigated pounds/day						
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Architectural Coatings	11.62	-	-	-	-	-
Degreaser on Parking Surface	0.01	-	-	-	-	-
Consumer Products	195.81	-	-	-	-	-
Landscape Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	-	-	-	-	-	-
Water	-	-	-	-	-	-
Wastewater	-	-	-	-	-	-
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-
<i>Total</i>	<i>207.44</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>

Area Sources Total	207.44	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	-	-	-	-	-	-
Water/Wastewater	0.00	0.00	0.00	0.00	0.00	0.00
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-

2028 Unmitigated tons/year						MT/year
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO _{2e}
10.62	-	-	-	-	-	-
0.00	-	-	-	-	-	-
35.74	-	-	-	-	-	-
0.16	0.06	6.46	0.00	0.00	0.00	21
-	-	-	-	-	-	-
-	-	-	-	-	-	27,822
-	-	-	-	-	-	24
-	-	-	-	-	-	40
-	-	-	-	-	-	2,396
-	-	-	-	-	-	40,372
46.52	0.06	6.46	0.00	0.00	0.00	70,675
46.52	0.06	6.46	0.00	0.00	0.00	21
-	-	-	-	-	-	-
-	-	-	-	-	-	27,822
0.00	0.00	0.00	0.00	0.00	0.00	64
-	-	-	-	-	-	2,396
-	-	-	-	-	-	40,372

2028 Mitigated tons/year						MT/year
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO _{2e}
2.12	-	-	-	-	-	-
0.00	-	-	-	-	-	-
35.74	-	-	-	-	-	-
0.00	0.00	0.00	0.00	0.00	0.00	0
0.00	0.00	0.00	0.00	0.00	0.00	
-	-	-	-	-	-	27,822
-	-	-	-	-	-	24
-	-	-	-	-	-	40
-	-	-	-	-	-	599
-	-	-	-	-	-	0
37.86	0.00	0.00	0.00	0.00	0.00	28,485
37.86	0.00	0.00	0.00	0.00	0.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0
-	-	-	-	-	-	27,822
0.00	0.00	0.00	0.00	0.00	0.00	64
-	-	-	-	-	-	599
-	-	-	-	-	-	0

2033 Unmitigated pounds/day					
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
58.17	-	-	-	-	-
0.01	-	-	-	-	-
195.81	-	-	-	-	-
1.83	0.62	71.78	0.00	0.00	0.00
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
255.81	0.62	71.78	0.00	0.00	0.00
255.81	0.62	71.78	0.00	0.00	0.00
-	-	-	-	-	-
-	-	-	-	-	-
0.00	0.00	0.00	0.00	0.00	0.00
-	-	-	-	-	-
-	-	-	-	-	-

2033 Mitigated pounds/day					
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
11.62	-	-	-	-	-
0.01	-	-	-	-	-
195.81	-	-	-	-	-
0.00	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
207.44	0.00	0.00	0.00	0.00	0.00
207.44	0.00	0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00	0.00	0.00
-	-	-	-	-	-
0.00	0.00	0.00	0.00	0.00	0.00
-	-	-	-	-	-
-	-	-	-	-	-

2033 Unmitigated tons/year						MT/year
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂ e
10.62	-	-	-	-	-	-
0.00	-	-	-	-	-	-
35.74	-	-	-	-	-	-
0.16	0.06	6.46	0.00	0.00	0.00	21
-	-	-	-	-	-	-
-	-	-	-	-	-	21,757
-	-	-	-	-	-	19
-	-	-	-	-	-	40
-	-	-	-	-	-	2,396
-	-	-	-	-	-	40,372
46.52	0.06	6.46	0.00	0.00	0.00	64,605
46.52	0.06	6.46	0.00	0.00	0.00	21
-	-	-	-	-	-	-
-	-	-	-	-	-	21,757
0.00	0.00	0.00	0.00	0.00	0.00	59
-	-	-	-	-	-	2,396
-	-	-	-	-	-	40,372

2033 Mitigated tons/year						MT/year
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂ e
2.12	-	-	-	-	-	-
0.00	-	-	-	-	-	-
35.74	-	-	-	-	-	-
0.00	0.00	0.00	0.00	0.00	0.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0
-	-	-	-	-	-	21,757
-	-	-	-	-	-	19
-	-	-	-	-	-	40
-	-	-	-	-	-	599
-	-	-	-	-	-	0
37.86	0.00	0.00	0.00	0.00	0.00	22,415
37.86	0.00	0.00	0.00	0.00	0.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0
-	-	-	-	-	-	21,757
0.00	0.00	0.00	0.00	0.00	0.00	59
-	-	-	-	-	-	599
-	-	-	-	-	-	0

2048 Unmitigated pounds/day

	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Architectural Coatings	58.17	-	-	-	-	-
Degreaser on Parking Surfaces	0.01	-	-	-	-	-
Consumer Products	195.81	-	-	-	-	-
Landscape Equipment	1.83	0.62	71.78	0.00	0.00	0.00
Natural Gas	-	-	-	-	-	-
Electricity	-	-	-	-	-	-
Water	-	-	-	-	-	-
Wastewater	-	-	-	-	-	-
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-
<i>Total</i>	<i>255.81</i>	<i>0.62</i>	<i>71.78</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>

Area Sources Total	255.81	0.62	71.78	0.00	0.00	0.00
Natural Gas	-	-	-	-	-	-
Electricity	-	-	-	-	-	-
Water/Wastewater	0.00	0.00	0.00	0.00	0.00	0.00
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-

2048 Mitigated pounds/day

	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Architectural Coatings	11.62	-	-	-	-	-
Degreaser on Parking Surfaces	0.01	-	-	-	-	-
Consumer Products	195.81	-	-	-	-	-
Landscape Equipment	0.00	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	-	-	-	-	-	-
Water	-	-	-	-	-	-
Wastewater	-	-	-	-	-	-
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-
<i>Total</i>	<i>207.44</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>	<i>0.00</i>

Area Sources Total	207.44	0.00	0.00	0.00	0.00	0.00
Natural Gas	0.00	0.00	0.00	0.00	0.00	0.00
Electricity	-	-	-	-	-	-
Water/Wastewater	0.00	0.00	0.00	0.00	0.00	0.00
Solid Waste	-	-	-	-	-	-
Refrigerants	-	-	-	-	-	-

2048 Unmitigated tons/year						MT/year
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO _{2e}
10.62	-	-	-	-	-	-
0.00	-	-	-	-	-	-
35.74	-	-	-	-	-	-
0.16	0.06	6.46	0.00	0.00	0.00	21
-	-	-	-	-	-	-
-	-	-	-	-	-	0
-	-	-	-	-	-	0
-	-	-	-	-	-	40
-	-	-	-	-	-	2,396
-	-	-	-	-	-	40,372
46.52	0.06	6.46	0.00	0.00	0.00	42,829
46.52	0.06	6.46	0.00	0.00	0.00	21
-	-	-	-	-	-	-
-	-	-	-	-	-	0
0.00	0.00	0.00	0.00	0.00	0.00	40
-	-	-	-	-	-	2,396
-	-	-	-	-	-	40,372

2048 Mitigated tons/year						MT/year
ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO _{2e}
0.00	-	-	-	-	-	-
0.00	-	-	-	-	-	-
35.74	-	-	-	-	-	-
0.00	0.00	0.00	0.00	0.00	0.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0
-	-	-	-	-	-	0
-	-	-	-	-	-	0
-	-	-	-	-	-	40
-	-	-	-	-	-	599
-	-	-	-	-	-	0
35.74	0.00	0.00	0.00	0.00	0.00	639
35.74	0.00	0.00	0.00	0.00	0.00	0
0.00	0.00	0.00	0.00	0.00	0.00	0
-	-	-	-	-	-	0
0.00	0.00	0.00	0.00	0.00	0.00	40
-	-	-	-	-	-	599
-	-	-	-	-	-	0

12. BIG Construction Emissions Summary

This page intentionally left blank.

BIG Project Daily Construction Emissions*

*Data provided by Kimley-Horn and Associates, Inc. 2025

Construction Emissions

Unmitigated Construction									
		Pounds/Day				MT/yr			
		2025	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM CO2e	
South Main	1 Demo-SP	1 Demo-SP		7.15	59.40	56.30	0.16	2.46	2.26 264.51
South Main	2 Mass Grading	2 Mass Grading		23.75	189.53	187.38	0.52	7.91	7.27 2305.68
South Main	3 Bridges-Culv	3 Bridges-Culv		5.12	36.83	44.86	0.13	1.48	1.36 555.22
IMF	1 Demo-SP	1 Demo-SP		44.98	371.70	354.77	0.98	15.51	14.27 1641.78
IMF	2 Mass Grading	2 Mass Grading		141.55	1233.17	1132.05	2.93	52.80	48.58 18126.09
IMF	3 Drainage-Ug	3 Drainage-Ug		15.75	108.67	131.79	0.39	4.37	4.02 1968.05
IMF	4 Bridges-Culv	4 Bridges-Culv		9.05	69.69	82.50	0.22	2.88	2.65 836.10
IMF	5 Fine Grading	5 Fine Grading		17.81	142.68	148.69	0.38	6.10	5.61 557.34
BSY	1 Demo-SP	1 Demo-SP		122.23	1009.54	960.66	2.67	42.09	38.73 4456.60
North Main	1 Demo-SP	1 Demo-SP		3.76	30.20	29.65	0.08	1.25	1.15 139.80
33 KV	1 33KV	1 33KV		4.68	33.92	47.01	0.13	1.34	1.23 587.64
		**Peak Day is Se		363.85	3036.12	2899.60	7.88	127.73	117.51

Mitigated Construction									
		Pounds/Day				MT/yr			
		2025	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e	
South Main	1 Demo-SP		6.82	50.17	56.30	0.16	1.46	1.30	100.51
South Main	2 Mass Grading		21.93	106.83	187.38	0.52	3.56	2.72	876.16
South Main	3 Bridges-Culv		4.96	17.00	44.73	0.13	0.61	0.41	210.99
IMF	1 Demo-SP		42.05	301.96	354.77	0.98	8.76	7.77	623.88
IMF	2 Mass Grading		127.24	858.06	1132.05	2.93	26.07	22.29	6887.91
IMF	3 Drainage-Ug		15.59	78.15	131.79	0.39	2.34	1.90	747.86
IMF	4 Bridges-Culv		8.52	32.63	81.88	0.22	1.11	0.79	317.72
IMF	5 Fine Grading		15.35	32.04	148.69	0.38	1.49	0.75	211.79
BSY	1 Demo-SP		114.30	827.67	960.66	2.67	23.92	21.30	1693.51
North Main	1 Demo-SP		3.56	23.78	29.65	0.08	0.70	0.61	53.12
33 KV	1 33KV		4.66	11.57	46.98	0.13	0.52	0.27	223.30
			336.14	2258.17	2899.57	7.88	67.32	58.17	

Unmitigated Construction									
		Pounds/Day				MT/yr			
		2026	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM CO2e	
South Main	2 Mass Grading	2 Mass Grading		23.75	189.53	187.38	0.52	7.91	7.27 2561.86
South Main	3 Bridges-Culv	3 Bridges-Culv		5.12	36.83	44.86	0.13	1.48	1.36 764.98
South Main	4 Fine Grading	4 Fine Grading		16.02	125.63	132.36	0.35	5.32	4.90 374.33
South Main	5 Track-Signal	5 Track-Signal		10.30	45.78	55.74	0.15	3.86	3.55 969.17
IMF	2 Mass Grading	2 Mass Grading		141.55	1233.17	1132.05	2.93	52.80	48.58 2301.73
IMF	3 Drainage-Ug	3 Drainage-Ug		15.75	108.67	131.79	0.39	4.37	4.02 3550.20
IMF	4 Bridges-Culv	4 Bridges-Culv		9.05	69.69	82.50	0.22	2.88	2.65 2229.60
IMF	5 Fine Grading	5 Fine Grading		17.81	142.68	148.69	0.38	6.10	5.61 2080.74
IMF	6 Bldg-Paving	6 Bldg-Paving		4.36	34.08	40.49	0.10	1.38	1.27 1478.77
IMF	7 Track-Signal	7 Track-Signal		9.32	31.38	37.36	0.09	4.02	3.69 1201.82
BSY	2 Mass Grading	2 Mass Grading		562.19	4961.60	4501.93	11.52	213.30	196.23 53104.92
BSY	3 Drainage-Ug	3 Drainage-Ug		5.59	38.17	47.28	0.14	1.51	1.39 1386.29
BSY	4 Bridges-Culv	4 Bridges-Culv		10.20	78.12	93.03	0.25	3.23	2.97 2416.87
BSY	5 Fine Grading	5 Fine Grading		29.22	249.82	250.77	0.58	11.16	10.27 3607.06
North Main	2 Mass Grading	2 Mass Grading		25.57	208.65	202.63	0.55	8.78	8.08 2547.93
Warehouse	1 WhseCon	1 WhseCon		37.13	253.86	282.00	0.88	10.05	9.25 6478.00
33 KV	1 33KV	1 33KV		37.13	253.86	282.00	0.88	10.05	9.25 13427.91
Solar	1 Solar	1 Solar		1.52	11.31	15.98	0.04	0.45	0.41 474.00
		(february)		726.07	6162.60	5791.98	15.13	265.59	244.35

Mitigated Construction									
		Pounds/Day				MT/yr			
		2026	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e	
South Main	2 Mass Grading		21.93	106.83	187.38	0.52	3.56	2.72	973.51
South Main	3 Bridges-Culv		4.96	17.00	44.73	0.13	0.61	0.41	290.69
South Main	4 Fine Grading		14.05	29.43	132.36	0.35	1.37	0.69	142.25
South Main	5 Track-Signal		10.21	22.61	55.43	0.15	2.23	1.86	368.28
IMF	2 Mass Grading		127.24	858.06	1132.05	2.93	26.07	22.29	874.66
IMF	3 Drainage-Ug		15.59	78.15	131.79	0.39	2.34	1.90	1349.08
IMF	4 Bridges-Culv		8.52	32.63	81.88	0.22	1.11	0.79	847.25
IMF	5 Fine Grading		15.35	32.04	148.69	0.38	1.49	0.75	790.68
IMF	6 Bldg-Paving		4.05	16.64	39.86	0.10	0.54	0.40	561.93
IMF	7 Track-Signal		9.17	16.57	37.33	0.09	2.45	2.15	456.69
BSY	2 Mass Grading		502.42	3523.21	4501.93	11.52	105.96	91.70	20179.87
BSY	3 Drainage-Ug		5.58	25.77	47.28	0.14	0.80	0.63	526.79
BSY	4 Bridges-Culv		9.64	37.08	92.41	0.25	1.26	0.89	918.41
BSY	5 Fine Grading		23.61	48.55	250.77	0.58	2.26	1.13	1370.68
North Main	2 Mass Grading		23.46	119.18	202.63	0.55	3.96	3.06	968.21
Warehouse	1 WhseCon		35.45	207.62	282.00	0.88	5.75	5.09	2461.64
33 KV	1 33KV		35.45	207.62	282.00	0.88	5.75	5.09	5102.61
Solar	1 Solar		1.47	4.72	15.92	0.04	0.18	0.11	36.61
			654.95	4179.29	5790.58	15.13	129.15	109.66	

		Pounds/Day				MT/yr			
		2027	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM CO2e	
IMF	6 Bldg-Paving	6 Bldg-Paving		4.36	34.08	40.49	0.10	1.38	1.27 75.19
IMF	7 Track-Signal	7 Track-Signal		9.32	31.38	37.36	0.09	4.02	3.69 13.30
BSY	3 Drainage-Ug	3 Drainage-Ug		5.59	38.17	47.28	0.14	1.51	1.39 271.68
BSY	4 Bridges-Culv	4 Bridges-Culv		10.20	78.12	93.03	0.25	3.23	2.97 473.66
BSY	5 Fine Grading	5 Fine Grading		29.22	249.82	250.77	0.58	11.16	10.27 5197.57
BSY	6 Track-Signal	6 Track-Signal		34.94	69.77	80.67	0.17	16.49	15.17 1677.53
North Main	3 Bridges-Culv	3 Bridges-Culv		10.66	81.13	96.89	0.26	3.35	3.08 1194.55
North Main	4 Fine Grading	4 Fine Grading		11.74	84.92	92.99	0.27	3.46	3.18 608.60
North Main	5 Track-Signal	5 Track-Signal		19.10	44.86	52.98	0.13	8.59	7.90 126.79
Warehouse	1 WhseCon	1 WhseCon		37.13	253.86	282.00	0.88	10.05	9.25 5276.78
Warehouse	2 CivilSitImp	2 CivilSitImp		12.57	104.35	114.99	0.26	4.71	4.33 2923.62
33 KV	1 33KV	1 33KV		37.13	253.86	282.00	0.88	10.05	9.25 4676.17
Solar	1 Solar	1 Solar		1.52	11.31	15.98	0.04	0.45	0.41 96.34
				125.16	919.21	1,011.53	2.86	37.84	34.81

		Pounds/Day				MT/yr			
		2027	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e	
IMF	6 Bldg-Paving		4.05	16.64	39.86	0.10	0.54	0.40	28.57
IMF	7 Track-Signal		9.17	16.57	37.33	0.09	2.45	2.15	5.06
BSY	3 Drainage-Ug		5.58	25.77	47.28	0.14	0.80	0.63	103.24
BSY	4 Bridges-Culv		9.64	37.08	92.41	0.25	1.26	0.89	179.99
BSY	5 Fine Grading		23.61	48.55	250.77	0.58	2.26	1.13	1975.08
BSY	6 Track-Signal		34.56	37.93	80.61	0.17	10.78	9.69	637.46
North Main	3 Bridges-Culv		10.14	40.00	96.27	0.26	1.34	0.96	453.93
North Main	4 Fine Grading		10.91	23.15	92.99	0.27	1.08	0.54	231.27
North Main	5 Track-Signal		19.04	26.59	52.92	0.13	5.63	5.03	48.18
Warehouse	1 WhseCon		35.45	207.62	282.00	0.88	5.75	5.09	2005.18
Warehouse	2 CivilSitImp		10.46	36.38	114.99	0.26	1.29	0.87	1110.98
33 KV	1 33KV		35.45	207.62	282.00	0.88	5.75	5.09	1776.95
Solar	1 Solar		1.47	4.72	15.92	0.04	0.18	0.11	36.61
			115.24	548.00	1,010.23	2.86	16.55	13.34	

		2028	ROG	NOx	CO	SO2	Exhaust PM10	Exhaust PM CO2e	
BSY	5 Track-Signal		34.94	69.77	80.67	0.17	16.49	15.17	1,123.95
North Main	5 Track-Signal		19.10	44.86	52.98	0.13	8.59	7.90	849.46
			54.04	114.64	133.65	0.29	25.08	23.08	

		2028	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e	
BSY	5 Track-Signal		34.56	37.93	80.61	0.17	10.78	9.69	427.10
North Main	5 Track-Signal		19.04	26.59	52.92	0.13	5.63	5.03	322.80
			53.60	64.52	133.52	0.29	16.41	14.72	

BIG Project Annual Construction Emissions*

*Data provided by Kimley-Horn and Associates, Inc. 2025

		Unmitigated Construction						
		Tons/Year				MT/yr		
		2025	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
South Main	1 Demo-SP	0.12	1.01	0.96	0.00	0.04	0.04	264.51
South Main	2 Mass Grading	1.07	8.53	8.43	0.02	0.36	0.33	2305.68
South Main	3 Bridges-Culv	0.23	1.66	2.02	0.01	0.07	0.06	555.22
IMF	1 Demo-SP	0.76	6.32	6.03	0.02	0.26	0.24	1,641.78
IMF	2 Mass Grading	8.92	77.69	71.32	0.18	3.33	3.06	18,126.09
IMF	3 Drainage-Ug	0.80	5.54	6.72	0.02	0.22	0.21	1,968.05
IMF	4 Bridges-Culv	0.35	2.72	3.22	0.01	0.11	0.10	836.10
IMF	5 Fine Grading	0.27	2.14	2.23	0.01	0.09	0.08	557.34
BSY	1 Demo-SP	2.08	17.16	16.33	0.05	0.72	0.66	4,456.60
North Main	1 Demo-SP	0.06	0.51	0.50	0.00	0.02	0.02	139.80
33 KV	1 33KV	0.22	1.59	2.21	0.01	0.06	0.06	587.64
		14.89	124.87	119.97	0.32	5.28	4.86	31438.81

		Mitigated Construction						
		Tons/Year				MT/yr		
		2025	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
		0.12	0.85	0.96	0.00	0.02	0.02	100.51
		0.99	4.81	8.43	0.02	0.16	0.12	876.16
		0.22	0.76	2.01	0.01	0.03	0.02	210.99
		0.71	5.13	6.03	0.02	0.15	0.13	623.88
		8.02	54.06	71.32	0.18	1.64	1.40	6,887.91
		0.79	3.99	6.72	0.02	0.12	0.10	747.86
		0.33	1.27	3.19	0.01	0.04	0.03	317.72
		0.23	0.48	2.23	0.01	0.02	0.01	211.79
		1.94	14.07	16.33	0.05	0.41	0.36	1,693.51
		0.06	0.40	0.50	0.00	0.01	0.01	53.12
		0.22	0.54	2.21	0.01	0.02	0.01	223.30
		13.64	86.37	119.94	0.32	2.63	2.22	11946.75

		Unmitigated Construction						
		Tons/Year				MT/yr		
		2026	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
South Main	2 Mass Grading	1.19	9.48	9.37	0.03	0.40	0.36	2561.86
South Main	3 Bridges-Culv	0.32	2.28	2.78	0.01	0.09	0.08	764.98
South Main	4 Fine Grading	0.18	1.38	1.46	0.00	0.06	0.05	374.33
South Main	5 Track-Signal	0.67	2.98	3.62	0.01	0.25	0.23	969.17
IMF	2 Mass Grading	1.13	9.87	9.06	0.02	0.42	0.39	2,301.73
IMF	3 Drainage-Ug	1.45	10.00	12.12	0.04	0.40	0.37	3,550.20
IMF	4 Bridges-Culv	0.94	7.25	8.58	0.02	0.30	0.28	2,229.60
IMF	5 Fine Grading	1.00	7.99	8.33	0.02	0.34	0.31	2,080.74
IMF	6 Bldg-Paving	0.64	5.03	5.97	0.02	0.20	0.19	1,478.77
IMF	7 Track-Signal	1.26	4.25	5.06	0.01	0.54	0.50	1,201.82
BSY	2 Mass Grading	26.42	233.20	211.59	0.54	10.02	9.22	53,104.92
BSY	3 Drainage-Ug	0.56	3.80	4.70	0.01	0.15	0.14	1,386.29
BSY	4 Bridges-Culv	1.02	7.77	9.26	0.02	0.32	0.30	2,416.87
BSY	5 Fine Grading	1.86	15.86	15.92	0.04	0.71	0.65	3,607.06
North Main	2 Mass Grading	1.20	9.81	9.52	0.03	0.41	0.38	2,547.93
Warehouse	1 WhseCon	2.80	19.17	21.29	0.07	0.76	0.70	6,478.00
33 KV	1 33KV	5.81	39.73	44.13	0.14	1.57	1.45	13,427.91
Solar	1 Solar	0.19	1.39	1.97	0.00	0.06	0.05	474.00
		48.63	391.22	384.74	1.03	17.02	15.65	100,956.18

		Mitigated Construction						
		Tons/Year				MT/yr		
		2026	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
		1.10	5.34	9.37	0.03	0.18	0.14	973.51
		0.31	1.05	2.77	0.01	0.04	0.03	290.69
		0.15	0.32	1.46	0.00	0.02	0.01	142.25
		0.66	1.47	3.60	0.01	0.14	0.12	368.28
		1.02	6.86	9.06	0.02	0.21	0.18	874.66
		1.43	7.19	12.12	0.04	0.22	0.18	1,349.08
		0.89	3.39	8.52	0.02	0.12	0.08	847.25
		0.86	1.79	8.33	0.02	0.08	0.04	790.68
		0.60	2.45	5.88	0.02	0.08	0.06	561.93
		1.24	2.25	5.06	0.01	0.33	0.29	456.69
		23.61	165.59	211.59	0.54	4.98	4.31	20,179.87
		0.56	2.56	4.70	0.01	0.08	0.06	526.79
		0.96	3.69	9.19	0.02	0.13	0.09	918.41
		1.50	3.08	15.92	0.04	0.14	0.07	1,370.68
		1.10	5.60	9.52	0.03	0.19	0.14	968.21
		2.68	15.68	21.29	0.07	0.43	0.38	2,461.64
		5.55	32.49	44.13	0.14	0.90	0.80	5,102.61
		0.18	0.58	1.96	0.00	0.02	0.01	180.12
		44.39	261.41	384.48	1.03	8.28	6.99	38,363.35

		Unmitigated Construction						
		Tons/Year				MT/yr		
		2027	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
IMF	6 Bldg-Paving	0.03	0.26	0.30	0.00	0.01	0.01	75.19
IMF	7 Track-Signal	0.01	0.05	0.06	0.00	0.01	0.01	13.30
BSY	3 Drainage-Ug	0.11	0.74	0.92	0.00	0.03	0.03	271.68
BSY	4 Bridges-Culv	0.20	1.52	1.81	0.00	0.06	0.06	473.66
BSY	5 Fine Grading	2.67	22.86	22.95	0.05	1.02	0.94	5,197.57
BSY	6 Track-Signal	3.49	6.98	8.07	0.02	1.65	1.52	1,677.53
North Main	3 Bridges-Culv	0.50	3.81	4.55	0.01	0.16	0.14	1,194.55
North Main	4 Fine Grading	0.27	1.95	2.14	0.01	0.08	0.07	608.60
North Main	5 Track-Signal	0.19	0.45	0.53	0.00	0.09	0.08	126.79
Warehouse	1 WhseCon	2.28	15.61	17.34	0.05	0.62	0.57	5,276.78
Warehouse	2 CivilSiteImp	1.42	11.79	12.99	0.03	0.53	0.49	2,923.62
33 KV	1 33KV	2.02	13.84	15.37	0.05	0.55	0.50	4,676.17
Solar	1 Solar	0.04	0.28	0.40	0.00	0.01	0.01	96.34
		13.25	80.14	87.44	0.23	4.81	4.43	22,611.80

		Mitigated Construction						
		Tons/Year				MT/yr		
		2027	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
		0.03	0.12	0.30	0.00	0.00	0.00	28.57
		0.01	0.02	0.06	0.00	0.00	0.00	5.06
		0.11	0.50	0.92	0.00	0.02	0.01	103.24
		0.19	0.72	1.80	0.00	0.02	0.02	179.99
		2.16	4.44	22.95	0.05	0.21	0.10	1,975.08
		3.46	3.79	8.06	0.02	1.08	0.97	637.46
		0.48	1.88	4.52	0.01	0.06	0.05	453.93
		0.25	0.53	2.14	0.01	0.02	0.01	231.27
		0.19	0.27	0.53	0.00	0.06	0.05	48.18
		2.18	12.77	17.34	0.05	0.35	0.31	2,005.18
		1.18	4.11	12.99	0.03	0.15	0.10	1,110.98
		1.93	11.32	15.37	0.05	0.31	0.28	1,776.95
		0.04	0.12	0.40	0.00	0.00	0.00	36.61
		12.21	40.60	87.38	0.23	2.29	1.91	8,592.48

		Unmitigated Construction						
		Tons/Year				MT/yr		
		2028	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
BSY	5 Track-Signal	2.34	4.67	5.40	0.01	1.10	1.02	1,123.95
North Main	5 Track-Signal	1.28	3.01	3.55	0.01	0.58	0.53	849.46
		3.62	7.68	8.95	0.02	1.68	1.55	1,973.41

		Mitigated Construction						
		Tons/Year				MT/yr		
		2028	ROG	NOx	CO	SO2	Exhaust PM	Exhaust PM CO2e
		2.32	2.54	5.40	0.01	0.72	0.65	427.10
		1.28	1.78	3.55	0.01	0.38	0.34	322.80
		3.59	4.32	8.95	0.02	1.10	0.99	749.90

13. BIG Electricity Demand/Emissions

This page intentionally left blank.

BIG Non-Residential Electricity Consumption

*Data provided by Kimley-Horn and Associates, Inc. 2025

provided by Kimley-Horn and Associates, Inc. 2025

	MWh/day	MWh/year	CO ₂ e Emissions (MT/Year)		
			2028	2033	2048
IMF-W					
Yard Hostlers*	0	0	0	0	0
Yard Loads	9	3,201	613	479	0
Lighting	18	6,666	1,277	998	0
Widespan Cranes	17	6,182	1,184	926	0
Misc Charging	0.3	95	18	14	0
IMF-E2					
				0	
Railroad Buildings	12	4,429	848	663	0
Widespan Cranes	11	4,135	792	619	0
Misc Yard Loads	14	5,162	989	773	0
	0.2	60	11	9	0
IMF-E3					
				0	
Yard Hostlers	15	5,523	1,058	827	0
Fleet Vehicle Charging	1	195	37	29	0
Employee Vehicle Charging	4	1,370	262	205	0
Drayage Hostlers	23	8,330	1,595	1,248	0
Misc Charging	2	670	128	100	0
Transload Warehouses					
				0	
HVAC & Utilities	164	59,711	11,437	8,944	0
Exterior Lighting	21	7,712	1,477	1,155	0
Forklifts	35	12,908	2,472	1,933	0
Employee Vehicle Charging	49	17,848	3,418	2,673	0
Drayage Truck Charging	3	1,061	203	159	0
* hostlers would be charged at IMF-E3					
Total IMF	126	46,018	8,814	6,893	0
Total Transload Buildings	272	99,240	19,008	14,864	0
BIG Total	398	145,258	27,822	21,757	0
Solar Generation (East Area Ground Mounted)					
		-49,200	-9,423	-7,369	0
Net With Ground Mounted Solar		96,058	18,398	14,388	0
Warehouse Rooftop Solar (Req'd per Code)		11,680	-2,237	-1,749	0
Warehouse Rooftop Solar (Mitigation)		31,025	-5,942	-4,647	0

Source: Electrical Load Summary provided by 1898 & Co. March 20, 2025.
Energy consumption includes lighting, building energy, and equipment charging.
Transload parking assumes 4.5 million square feet at 0.876 kWh/sf/year.

Electricity Consumption Rates

	Annual Energy Use	
	kWh/sq ft	kWh/KSF
Parking (Lighting)	0.876	0.000876

Source: CalEEMod 2022 Users Guide, Appendix D6, Page D-21.

SCE Electricity Intensity Factor

CO ₂ e (Metric Tons/MWh)		
2028	2033	2048
0.192	0.150	0.000

Source: CEC Annual Power Content Label

Rooftop Solar MW Provided:	MWDC
Required by Code	6.4
Additional Required per Mitigation	17

14. BIG Rail Emissions

This page intentionally left blank.

BIG Rail: Criteria Air Pollutant Emissions

Proposed Project - Horizon Year 2048 (MDAB)¹

Scenario	Daily Emissions (pounds per day)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mainline	29.76061	963.8163	298.3641	1.060435	17.19648	16.68059
Captive Fleet	1.618351	38.60689	49.32982	0.175326	0.573772	0.556559
<i>Mainline Subtotal</i>	<i>31.37897</i>	<i>1002.423</i>	<i>347.6939</i>	<i>1.235761</i>	<i>17.77025</i>	<i>17.23715</i>
BIG Lead Tracks	9.251561	295.1192	103.5392	0.367995	5.228046	5.071204
BIG Block Swap Yard	25.05418	560.9131	110.0857	0.389755	15.55612	15.08944
BIG Intermodal Facility	0.685984	22.21601	6.877307	0.024443	0.39638	0.384488
BIG Maintenance	4.647433	34.45655	5.483289	0.018662	1.236212	1.199126
<i>Other Subtotal</i>	<i>39.63915</i>	<i>912.7048</i>	<i>225.9855</i>	<i>0.800856</i>	<i>22.41676</i>	<i>21.74426</i>
Corridor With BIG ²	2015.2	56,780.00	17703.5	63	1011.5	981.2
Total	2086.218	58695.13	18277.18	65.03662	1051.687	1020.181
Corridor Without BIG ²	1919.2	53860.5	16699.5	58.9	968.9	939.9
Net Total	167.0181	4834.628	1577.679	6.136617	82.78702	80.28141

Scenario	Annual Emissions (tons per year)					
	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}
Mainline	4.806471	155.6606	48.18712	0.171265	2.777308	2.693989
Captive Fleet	0.261371	6.235184	7.966984	0.028316	0.092667	0.089887
<i>Mainline Subtotal</i>	<i>5.067842</i>	<i>161.8958</i>	<i>56.15411</i>	<i>0.199581</i>	<i>2.869975</i>	<i>2.783876</i>
BIG Lead Tracks	1.494168	47.66306	16.72204	0.059433	0.844353	0.819022
BIG Block Swap Yard	4.046361	90.58995	17.77933	0.062947	2.512383	2.437012
BIG Intermodal Facility	0.125192	4.079101	1.264975	0.004461	0.073456	0.071252
BIG Maintenance	0.750581	5.564886	0.885576	0.003014	0.199654	0.193664
<i>Other Subtotal</i>	<i>6.416302</i>	<i>147.897</i>	<i>36.65192</i>	<i>0.129855</i>	<i>3.629845</i>	<i>3.52095</i>
Corridor With BIG ²	325.5	9170.2	2895.2	10.2	163.4	158.5
Total	336.9841	9479.993	2988.006	10.52944	169.8998	164.8048
Corridor Without BIG ²	310	8698.7	2697	9.5	156.5	151.8
Net Total	26.98414	781.2928	291.006	1.029436	13.39982	13.00483

¹ Data provided by Kimley-Horn and Associates, Inc. 2025

² Ensafe. 2025, October. BNSF Barstow International Gateway Corridor Emissions Analysis.

BIG Rail: GHG Emissions (California)

Proposed Project - Horizon Year 2048¹

Scenario	Annual Emissions (MTCO ₂ e/yr)			
	CO ₂	N ₂ O	CH ₄	CO ₂ e
Mainline	16,372.0747	0.4303	1.3239	16,533.3878
Captive Fleet	2,706.8655	0.0711	0.2189	2,733.5361
<i>Mainline Subtotal</i>	<i>19078.94013</i>	<i>0.501393</i>	<i>1.542747</i>	<i>19,266.9239</i>
BIG Lead Tracks	4799.398908	0.126128	0.388085	4846.687115
BIG Block Swap Yard	6112.140287	0.158138	0.486578	6171.429786
BIG Intermodal Facility	440.0785846	0.011207	0.034482	444.280236
BIG Maintenance	295.8276841	0.007572	0.023298	298.666545
<i>Other Subtotal</i>	<i>11647.44546</i>	<i>0.303044</i>	<i>0.932443</i>	<i>11761.06368</i>
Corridor With BIG (MDAB) ²	968659	24.7	75.9	977937.5
Corridor With BIG (SoCAB) ²	237679.4	6.1	18.6	239948.7
<i>Other Subtotal</i>	<i>1206338.4</i>	<i>30.8</i>	<i>94.5</i>	<i>1217886.2</i>
Total	1237064.786	31.60444	96.97519	1248914.188
Mainline - Without BIG	28774.72399	0.756197	2.32676	29058.23972
Corridor Without BIG (MDAB) ²	935859.3	23.8	73.3	944794.4
Corridor Without BIG (SoCAB) ²	211988.8	5.4	16.6	214012.8
Net Total	60441.96161	1.64824	4.74843	61048.74781

¹ Data provided by Kimley-Horn and Associates, Inc. 2025

² Ensafe. 2025, October. BNSF Barstow International Gateway Corridor Emissions Analysis.

15. TMT Emissions Reductions

This page intentionally left blank.

Mobile Source Emissions Summary - Truck Miles Traveled Reduction (MDAB Only)*

*Data provided by Kimley-Horn and Associates, Inc. 2025

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2028 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TW	-0.20	-21.84	-5.21	-0.21	-2.29	-1.00	-0.95	-0.66	-3.33	-20,961.96	-21,971.03
		Dust					-11.26	-2.76					
		Annual Total	-0.20	-21.84	-5.21	-0.21	-13.55	-3.77	-0.95	-0.66	-3.33	-20,961.96	-21,971.03
2028 Summer (Pounds/Day)	Trucks	Exhaust & BW/TW	-1.10	-119.64	-28.54	-1.16	-12.54	-5.50	-5.20				
		Dust					-61.72	-15.15					
		Summer Total	-1.10	-119.64	-28.54	-1.16	-74.25	-20.64	-5.20				
2028 Winter (Pounds/Day)	Trucks	Exhaust & BW/TW	-1.10	-125.16	-28.53	-1.16	-12.54	-5.50	-5.20				
		Dust					-61.72	-15.15					
		Winter Total	-1.10	-125.16	-28.53	-1.16	-74.25	-20.64	-5.20				
			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2033 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TW	-0.21	-22.75	-4.92	-0.23	-2.78	-1.20	-0.87	-0.57	-3.60	-22,648.39	-23,735.12
		Dust					-11.26	-2.76					
		Annual Total	-0.21	-22.75	-4.92	-0.23	-14.04	-3.96	-0.87	-0.57	-3.60	-22,648.39	-23,735.12
2033 Summer (Pounds/Day)	Trucks	Exhaust & BW/TW	-1.16	-124.64	-26.99	-1.26	-15.21	-6.57	-4.76				
		Dust					-61.72	-15.15					
		Summer Total	-1.16	-124.64	-26.99	-1.26	-76.93	-21.72	-4.76				
2033 Winter (Pounds/Day)	Trucks	Exhaust & BW/TW	-1.16	-130.44	-26.98	-1.26	-15.21	-6.57	-4.76				
		Dust					-61.72	-15.15					
		Winter Total	-1.16	-130.44	-26.98	-1.26	-76.93	-21.72	-4.76				
			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2048 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TW	-0.21	-22.27	-2.98	-0.24	-3.23	-1.37	-0.58	-0.31	-3.65	-23,060.74	-24,157.40
		Dust					-16.56	-4.07					
		Annual Total	-0.21	-22.27	-2.98	-0.24	-19.79	-5.43	-0.58	-0.31	-3.65	-23,060.74	-24,157.40
2048 Summer (Pounds/Day)	Trucks	Exhaust & BW/TW	-1.16	-122.01	-16.33	-1.29	-17.69	-7.49	-3.18				
		Dust					-90.76	-22.28					
		Summer Total	-1.16	-122.01	-16.33	-1.29	-108.45	-29.77	-3.18				
2048 Winter (Pounds/Day)	Trucks	Exhaust & BW/TW	-1.16	-127.90	-16.33	-1.29	-17.69	-7.49	-3.18				
		Dust					-90.76	-22.28					
		Winter Total	-1.16	-127.90	-16.33	-1.29	-108.45	-29.77	-3.18				

							MT/Year
Tons/Year	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂ e
2028 Trucks	-0.20	-21.84	-5.21	-0.21	-13.55	-3.77	-21,971.03
2033 Trucks	-0.21	-22.75	-4.92	-0.23	-14.04	-3.96	-23,735.12
2048 Trucks	-0.21	-22.27	-2.98	-0.24	-19.79	-5.43	-24,157.40
Pounds/Day	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	
2028 Trucks	-1.10	-119.64	-28.53	-1.16	-74.25	-20.64	
2033 Trucks	-1.16	-124.64	-26.98	-1.26	-76.93	-21.72	
2048 Trucks	-1.16	-122.01	-16.33	-1.29	-108.45	-29.77	

Overall Total													
					Tons/Year				MT/Year				
			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2028 Annual			-0.20	-21.84	-5.21	-0.21	-13.55	-3.77	-0.95	-0.66	-3.33	-20,961.96	-21,971.03
2033 Annual			-0.21	-22.75	-4.92	-0.23	-14.04	-3.96	-0.87	-0.57	-3.60	-22,648.39	-23,735.12
2048 Annual			-0.21	-22.27	-2.98	-0.24	-19.79	-5.43	-0.58	-0.31	-3.65	-23,060.74	-24,157.40
Pounds/Day													
2028 Summer			-1.10	-119.64	-28.54	-1.16	-74.25	-20.64	-5.20				
2028 Winter			-1.10	-125.16	-28.53	-1.16	-74.25	-20.64	-5.20				
2028 Daily Max			-1.10	-119.64	-28.53	-1.16	-74.25	-20.64	-5.20				
2033 Summer			-1.16	-124.64	-26.99	-1.26	-76.93	-21.72	-4.76				
2033 Winter			-1.16	-130.44	-26.98	-1.26	-76.93	-21.72	-4.76				
2033 Daily Max			-1.16	-124.64	-26.98	-1.26	-76.93	-21.72	-4.76				
2048 Summer			-1.16	-122.01	-16.33	-1.29	-108.45	-29.77	-3.18				
2048 Winter			-1.16	-127.90	-16.33	-1.29	-108.45	-29.77	-3.18				
2048 Daily Max			-1.16	-122.01	-16.33	-1.29	-108.45	-29.77	-3.18				

Mobile Source Emissions Summary - Truck Miles Traveled Reduction (CA Only)

*Data provided by Kimley-Horn and Associates, Inc. 2025

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2028 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TV	-1.09	-91.60	-25.20	-0.84	-9.04	-3.96	-4.18	-2.69	-13.25	-83,401.17	-87,417.93
		Dust					-44.48	-10.92					
		Annual Total	-1.09	-91.60	-25.20	-0.84	-53.52	-14.88	-4.18	-2.69	-13.25	-83,401.17	-87,417.93

2028 Summer (Pounds/Day)	Trucks	Exhaust & BW/TV	-6.09	-501.90	-137.83	-4.63	-49.51	-21.71	-22.99
		Dust					-243.74	-59.83	
		Summer Total	-6.09	-501.90	-137.83	-4.63	-293.25	-81.54	-22.99

2028 Winter (Pounds/Day)	Trucks	Exhaust & BW/TV	-5.86	-525.71	-138.54	-4.63	-49.51	-21.71	-22.73
		Dust					-243.74	-59.83	
		Winter Total	-5.86	-525.71	-138.54	-4.63	-293.25	-81.54	-22.73

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2033 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TV	-1.27	-102.58	-26.71	-0.98	-11.73	-5.07	-4.20	-2.53	-15.33	-96,457.44	-101,088.17
		Dust					-58.43	-14.34					
		Annual Total	-1.27	-102.58	-26.71	-0.98	-70.17	-19.42	-4.20	-2.53	-15.33	-96,457.44	-101,088.17

2033 Summer (Pounds/Day)	Trucks	Exhaust & BW/TV	-7.11	-562.06	-145.98	-5.35	-64.30	-27.80	-23.15
		Dust					-320.19	-78.59	
		Summer Total	-7.11	-562.06	-145.98	-5.35	-384.49	-106.39	-23.15

2033 Winter (Pounds/Day)	Trucks	Exhaust & BW/TV	-6.82	-589.09	-146.89	-5.36	-64.30	-27.80	-22.82	
		Dust						-320.19	-78.59	
		Winter Total	-6.82	-589.09	-146.89	-5.36	-384.49	-106.39	-22.82	

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2048 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TV	-1.30	-98.54	-18.82	-0.98	-13.33	-5.65	-2.95	-1.38	-15.21	-95,972.71	-100,538.73
		Dust					-68.39	-16.79					
		Annual Total	-1.30	-98.54	-18.82	-0.98	-81.73	-22.43	-2.95	-1.38	-15.21	-95,972.71	-100,538.73

2048 Summer (Pounds/Day)	Trucks	Exhaust & BW/TV	-7.27	-539.94	-102.68	-5.38	-73.07	-30.94	-16.32	
		Dust						-374.77	-91.99	
		Summer Total	-7.27	-539.94	-102.68	-5.38	-447.83	-122.92	-16.32	

2048 Winter (Pounds/Day)	Trucks	Exhaust & BW/TV	-6.94	-567.02	-103.72	-5.38	-73.07	-30.94	-15.95
		Dust						-374.77	-91.99
		Winter Total	-6.94	-567.02	-103.72	-5.38	-447.83	-122.93	-15.95

													MT/Year
Tons/Year			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}					CO ₂ e
2028 Trucks			-1.09	-91.60	-25.20	-0.84	-53.52	-14.88					-87,417.93
2033 Trucks			-1.27	-102.58	-26.71	-0.98	-70.17	-19.42					-101,088.17
2048 Trucks			-1.30	-98.54	-18.82	-0.98	-81.73	-22.43					-100,538.73
Pounds/Day			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}					
2028 Trucks			-5.86	-501.90	-137.83	-4.63	-293.25	-81.54					
2033 Trucks			-6.82	-562.06	-145.98	-5.35	-384.49	-106.39					
2048 Trucks			-6.94	-539.94	-102.68	-5.38	-447.83	-122.92					

Overall Total													
			Tons/Year					MT/Year					
			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2028 Annual			-1.09	-91.60	-25.20	-0.84	-53.52	-14.88	-4.18	-2.69	-13.25	-83,401.17	-87,417.93
2033 Annual			-1.27	-102.58	-26.71	-0.98	-70.17	-19.42	-4.20	-2.53	-15.33	-96,457.44	-101,088.17
2048 Annual			-1.30	-98.54	-18.82	-0.98	-81.73	-22.43	-2.95	-1.38	-15.21	-95,972.71	-100,538.73
			Pounds/Day										
2028 Summer			-6.09	-501.90	-137.83	-4.63	-293.25	-81.54	-22.99				
2028 Winter			-5.86	-525.71	-138.54	-4.63	-293.25	-81.54	-22.73				
2028 Daily Max			-5.86	-501.90	-137.83	-4.63	-293.25	-81.54	-22.73				
2033 Summer			-7.11	-562.06	-145.98	-5.35	-384.49	-106.39	-23.15				
2033 Winter			-6.82	-589.09	-146.89	-5.36	-384.49	-106.39	-22.82				
2033 Daily Max			-6.82	-562.06	-145.98	-5.35	-384.49	-106.39	-22.82				
2048 Summer			-7.27	-539.94	-102.68	-5.38	-447.83	-122.92	-16.32				
2048 Winter			-6.94	-567.02	-103.72	-5.38	-447.83	-122.93	-15.95				
2048 Daily Max			-6.94	-539.94	-102.68	-5.38	-447.83	-122.92	-15.95				

Barstow Yard Switcher Replacement Emission Reductions*

*Data provided by Kimley-Horn and Associates, Inc. 2025

		No Renewable Diesel						With Renewable Diesel													
		VOC	NO _x	Pollutant (Tons per Year)			GHG (Metric Tons per Year)			VOC	NO _x	Pollutant (Tons per Year)			GHG (Metric Tons per Year)						
		CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	N ₂ O	CH ₄	CO ₂ e	CO	SO ₂	PM ₁₀	PM _{2.5}	CO ₂	N ₂ O	CH ₄	CO ₂ e				
2028																					
2028 - 15 Switchers, No Replacements, No RD 2028 - 6 Switchers Replaced, 9 Removed, No RD 2028 Reduction with 6 Switchers Replaced, 9 Removed, No RD		24.59	155.92	16.08	0.08	7.26	7.04	765.74	0.19	0.60	839	24.59	155.92	16.08	0.08	7.26	7.04	765.74	0.19	0.60	839
		0.75	6.13	6.43	0.03	0.13	0.13	306.29	0.08	0.24	336	0.74	6.06	6.33	0.03	0.13	0.12	287.30	0.08	0.24	317
		-23.83	-149.79	-9.65	-0.05	-7.13	-6.91	-459.44	-0.12	-0.36	-503	-23.85	-149.86	-9.75	-0.05	-7.13	-6.92	-478.43	-0.12	-0.36	-522
	lbs/day	-130.60	-820.76	-52.88	-0.26	-39.06	-37.89					-130.69	-821.16	-53.43	-0.26	-39.08	-37.91				
	2033																				
2033 - 15 Switchers, No Replacements, No RD 2033 - 6 Switchers Replaced, 9 Removed, No RD 2033 Reduction with 6 Switchers Replaced, 9 Removed, No RD		24.59	155.92	16.08	0.08	7.26	7.04	765.74	0.19	0.60	839	24.59	155.92	16.08	0.08	7.26	7.04	765.74	0.19	0.60	839
		0.75	6.13	6.43	0.03	0.13	0.13	306.29	0.08	0.24	336	0.74	6.06	6.33	0.03	0.13	0.12	287.30	0.08	0.24	317
		-23.83	-149.79	-9.65	-0.05	-7.13	-6.91	-459.44	-0.12	-0.36	-503	-23.85	-149.86	-9.75	-0.05	-7.13	-6.92	-478.43	-0.12	-0.36	-522
	lbs/day	-130.60	-820.76	-52.88	-0.26	-39.06	-37.89					-130.69	-821.16	-53.43	-0.26	-39.08	-37.91				
	2048																				
2048 - 15 Switchers, No Replacements, No RD 2048 - 6 Switchers Replaced, 9 Removed, No RD 2048 Reduction with 6 Switchers Replaced, 9 Removed, No RD		24.59	155.92	16.08	0.08	7.26	7.04	765.74	0.19	0.60	839	24.59	155.92	16.08	0.08	7.26	7.04	765.74	0.19	0.60	839
		0.75	6.13	6.43	0.03	0.13	0.13	306.29	0.08	0.24	336	0.74	6.06	6.33	0.03	0.13	0.12	287.30	0.08	0.24	317
		-23.83	-149.79	-9.65	-0.05	-7.13	-6.91	-459.44	-0.12	-0.36	-503	-23.85	-149.86	-9.75	-0.05	-7.13	-6.92	-478.43	-0.12	-0.36	-522
	lbs/day	-130.60	-820.76	-52.88	-0.26	-39.06	-37.89					-130.69	-821.16	-53.43	-0.26	-39.08	-37.91				

1 ton = 0.9071847 metric tons

RD Reductions									
Year	Pct RD	VOC	NOx	CO	SO2	PM10	PM2.5	CO2	
2028	10%	2.16%	1.21%	1.56%	0.00%	3.04%	3.04%	6.20%	
2033	10%	2.16%	1.21%	1.56%	0.00%	3.04%	3.04%	6.20%	
2048	10%	2.16%	1.21%	1.56%	0.00%	3.04%	3.04%	6.20%	
*RD for EB trains fueled in CA only									

Percent Reduction from EPA Cert Diesel (%)							
	HC	NOx	CO	SO2	PM	PM2.5	CO2
B5 - Hybrid	0.0%	0.0%	0.0%	0%	0.0%	0.0%	3.1%
R20 -Hybrid	4.3%	2.4%	3.1%	0%	6.1%	6.1%	12.4%
R30 - Hybrid	6.5%	3.6%	4.7%	0%	9.1%	9.1%	18.6%
R100 - Hybrid	21.6%	12.1%	15.6%	0%	30.4%	30.4%	62.0%

Carbon Intensity Reduction for RD100 of 62% based on RD CI of 38.05 and conventional diesel CI of 100.45 (CARB, 2024)

16. General Plan Emissions (U.S.)

This page intentionally left blank.

CITY OF BARSTOW GENERAL PLAN PLANNING AREA - COMMUNITY GHG EMISSIONS INVENTORY (In U.S.)

	MTCO ₂ e			
SECTORS	2023	Percent of Total	2048	Percent of Total
Transportation - On-Road (City, BIG, & SOI) ¹	232,465	71%	300,266	82%
Residential (Natural Gas and Electricity) ²	34,168	10%	31,486	9%
Nonresidential* (Natural Gas and Electricity) ²	28,532	9%	21,229	6%
Solid Waste (Waste Commitment) - City, BIG. & SOI ³	8,984	3%	17,958	5%
Water/Wastewater (Entire General Plan Plan Area) ⁴	1,772	1%	570	0%
Other - Offroad Equipment (City & SOI) ⁵	4,732	1%	3,360	1%
Refrigerants ⁶	15,460	5%	23,812	6%
<i>Community Subtotal</i>	<i>326,114</i>	<i>100%</i>	<i>398,681</i>	<i>108%</i>
Big: Nonresidential (Electricity, No Natural Gas)	n/a	n/a	0	
BIG: Other - Offroad Equipment (Excludes landscaping equipment)	n/a	n/a	53,715	
BIG: Landscaping Equipment	n/a		21	
BIG: Construction (30-year amortized)	n/a	n/a	7,808	
Rail	n/a	n/a	240,500	
BIG: Refrigerants	n/a	n/a	40,372	
<i>BIG Subtotal</i>	<i>n/a</i>	<i>n/a</i>	<i>342,416</i>	
Existing Barstow Yard Switcher Replacement	n/a	n/a	(522)	
TMT Reduction - National + Regional	n/a	n/a	(372,416)	
<i>BIG Net Subtotal</i>	<i>n/a</i>	<i>n/a</i>	<i>(30,522)</i>	<i>-8%</i>
Total Community+BIG Project Emissions	326,114	100%	368,159	100%
Service Population	48,626		78,068	
MTCO ₂ e/SP	6.71		4.72	
Trajectory to AB 32, SB 32 and AB 1279	48,917	85.00%	No	<-Achieve Target?

Notes: Based on IPCC's Fifth Assessment Report GWPs

¹ Existing and year 2028 emissions based on calendar year 2023 and 2048 EMFAC2021, Version 1.0.2, emissions data, respectively, and vehicle miles traveled (VMT) data provided by Fehr&Peers. VMT data provided by Fehr & Peers using the San Bernardino Transportation Analysis Model (SBTAM+) and origin-destination approach. The VMT provided includes the full trip length for land uses in the City and SOI (origin-destination approach) and a 50 percent reduction in the trip length for external-internal/internal-external trips, consistent with the recommendations of CARB’s Regional Targets Advisory Committee. Daily VMT from the SBTAM+ is converted to annual VMT by multiplying the daily VMT by 347 days per year, which is consistent with CARB assumptions to account for less travel on weekend.

² Based on natural gas usage data provided by Southwest Gas and intensity factors for CO₂, CH₄, and NO₂ from the California Emissions Estimator Model, Version 2022.1, for natural gas and on electricity usage data provided by Southern California Edison and a CO₂e intensity factor of 374 lbs/MWh as reported in the SCE 2023 Sustainability Report. Forecast emissions based on a household growth adjustment factor for residential natural gas and electricity demand and a building square footage growth adjustment factor for nonresidential natural gas and electricity usage.

³ Waste. Landfill Emissions Tool Version 1.9 and CalRecycle. Waste generation based on four-year average (2020-2023) waste commitment for the City of Barstow obtained from CalRecycle and adjusted to include solid waste from the SOI. Assumes 75 percent of fugitive GHG emissions are captured within the landfill's Landfill Gas Capture System with a landfill gas capture efficiency of 75%. Emissions results of the Landfill Emissions Tool v.1.9, which are based on AR4 GWPs, are adjusted to be based on AR5 GWPs. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.1. Significant CH₄ production typically begins one or two years after waste disposal in a landfill and continues for 10 to 60 years or longer. Consequently, the highest CH₄ emissions from waste disposal in a given year are reported and have been adjusted to utilize IPCC's Fourth Assessment global warming potential assigned for CH₄.

⁴ GHG emissions from this sector include indirect GHG emissions from the embodied energy associated with water use and wastewater generation and fugitive GHG emissions from processing wastewater. Water demand and wastewater generation is based on data provided by the Mojave Water Agency and City of Barstow (see Section 5.17, *Utilities and Service Systems*). Electricity use from water use is estimated using energy rates identified by in the 2022 CalEEMod Users Guide (CAPCOA 2022). Then energy is multiplied by the carbon intensity of energy. Wastewater treatment also results in direct CH₄ emissions from wastewater processing, which are based on the emission rates identified in the 2022 CalEEMod Users Guide

⁵ Based on OFFROAD, Version 1.1.0, calendar year 2023 and year 2048 emissions data.

⁶ Refrigerants are based on the CARB’s statewide 2021 refrigerant use and statewide population based on the 2021 census data in order to derive emissions per person. The CARB statewide 2021 refrigerant use CO₂e emissions, which are based on AR4 GWPs, were adjusted to AR5 GWPs.

Industrial Sector are "point" sources that are permitted by MDAQMD and are not under the jurisdiction of the City of Barstow; and therefore, not included in the City of Barstow's community GHG emissions inventory.

CITY OF BARSTOW+SOI - GHG EMISSIONS INVENTORY COMPARISON

	Substantial Increase			
	Change from 2023 MTCO ₂ e			
SECTORS	Year 2023	Horizon Year 2048	2048 Buildout	Percent Change from 2023
Transportation - On-Road	232,465	300,266	67,801	29%
Residential (Natural Gas and Electricity)	34,168	31,486	(2,682)	-7.8%
Nonresidential* (Natural Gas and Electricity)	28,532	21,229	(7,303)	-25.6%
Waste	8,984	17,958	8,974	99.9%
Water/Wastewater	1,772	570	(1,202)	-67.8%
Other - Offroad Equipment	4,732	3,360	(1,372)	-29.0%
Refrigerants	15,460	23,812	8,352	54.0%
Rail			(30,522)	
Total Community Emissions	326,114	398,681	42,045	13%

BIG Rail: GHG Emissions (California + National)

Proposed Project - Horizon Year 2048¹

Scenario	Annual Emissions (MTCO ₂ e/yr)			
	CO ₂	N ₂ O	CH ₄	CO ₂ e
Mainline	16,372.0747	0.4303	1.3239	16,533.3878
Captive Fleet	2,706.8655	0.0711	0.2189	2,733.5361
<i>Mainline Subtotal</i>	<i>19078.94013</i>	<i>0.501393</i>	<i>1.542747</i>	<i>19,266.9239</i>
BIG Lead Tracks	4799.398908	0.126128	0.388085	4846.687115
BIG Block Swap Yard	6112.140287	0.158138	0.486578	6171.429786
BIG Intermodal Facility	440.0785846	0.011207	0.034482	444.280236
BIG Maintenance	295.8276841	0.007572	0.023298	298.666545
<i>Other Subtotal</i>	<i>11647.44546</i>	<i>0.303044</i>	<i>0.932443</i>	<i>11761.06368</i>
Corridor With BIG (MDAB) ²	968659	24.7	75.9	977937.5
Corridor With BIG (SoCAB) ²	237679.4	6.1	18.6	239948.7
Corridor Outside California	177,421	5	17	179,451
<i>Other Subtotal</i>	<i>1,383,759</i>	<i>36</i>	<i>111</i>	<i>1,397,337</i>
Total	1,414,486	37.01889	113.6351	1428365.099
Mainline - Without BIG	28774.72399	0.756197	2.32676	29058.23972
Corridor Without BIG (MDAB) ²	935859.3	23.8	73.3	944794.4
Corridor Without BIG (SoCAB) ²	211988.8	5.4	16.6	214012.8
Net Total	237862.8682	7.062696	21.4083	240499.6591

¹ Data provided by Kimley-Horn and Associates, Inc. 2025

² Ensafe. 2025, October. BNSF Barstow International Gateway Corridor Emissions Analysis.

Corridor Emissions Outside of California

¹ Data provided by Kimley-Horn and Associates, Inc. 2025

With BIG RD Blend:	10%
No BIG RD Blend EB to Belen:	1.0%
WB/East of Belen:	0%

	2028	2033	2048
BIG Total Mitigated Const and Ops Emissions (MTCO ₂ e/year)	0	0	0
Corridor Emissions Outside of CA (MTCO ₂ e/year)	115,529	157,860	179,451
	115,529	157,860	179,451

Tier	Line Haul Fleet Mix (%)		
	2028	2033	2048
Uncontrolled	0.00%	0.00%	0.00%
Tier 0	0.00%	0.00%	0.00%
Tier 0+	0.00%	0.00%	0.00%
Tier 1	0.00%	0.00%	0.00%
Tier 1+	23.72%	17.48%	8.67%
Tier 2	0.00%	0.00%	0.00%
Tier 2+	37.18%	37.54%	38.04%
Tier 3	28.03%	28.30%	28.68%
Tier 4	11.07%	16.68%	24.61%

	Gallons/Year			RD %
	2028	2033	2048	
1% RD EB CA to Belen No Project	39,283,768	42,658,430	55,515,941	1%
10% RD EB CA to Belen With Project	42,933,775	47,555,329	61,159,043	10%
EB 0% RD East of Belen - Phoenix	4,168,535	5,476,466	6,358,007	0%
WB 0% RD Total Distance - Phoenix	5,785,147	7,600,310	8,823,724	0%

2028 Emissions

		VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO _x	CO ₂	N ₂ O	CH ₄	CO ₂ e
Annual	Gallons/Yr	Tons/Year									
1% RD EB CA to Belen No Project	39,283,768	149.53	4,433.32	1,151.10	90.94	88.21	4.07	439,382	11.26	34.64	443,603
10% RD EB CA to Belen With Project	42,933,775	160.24	4,792.41	1,240.36	96.66	93.76	4.44	453,244	12.30	37.86	457,857
Net Change 1% to 10% RD	-	10.71	359.09	89.26	5.72	5.55	0.38	13,862	1.05	3.22	14,254
EB 0% RD East of Belen - Phoenix	4,168,535	15.90	471.00	122.34	9.68	9.39	0.43	46,915	1.19	3.68	47,363
WB 0% RD Total Distance - Phoenix	5,785,147	22.07	653.67	169.78	13.43	13.03	0.60	65,110	1.66	5.10	65,731
Total 0% RD	-	37.97	1,124.67	292.12	23.11	22.42	1.03	112,025	2.85	8.78	113,094
Total Tons/Yr	-	48.68	1,483.76	381.38	28.84	27.97	1.41	125,887	3.90	12.00	127,348
Metric Tons/Year:								114,202	4	11	115,529

2033 Emissions

		VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO _x	CO ₂	N ₂ O	CH ₄	CO ₂ e
Annual	Gallons/Yr	Tons/Year									
1% RD EB CA to Belen No Project	42,658,430	146.92	4,490.90	1,249.98	87.89	85.26	4.41	477,127	12.23	37.62	481,711
10% RD EB CA to Belen With Project	47,555,329	160.59	4,951.84	1,373.88	95.29	92.43	4.92	502,033	13.63	41.94	507,143
Net Change 1% to 10% RD	-	13.67	460.94	123.89	7.40	7.18	0.51	24,906	1.40	4.32	25,432
EB 0% RD East of Belen - Phoenix	5,476,466	18.90	577.24	160.72	11.32	10.98	0.57	61,635	1.57	4.83	62,224
WB 0% RD Total Distance - Phoenix	7,600,310	26.23	801.10	223.05	15.71	15.24	0.79	85,538	2.18	6.70	86,355
Total 0% RD	-	45.13	1,378.34	383.78	27.03	26.21	1.35	147,174	3.75	11.53	148,579
Total Tons/Yr	-	58.81	1,839.27	507.67	34.43	33.39	1.86	172,080	5.15	15.85	174,011
Metric Tons/Year:								156,108	5	14	157,860

2048 Emissions

		VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO _x	CO ₂	N ₂ O	CH ₄	CO ₂ e
Annual	Gallons/Yr	Tons/Year									
1% RD EB CA to Belen No Project	55,515,941	162.79	5,250.01	1,626.74	94.42	91.58	5.75	620,936	15.91	48.96	626,901
10% RD EB CA to Belen With Project	61,159,043	175.84	5,720.61	1,766.89	101.16	98.13	6.33	645,645	17.53	53.93	652,216
Net Change 1% to 10% RD	-	13.05	470.59	140.15	6.74	6.54	0.58	24,709	1.62	4.98	25,315
EB 0% RD East of Belen - Phoenix	6,358,007	18.68	601.99	186.59	10.85	10.52	0.66	71,557	1.82	5.61	72,240
WB 0% RD Total Distance - Phoenix	8,823,724	25.93	835.45	258.96	15.05	14.60	0.91	99,307	2.53	7.78	100,256
Total 0% RD	-	44.61	1,437.44	445.55	25.90	25.12	1.57	170,864	4.35	13.39	172,496
Total Tons/Yr	-	48.68	1,483.76	381.38	28.84	27.97	1.41	195,573	5.97	18.36	197,811
Metric Tons/Year:								177,421	5	17	179,451

No BIG RD Reductions

	Pct RD	VOC	NO _x	CO	PM10	PM2.5	SO2	CO2
EB to Belen 2028-2048	1.0%	0.22%	0.12%	0.16%	0.30%	0.30%	0.00%	0.62%
WB/East of Belen 2028-2048	0.0%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

RD Reductions

	Year	Pct RD	VOC	NO _x	CO	PM10	PM2.5	SO2	CO2
	2028	10%	2.16%	1.21%	1.56%	3.04%	3.04%	0.00%	6.20%
	2033	10%	2.16%	1.21%	1.56%	3.04%	3.04%	0.00%	6.20%
	2048	10%	2.16%	1.21%	1.56%	3.04%	3.04%	0.00%	6.20%

*RD for EB trains fueled in CA only

	Percent Reduction from EPA Cert Diesel (%)					
	HC	NO _x	CO	PM	SO2	CO2
B5 - Hybrid	0.0%	0.0%	0.0%	0.0%	0%	3.1%
R20 - Hybrid	4.3%	2.4%	3.1%	6.1%	0%	12.4%
R30 - Hybrid	6.5%	3.6%	4.7%	9.1%	0%	18.6%
R100 - Hybrid	21.6%	12.1%	15.6%	30.4%	0%	62.0%

Composite Rates

2028										
Line Haul	Locomotive	g/gal								
Tier	Fleet Mix (%)	VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO _x	CO ₂	N ₂ O	CH ₄
Uncontrolled	0	0	0	0	0	0	0	0	0	0
Tier 0	0	0	0	0	0	0	0	0	0	0
Tier 0+	0	0	0	0	0	0	0	0	0	0
Tier 1	0	0	0	0	0	0	0	0	0	0
Tier 1+	0.237248479	1.506930216	33.0629481	6.31650351	0.986953673	0.957345063	0.022274785	2422.306972	0.061684605	0.18979878
Tier 2	0	0	0	0	0	0	0	0	0	0
Tier 2+	0.371782873	1.058581836	38.2787646	9.898347216	0.618646701	0.6000873	0.03490595	3795.903135	0.096663547	0.2974263
Tier 3	0.280299485	0.798100088	28.859635	7.462693496	0.466418343	0.452425793	0.026316758	2861.857745	0.072877866	0.22423959
Tier 4	0.110669162	0.09695681	2.30191858	2.946455779	0.034528779	0.033492915	0.010390506	1129.932148	0.028773982	0.08853533
Composite Rate:		3.460568951	102.503266	26.624	2.106547496	2.043351072	0.093888	10210	0.26	0.8

Truck Miles Traveled Reduction

Model Domain	2028 (MT/year)	C 2033 (MT/year)	CO2e 2048 (MT/year)	CO2e
SCAQMD Only	-68,478	-79,082	-78,963	
CA Only	-87,303	-100,953	-100,400	
Outside CA	-238,361	-275,808	-272,015	
Total: CA and Outside CA	-325,664	-376,761	-372,415	

EB CA to Belen

	Total EB Train Trips:	EB GT/train	Days/Yr	Miles	GTM/Year	GTM/gallon	Gallons/year
2028 No Project	29.20	5,903.26	365	562	35,355,391,289	900	39,283,768
2028 With Project	31.25	5,903.26	365	562	37,844,663,161	900	42,049,626
2033 No Project	31.70	5,903.26	365	562	38,392,586,962	900	42,658,430
2033 With Project	34.42	5,903.26	365	562	41,684,696,007	900	46,316,329
2048 No Project	41.26	5,903.26	365	562	49,964,347,146	900	55,515,941
2048 With Project	44.39	5,903.26	365	562	53,748,541,600	900	59,720,602

Source: Ensaf data: K:\ORA_AQN\195165003 - BNSF Barstow\3 AQGHG\3-2 Models\002 Locomotive\from ENSAFE\2025.07.16

Phoenix

	EB (gal/yr)	WB (gal/yr)	Total (gal/yr)
2028 No Project	-	-	-
2028 With Project	451,669	432,481	884,150
2033 No Project	-	-	-
2033 With Project	632,945	606,055	1,239,000
2048 No Project	-	-	-
2048 With Project	734,829	703,612	1,438,441

Notes:

CA fuel is currently a mix of 1% renewable diesel (RD)
Project would increase RD mix to 10%
Going eastbound from CA, Belen, NM is the next fueling location
Trains traveling EB currently have 1% RD to Belen, but would have 10% RD to Belen With Project
Trains traveling east of Belen would have 0% RD in both the No Project and With Project conditions
All WB trains are assumed to have 0% RD because they are fueled outside of CA
Phoenix trains do not go to Belen and are fueled in CA

Composite Rates2033										
Line Haul	Locomotive	g/gal								
Tier	Fleet Mix (%)	VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO _x	CO ₂	N ₂ O	CH ₄
Uncontrolled	0	0	0	0	0	0	0	0	0	0
Tier 0	0	0	0	0	0	0	0	0	0	0
Tier 0+	0	0	0	0	0	0	0	0	0	0
Tier 1	0	0	0	0	0	0	0	0	0	0
Tier 1+	0.174816915	1.110383898	24.3624852	4.654325537	0.727238365	0.705421214	0.01641321	1784.880699	0.045452398	0.13985353
Tier 2	0	0	0	0	0	0	0	0	0	0
Tier 2+	0.375383888	1.06883505	38.6495252	9.994220647	0.62463879	0.605899627	0.035244043	3832.669502	0.097599811	0.30030711
Tier 3	0.283014411	0.805830327	29.1391637	7.534975667	0.470935979	0.4568079	0.026571657	2889.577132	0.073583747	0.22641153
Tier 4	0.166784786	0.146119484	3.46912355	4.440478148	0.052036853	0.050475748	0.01565909	1702.872667	0.043364044	0.13342783
Composite Rate:		3.13116876	95.6202977	26.624	1.874849988	1.818604489	0.093888	10210	0.26	0.8

Composite Rates2048										
Line Haul	Locomotive	g/gal								
Tier	Fleet Mix (%)	VOC	NO _x	CO	PM ₁₀	PM _{2.5}	SO _x	CO ₂	N ₂ O	CH ₄
Uncontrolled	0	0	0	0	0	0	0	0	0	0
Tier 0	0	0	0	0	0	0	0	0	0	0
Tier 0+	0	0	0	0	0	0	0	0	0	0
Tier 1	0	0	0	0	0	0	0	0	0	0
Tier 1+	0.086665071	0.550470182	12.0776442	2.30737084	0.360526694	0.349710893	0.00813681	884.8503711	0.022532918	0.06933206
Tier 2	0	0	0	0	0	0	0	0	0	0
Tier 2+	0.380416567	1.083164656	39.1676897	10.12821068	0.633013167	0.614022772	0.035716551	3884.053148	0.098908307	0.30433325
Tier 3	0.286808714	0.816633894	29.5298252	7.635995212	0.477249701	0.46293221	0.026927897	2928.316974	0.074570266	0.22944697
Tier 4	0.246109648	0.215615678	5.11908068	6.55242327	0.07678621	0.074482624	0.023106743	2512.779507	0.063988508	0.19688772
Composite Rate:		2.665884411	85.8942399	26.624	1.547575772	1.501148499	0.093888	10210	0.26	0.8

Emission Rates											
Line Haul		g/bhp-hr							g/gal		
Tier	Engine Year	HC ⁽¹⁾	VOC ⁽²⁾	NO _x ⁽¹⁾	CO ⁽¹⁾	PM ₁₀ ⁽¹⁾	PM _{2.5} ⁽³⁾	SO _x ⁽⁴⁾	CO ₂ ⁽⁴⁾	N ₂ O ⁽⁵⁾	CH ₄ ⁽⁵⁾
Uncontrolled	Pre 1973	0.48	0.51	13.00	1.28	0.32	0.31	0.093888	10,210	0.26	0.8
Tier 0	1973-2001	0.48	0.51	8.60	1.28	0.32	0.31	0.093888	10,210	0.26	0.8
Tier 0+	1973-2001	0.30	0.32	7.20	1.28	0.20	0.19	0.093888	10,210	0.26	0.8
Tier 1	2002-2004	0.47	0.49	6.70	1.28	0.32	0.31	0.093888	10,210	0.26	0.8
Tier 1+	2002-2004	0.29	0.31	6.70	1.28	0.20	0.19	0.093888	10,210	0.26	0.8
Tier 2	2005-2011	0.26	0.27	4.95	1.28	0.18	0.17	0.093888	10,210	0.26	0.8
Tier 2+	2005-2011	0.13	0.14	4.95	1.28	0.08	0.08	0.093888	10,210	0.26	0.8
Tier 3	2011-2014	0.13	0.14	4.95	1.28	0.08	0.08	0.093888	10,210	0.26	0.8
Tier 4	2015	0.04	0.04	1.00	1.28	0.015	0.015	0.093888	10,210	0.26	0.8

- 1 Emission Factors for Locomotives (EPA-420-F-09-025), April 2009, Table 1.
- 2 VOC value calculated as 105.3% of HC value per EPA Conversion Factors for Hydrocarbon Emission Components, 2005.
- 3 PM2.5 emissions are estimated as 0.97 times the PM10 (U.S. EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009. <https://nepis.epa.gov/Exe/ZyPDF.cgi/P100500B.PDF?Dockkey=P100500B.PDF>
- 4 Emission Factors for Locomotives (EPA-420-F-09-025), April 2009, page 5.
- 5 GHG emission factors obtained from The Climate Registry. 2021 Emission Factors, Tables 2.1 and 2.7.
- * Fleet Mix from CARB Fleet Average Emissions Agreement in the South Coast Air Basin (1998 MOU).

SO2 Emission Rate											
SO2 (g/gal) = (fuel density) x (conversion factor) x (64g SO2/32g S) x (S content of fuel)											
Density of Diesel Fuel											
Sulfur Conversion in Fuel											
Conversion Factor											
Sulfur Content of Fuel											
SO2 (g/gal):		0.093888									

- 1 pound = 453.59 grams
- 1 ton = 907184.7 grams
- 1 ton = 0.9071847 metric tons
- 1 mile = 1609.344 meters
- Fuel Consumption = 20.8 bhp-hr/ga (Large Line-Haul and Passenger) (Source: Emission Factors for Locomotives (EPA-420-F-09-025), Table 3)

Mobile Source Emissions Summary - Truck Miles Traveled Reduction (Regional plus National)

¹ Data provided by Kimley-Horn and Associates, Inc. 2025

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2028 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TW	-3.22	-327.54	-80.88	-3.15	-33.85	-14.84	-14.40	-9.81	-49.37	-310,706.90	-325,665.38
		Dust					-166.68	-40.91					
		Annual Total	-3.22	-327.54	-80.88	-3.15	-200.53	-55.75	-14.40	-9.81	-49.37	-310,706.90	-325,665.38

2028 Summer (Pounds/Day)	Trucks	Exhaust & BW/TW	-17.73	-1,794.76	-443.06	-17.24	-185.50	-81.32	-78.98
		Dust					-913.31	-224.18	
		Summer Total	-17.73	-1,794.76	-443.06	-17.24	-1,098.82	-305.50	-78.98

2028 Winter (Pounds/Day)	Trucks	Exhaust & BW/TW	-17.54	-1,878.00	-443.47	-17.24	-185.51	-81.33	-78.76
		Dust					-913.31	-224.18	
		Winter Total	-17.54	-1,878.00	-443.47	-17.24	-1,098.82	-305.50	-78.76

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2033 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TW	-3.67	-365.78	-82.90	-3.64	-43.99	-19.02	-14.19	-9.19	-57.12	-359,509.53	-376,761.79
		Dust					-219.09	-53.78					
		Annual Total	-3.67	-365.78	-82.90	-3.64	-263.08	-72.79	-14.19	-9.19	-57.12	-359,509.53	-376,761.79

2033 Summer (Pounds/Day)	Trucks	Exhaust & BW/TW	-20.23	-2,004.28	-454.05	-19.96	-241.05	-104.20	-77.89	
		Dust						-1200.47	-294.66	
		Summer Total	-20.23	-2,004.28	-454.05	-19.96	-1,441.52	-398.86	-77.89	

2033 Winter (Pounds/Day)	Trucks	Exhaust & BW/TW	-19.99	-2,098.28	-454.66	-19.96	-241.05	-104.20	-77.61
		Dust						-1200.47	-294.66
		Winter Total	-19.99	-2,098.28	-454.66	-19.96	-1,441.52	-398.86	-77.61

			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2048 Annual (Tons/Year) (MT/yr for GHG)	Trucks	Exhaust & BW/TW	-3.62	-348.10	-51.23	-3.64	-49.69	-21.04	-9.39	-4.91	-56.33	-355,507.62	-372,415.56
		Dust					-254.91	-62.57					
		Annual Total	-3.62	-348.10	-51.23	-3.64	-304.60	-83.60	-9.39	-4.91	-56.33	-355,507.62	-372,415.56

2048 Summer (Pounds/Day)	Trucks	Exhaust & BW/TW	-19.95	-1,907.41	-280.41	-19.94	-272.29	-115.27	-51.57	
		Dust						-1396.75	-342.84	
		Summer Total	-19.95	-1,907.41	-280.41	-19.94	-1669.03	-458.11	-51.57	

2048 Winter (Pounds/Day)	Trucks	Exhaust & BW/TW	-19.67	-2,000.35	-281.20	-19.94	-272.29	-115.27	-51.26
		Dust					-1396.75	-342.84	
		Winter Total	-19.67	-2,000.35	-281.20	-19.94	-1669.04	-458.11	-51.26

							MT/Year
Tons/Year	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	CO ₂ e
2028 Trucks	-3.22	-327.54	-80.88	-3.15	-200.53	-55.75	-325,665.38
2033 Trucks	-3.67	-365.78	-82.90	-3.64	-263.08	-72.79	-376,761.79
2048 Trucks	-3.62	-348.10	-51.23	-3.64	-304.60	-83.60	-372,415.56
Pounds/Day	ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	
2028 Trucks	-17.54	-1,794.76	-443.06	-17.24	-1,098.82	-305.50	
2033 Trucks	-19.99	-2,004.28	-454.05	-19.96	-1,441.52	-398.86	
2048 Trucks	-19.67	-1,907.41	-280.41	-19.94	-1,669.03	-458.11	

Overall Total													
			Tons/Year						MT/Year				
			ROG	NO _x	CO	SO _x	PM ₁₀	PM _{2.5}	TOG	CH ₄	N ₂ O	CO ₂	CO ₂ e
2028 Annual			-3.22	-327.54	-80.88	-3.15	-200.53	-55.75	-14.40	-9.81	-49.37	-310,706.90	-325,665.38
2033 Annual			-3.67	-365.78	-82.90	-3.64	-263.08	-72.79	-14.19	-9.19	-57.12	-359,509.53	-376,761.79
2048 Annual			-3.62	-348.10	-51.23	-3.64	-304.60	-83.60	-9.39	-4.91	-56.33	-355,507.62	-372,415.56
			Pounds/Day										
2028 Summer			-17.73	-1,794.76	-443.06	-17.24	-1,098.82	-305.50	-78.98				
2028 Winter			-17.54	-1,878.00	-443.47	-17.24	-1,098.82	-305.50	-78.76				
2028 Daily Max			-17.54	-1,794.76	-443.06	-17.24	-1,098.82	-305.50	-78.76				
2033 Summer			-20.23	-2,004.28	-454.05	-19.96	-1,441.52	-398.86	-77.89				
2033 Winter			-19.99	-2,098.28	-454.66	-19.96	-1,441.52	-398.86	-77.61				
2033 Daily Max			-19.99	-2,004.28	-454.05	-19.96	-1,441.52	-398.86	-77.61				
2048 Summer			-19.95	-1,907.41	-280.41	-19.94	-1,669.03	-458.11	-51.57				
2048 Winter			-19.67	-2,000.35	-281.20	-19.94	-1,669.04	-458.11	-51.26				
2048 Daily Max			-19.67	-1,907.41	-280.41	-19.94	-1,669.03	-458.11	-51.26				

17. Mass Emissions and Health Effects

This page intentionally left blank.

S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,

Plaintiffs and Appellants,

v.

COUNTY OF FRESNO,

Defendant and Respondent,

and,

FRIANT RANCH, L.P.,

Real Party in Interest and Respondent.

SUPREME COURT
FILED

APR 13 2015

Frank A. McGuire Clerk
Deputy

After a Published Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726
Honorable Rosendo A. Pena, Jr.

**APPLICATION OF THE SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT FOR LEAVE TO FILE
BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY
AND [PROPOSED] BRIEF OF *AMICUS CURIAE***

Kurt R. Wiese, General Counsel (SBN 127251)
*Barbara Baird, Chief Deputy Counsel (SBN 81507)
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
21865 Copley Drive, Diamond Bar, CA 91765
Telephone: 909-396-2302; Facsimile: 909-396-2961
Email: bbaird@aqmd.gov
Counsel for [Proposed] Amicus Curiae,
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

RECEIVED

APR - 8 2015

CLERK SUPREME COURT

TABLE OF CONTENTS

APPLICATION FOR LEAVE TO FILE <i>amicus curiae</i> brief.....	App-1
HOW THIS BRIEF WILL ASSIST THE COURT	App-1
STATEMENT OF INTEREST OF <i>AMICUS CURIAE</i>	App-3
CERTIFICATION REGARDING AUTHORSHIP & FUNDING	App-4
BRIEF OF AMICUS CURIAE.....	1
SUMMARY OF ARGUMENT	1
ARGUMENT	2
I. RELEVANT FACTUAL AND LEGAL FRAMEWORK.	2
A. Air Quality Regulatory Background	2
B. The SCAQMD's Role Under CEQA.....	6
II. THIS COURT SHOULD NOT SET A HARD-AND-FAST RULE CONCERNING THE EXTENT TO WHICH AN EIR MUST CORRELATE A PROJECT'S EMISSION OF POLLUTANTS WITH RESULTING HEALTH IMPACTS.....	8
III. THE QUESTION OF WHETHER AN EIR CONTAINS SUFFICIENT ANALYSIS TO MEET CEQA'S REQUIREMENTS IS A MIXED QUESTION OF FACT AND LAW GOVERNED BY TWO DIFFERENT STANDARDS OF REVIEW.....	16
A. Standard of Review for Feasibility Determination and Sufficiency as an Informative Document.....	16
B. Friant Ranch's Rationale for Rejecting the Independent Judgment Standard of Review is Unsupported by Case Law.....	23
IV. COURTS MUST SCRUPULOUSLY ENFORCE THE REQUIREMENTS THAT LEAD AGENCIES CONSULT WITH AND OBTAIN COMMENTS FROM AIR DISTRICTS.....	26
CONCLUSION	29

TABLE OF AUTHORITIES

State Cases

<i>Association of Irrigated Residents v. County of Madera</i> (2003) 107 Cal App.4th 1383	1, 9
<i>Bakersfield Citizens for Local Control v. City of Bakersfield</i> (2004) 124 Cal.App.4th 1184	9, 22
<i>Berkeley Keep Jets Over the Bay v. Board of Port Commissioners</i> (2007) 91 Cal.App.4th 1344.....	21, 28
<i>Center for Biological Diversity v. County of San Bernardino</i> (2010) 185 Cal.App.4th 866.	20
<i>Citizens of Goleta Valley v. Bd. of Supervisors</i> (1990) 52 Cal.3d 553	8-9
<i>County of Amador v. El Dorado County Water Agency</i> (1999) 76 Cal.App.4th 931	23
<i>Crocker National Bank v. City and County of San Francisco</i> (1989) 49 Cal.3d 881	18
<i>Ebbetts Pass Forest Watch v. California Dept. of Forestry & Fire Protection</i> (2008) 43 Cal.4th 936.....	21
<i>Fall River Wild Trout Foundation v. County of Shasta</i> , (1999) 70 Cal.App.4th 482	27, 28
<i>Gray v. County of Madera</i> (2008) 167 Cal.App.4th 1099	25
<i>Laurel Heights Improvement Assn. v. Regents of the Univ of Cal. ("Laurel Heights I")</i> (1988) 47 Cal.3d 376.....	1, 8, 19, 20, 21, 22
<i>Natural Res. Def. Council v SCAQMD</i> , Los Angeles Superior Court No. BS110792.....	12
<i>Neighbors for Smart Rail v. Exposition Metro Line</i> (2013) 57 Cal.4th 439	15, 20

State Cases (cont'd)

<i>Orange County Air Pollution Control District v. Public Util. Com.</i> (1971) 4 Cal.3d 945.....	27
<i>Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors</i> (2001) 87 Cal.App.4th 99.....	19
<i>Schenck v. County of Sonoma</i> (2011) 198 Cal.App.4th 949	26, 27
<i>Sierra Club v. County of Fresno</i> (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271	9, 23
<i>Sierra Club v. State Bd. Of Forestry</i> (1994) 7 Cal.4th 1215	28
<i>Uphold Our Heritage v. Town of Woodside</i> (2007) 147 Cal.App.4th 587	20
<i>Vineyard Area Citizens for Responsible Growth, Inc.</i> <i>v. City of Rancho Cordova</i> (2007) 40 Cal.4th 412	1, 17, 19, 24, 25, 26
<i>Western Oil & Gas Assn. v. Monterey Bay Unified APCD</i> (1989) 49 Cal.3d 408	5

California Statutes

Health & Saf. Code § 39666	5
Health & Saf. Code § 40000	3
Health & Saf. Code § 40001	3
Health & Saf. Code § 40410	3
Health & Saf. Code §§ 40460, et seq.....	4
Health & Saf. Code § 41508	5
Health & Saf. Code §§ 42300, et seq.....	5
Health & Saf. Code § 44320	5
Health & Saf. Code § 44322	5
Health & Saf. Code § 44360	5
Pub. Resources Code § 20180.3.....	27
Pub. Resources Code § 21061.....	19
Pub. Resources Code § 21061.1.....	16

California Statutes (cont'd)

Pub. Resources Code § 21080.....	6
Pub. Resources Code § 21080.5.....	6
Pub. Resources Code § 21083.1.....	26
Pub. Resources Code § 21100.....	27
Pub. Resources Code § 21104.....	6, 7 26
Pub. Resources Code §§ 21150-21154	7
Pub. Resources Code § 21151.8.....	25
Pub. Resources Code § 21153	6, 7, 26

California Regulations

Cal. Code Regs., tit. 14, §§ 15000, et seq. ("CEQA Guidelines")

CEQA Guidelines § 15050.....	6
CEQA Guidelines § 15051.....	1, 6
CEQA Guidelines § 15073.....	6
CEQA Guidelines § 15086.....	6
CEQA Guidelines § 15088.5.....	28
CEQA Guidelines § 15096.....	6
CEQA Guidelines § 15126.2.....	25
CEQA Guidelines § 15131.....	26
CEQA Guidelines § 15144.....	19, 24
CEQA Guidelines § 15151.....	9, 18, 19
CEQA Guidelines § 15204.....	1, 9, 21
CEQA Guidelines § 15251.....	6
CEQA Guidelines § 15366.....	7
CEQA Guidelines § 15381.....	6

Cal. Code Regs., tit. 17, § 60104	3
---	---

Federal Statutes

42 U.S.C. § 7401; CAA § 101	4
42 U.S.C. § 7408; CAA § 108	3
42 U.S.C. § 7409; CAA § 109	4
42 U.S.C. § 7410; CAA § 110	4, 5
42 U.S.C. § 7412; CAA § 112	5
42 U.S.C. § 7502; CAA § 172	5, 13
42 U.S.C. § 7503; CAA § 173	5, 13
42 U.S.C. § 7511a; CAA § 182.....	13
42 U.S.C. § 7521; CAA § 202	4
42 U.S.C. § 7543; CAA § 209	4
42 U.S.C. § 7547; CAA § 213	4

Rules

SCAQMD Rule 1303	7
SCAQMD Rule 1401	5, 8, 9

Other

Association of Environmental Professionals, 2015 CEQA Statute and Guidelines (2015) (Appendix G, “Environmental Checklist Form.”)	24
CARB, <i>Health Impacts Analysis: PM Premature Death Relationship</i>	14
CARB, <i>Health Impacts Analysis: PM Mortality Relationship</i>	16
CARB, Resolution 98-35, Aug. 27, 1998	8
SCAQMD, <i>Air Quality Analysis Handbook</i>	13
SCAQMD, <i>Final 2012 AQMP (Feb. 2013)</i>	3, 11
SCAQMD, <i>Final Subsequent Mitigated Negative Declaration for: Warren E&P, Inc. WTU Central Facility, New Equipment Project (certified July 19, 2011)</i>	14-15
SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, <i>Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System</i> , ...	12
SCAQMD Governing Board Agenda, April 3, 2015, Agenda Item 16, Attachment A	7
SCAQMD, Health Risk Assessment Summary form	10
SCAQMD, <i>Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics “Hot Spots” Information and Assessment Act (AB2588)</i>	10
U.S. EPA, Ground Level Ozone	11
U.S. EPA, <i>Guideline on Ozone Monitoring Site Selection</i> (Aug. 1998) EPA-454/R-98-002 § 5.1.2	11
U.S. EPA, <i>Health Effects of Ozone in the General Population</i> , Figure 9, ...	11
U.S. EPA, National Ambient Air Quality Standards (NAAQS)	4
U.S. EPA, Particulate Matter (PM)	4

**TO THE HONORABLE CHIEF JUSTICE AND JUSTICES OF THE
SUPREME COURT:**

APPLICATION FOR LEAVE TO FILE *AMICUS CURIAE* BRIEF

Pursuant to Rule 8.520(f) of the California Rules of Court, the South Coast Air Quality Management District (SCAQMD) respectfully requests leave to file the attached *amicus curiae* brief. Because SCAQMD's position differs from that of either party, we request leave to submit this amicus brief in support of neither party.

HOW THIS BRIEF WILL ASSIST THE COURT

SCAQMD's proposed amicus brief takes a position on two of the issues in this case. In both instances, its position differs from that of either party. The issues are:

- 1) Does the California Environmental Quality Act (CEQA) require an environmental impact report (EIR) to correlate a project's air pollution emissions with specific levels of health impacts?
- 2) What is the proper standard of review for determining whether an EIR provides sufficient information on the health impacts caused by a project's emission of air pollutants?

This brief will assist the Court by discussing the practical realities of correlating identified air quality impacts with specific health outcomes. In short, CEQA requires agencies to provide detailed information about a project's air quality impacts that is sufficient for the public and decisionmakers to adequately evaluate the project and meaningfully understand its impacts. However, the level of analysis is governed by a rule of reason; CEQA only requires agencies to conduct analysis if it is reasonably feasible to do so.

With regard to health-related air quality impacts, an analysis that correlates a project's air pollution emissions with specific levels of health impacts will be feasible in some cases but not others. Whether it is feasible depends on a variety of factors, including the nature of the project and the nature of the analysis under consideration. The feasibility of analysis may also change over time as air districts and others develop new tools for measuring projects' air quality related health impacts. Because SCAQMD has among the most sophisticated air quality modeling and health impact evaluation capability of any of the air districts in the State, it is uniquely situated to express an opinion on the extent to which the Court should hold that CEQA requires lead agencies to correlate air quality impacts with specific health outcomes.

SCAQMD can also offer a unique perspective on the question of the appropriate standard of review. SCAQMD submits that the proper standard of review for determining whether an EIR is sufficient as an informational document is more nuanced than argued by either party. In our view, this is a mixed question of fact and law. It includes determining whether additional analysis is feasible, which is primarily a factual question that should be reviewed under the substantial evidence standard. However, it also involves determining whether the omission of a particular analysis renders an EIR insufficient to serve CEQA's purpose as a meaningful, informational document. If a lead agency has not determined that a requested analysis is infeasible, it is the court's role to determine whether the EIR nevertheless meets CEQA's purposes, and courts should not defer to the lead agency's conclusions regarding the legal sufficiency of an EIR's analysis. The ultimate question of whether an EIR's analysis is "sufficient" to serve CEQA's informational purposes is predominately a question of law that courts should review de novo.

This brief will explain the rationale for these arguments and may assist the Court in reaching a conclusion that accords proper respect to a lead agency's factual conclusions while maintaining judicial authority over the ultimate question of what level of analysis CEQA requires.

STATEMENT OF INTEREST OF *AMICUS CURIAE*

The SCAQMD is the regional agency primarily responsible for air pollution control in the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of the Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410; Cal. Code Regs., tit. 17, § 60104.) The SCAQMD participates in the CEQA process in several ways. Sometimes it acts as a lead agency that prepares CEQA documents for projects. Other times it acts as a responsible agency when it has permit authority over some part of a project that is undergoing CEQA review by a different lead agency. Finally, SCAQMD also acts as a commenting agency for CEQA documents that it receives because it is a public agency with jurisdiction by law over natural resources affected by the project.

In all of these capacities, SCAQMD will be affected by the decision in this case. SCAQMD sometimes submits comments requesting that a lead agency perform an additional type of air quality or health impacts analysis. On the other hand, SCAQMD sometimes determines that a particular type of health impact analysis is not feasible or would not produce reliable and informative results. Thus, SCAQMD will be affected by the Court's resolution of the extent to which CEQA requires EIRs to correlate emissions and health impacts, and its resolution of the proper standard of review.

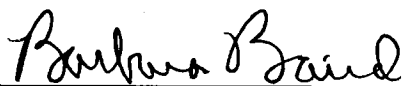
CERTIFICATION REGARDING AUTHORSHIP AND FUNDING

No party or counsel in the pending case authored the proposed amicus curiae brief in whole or in part, or made any monetary contribution intended to fund the preparation or submission of the brief. No person or entity other than the proposed *Amicus Curiae* made any monetary contribution intended to fund the preparation or submission of the brief.

Respectfully submitted,

DATED: April 3, 2015

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
KURT R. WIESE, GENERAL COUNSEL
BARBARA BAIRD, CHIEF DEPUTY COUNSEL

By: 
Barbara Baird

Attorneys for [proposed] Amicus Curiae
SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT

BRIEF OF AMICUS CURIAE

SUMMARY OF ARGUMENT

The South Coast Air Quality Management District (SCAQMD) submits that this Court should not try to establish a hard-and-fast rule concerning whether lead agencies are required to correlate emissions of air pollutants with specific health consequences in their environmental impact reports (EIR). The level of detail required in EIRs is governed by a few, core CEQA (California Environmental Quality Act) principles. As this Court has stated, “[a]n EIR must include detail sufficient to enable those who did not participate in its preparation to understand and to consider meaningfully the issues raised by the proposed project.” (*Laurel Heights Improvement Assn. v. Regents of the Univ of Cal.* (1988) 47 Cal.3d 376, 405 [*“Laurel Heights I”*]) Accordingly, “an agency must use its best efforts to find out and disclose all that it reasonably can.” (*Vineyard Area Citizens for Responsible Growth, Inc. v. City of Rancho Cordova* (2007) 40 Cal.4th 412, 428 (quoting CEQA Guidelines § 15144)¹). However, “[a]nalysis of environmental effects need not be exhaustive, but will be judged in light of what is reasonably feasible.” (*Association of Irrigated Residents v. County of Madera* (2003) 107 Cal.App.4th 1383, 1390; CEQA Guidelines §§ 15151, 15204(a).)

With regard to analysis of air quality related health impacts, EIRs must generally quantify a project’s pollutant emissions, but in some cases it is not feasible to correlate these emissions to specific, quantifiable health impacts (e.g., premature mortality; hospital admissions). In such cases, a general description of the adverse health impacts resulting from the pollutants at issue may be sufficient. In other cases, due to the magnitude

¹ The CEQA Guidelines are found at Cal. Code Regs., tit. 14 §§ 15000, *et seq.*

or nature of the pollution emissions, as well as the specificity of the project involved, it may be feasible to quantify health impacts. Or there may be a less exacting, but still meaningful analysis of health impacts that can feasibly be performed. In these instances, agencies should disclose those impacts.

SCAQMD also submits that whether or not an EIR complies with CEQA's informational mandates by providing sufficient, feasible analysis is a mixed question of fact and law. Pertinent here, the question of whether an EIR's discussion of health impacts from air pollution is sufficient to allow the public to understand and consider meaningfully the issues involves two inquiries: (1) Is it feasible to provide the information or analysis that a commenter is requesting or a petitioner is arguing should be required?; and (2) Even if it is feasible, is the agency relying on other policy or legal considerations to justify not preparing the requested analysis? The first question of whether an analysis is feasible is primarily a question of fact that should be judged by the substantial evidence standard. The second inquiry involves evaluating CEQA's information disclosure purposes against the asserted reasons to not perform the requested analysis. For example, an agency might believe that its EIR meets CEQA's informational disclosure standards even without a particular analysis, and therefore choose not to conduct that analysis. SCAQMD submits that this is more of a legal question, which should be reviewed de novo as a question of law.

ARGUMENT

I. RELEVANT FACTUAL AND LEGAL FRAMEWORK.

A. Air Quality Regulatory Background

The South Coast Air Quality Management District (SCAQMD) is one of the local and regional air pollution control districts and air quality

management districts in California. The SCAQMD is the regional air pollution agency for the South Coast Air Basin, which consists of all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties. (Health & Saf. Code § 40410, 17 Cal. Code Reg. § 60104.) The SCAQMD also includes the Coachella Valley in Riverside County (Palm Springs area to the Salton Sea). (SCAQMD, *Final 2012 AQMP* (Feb. 2013), <http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan>; then follow “chapter 7” hyperlink; pp 7-1, 7-3 (last visited Apr. 1, 2015).) The SCAQMD's jurisdiction includes over 16 million residents and has the worst or nearly the worst air pollution levels in the country for ozone and fine particulate matter. (SCAQMD, *Final 2012 AQMP* (Feb. 2013), <http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan>; then follow “Executive Summary” hyperlink p. ES-1 (last visited Apr. 1, 2015).)

Under California law, the local and regional districts are primarily responsible for controlling air pollution from all sources except motor vehicles. (Health & Saf. Code § 40000.) The California Air Resources Board (CARB), part of the California Environmental Protection Agency, is primarily responsible for controlling pollution from motor vehicles. (*Id.*) The air districts must adopt rules to achieve and maintain the state and federal ambient air quality standards within their jurisdictions. (Health & Saf. Code § 40001.)

The federal Clean Air Act (CAA) requires the United States Environmental Protection Agency (EPA) to identify pollutants that are widely distributed and pose a threat to human health, developing a so-called “criteria” document. (42 U.S.C. § 7408; CAA § 108.) These pollutants are frequently called “criteria pollutants.” EPA must then establish “national ambient air quality standards” at levels “requisite to protect public health”,

allowing “an adequate margin of safety.” (42 U.S.C. § 7409; CAA § 109.) EPA has set standards for six identified pollutants: ozone, nitrogen dioxide, sulfur dioxide, carbon monoxide, particulate matter (PM), and lead. (U.S. EPA, National Ambient Air Quality Standards (NAAQS), <http://www.epa.gov/air/criteria.html> (last updated Oct. 21, 2014).)²

Under the Clean Air Act, EPA sets emission standards for motor vehicles and “nonroad engines” (mobile farm and construction equipment, marine vessels, locomotives, aircraft, etc.). (42 U.S.C. §§ 7521, 7547; CAA §§ 202, 213.) California is the only state allowed to establish emission standards for motor vehicles and most nonroad sources; however, it may only do so with EPA's approval. (42 U.S.C. §§ 7543(b), 7543(e); CAA §§ 209(b), 209(c).) Sources such as manufacturing facilities, power plants and refineries that are not mobile are often referred to as “stationary sources.” The Clean Air Act charges state and local agencies with the primary responsibility to attain the national ambient air quality standards. (42 U.S.C. § 7401(a)(3); CAA § 101(a)(3).) Each state must adopt and implement a plan including enforceable measures to achieve and maintain the national ambient air quality standards. (42 U.S.C. § 7410; CAA § 110.) The SCAQMD and CARB jointly prepare portion of the plan for the South Coast Air Basin and submit it for approval by EPA. (Health & Saf. Code §§ 40460, et seq.)

The Clean Air Act also requires state and local agencies to adopt a permit program requiring, among other things, that new or modified “major” stationary sources use technology to achieve the “lowest achievable emission rate,” and to control minor stationary sources as

² Particulate matter (PM) is further divided into two categories: fine particulate or PM_{2.5} (particles with a diameter of less than or equal to 2.5 microns) and coarse particulate (PM₁₀) (particles with a diameter of 10 microns or less). (U.S. EPA, Particulate Matter (PM), <http://www.epa.gov/airquality/particulatepollution/> (last visited Apr. 1, 2015).)

needed to help attain the standards. (42 U.S.C. §§ 7502(c)(5), 7503(a)(2), 7410(a)(2)(C); CAA §§ 172(c)(5), 173(a)(2), 110(a)(2)(C).) The air districts implement these permit programs in California. (Health & Saf. Code §§ 42300, et seq.)

The Clean Air Act also sets out a regulatory structure for over 100 so-called “hazardous air pollutants” calling for EPA to establish “maximum achievable control technology” (MACT) for sources of these pollutants. (42 U.S.C. § 7412(d)(2); CAA § 112(d)(2).) California refers to these pollutants as “toxic air contaminants” (TACs) which are subject to two state-required programs. The first program requires “air toxics control measures” for specific categories of sources. (Health & Saf. Code § 39666.) The other program requires larger stationary sources and sources identified by air districts to prepare “health risk assessments” for impacts of toxic air contaminants. (Health & Saf. Code §§ 44320(b), 44322, 44360.) If the health risk exceeds levels identified by the district as “significant,” the facility must implement a “risk reduction plan” to bring its risk levels below “significant” levels. Air districts may adopt additional more stringent requirements than those required by state law, including requirements for toxic air contaminants. (Health & Saf. Code § 41508; *Western Oil & Gas Assn. v. Monterey Bay Unified APCD* (1989) 49 Cal.3d 408, 414.) For example, SCAQMD has adopted a rule requiring new or modified sources to keep their risks below specified levels and use best available control technology (BACT) for toxics. (SCAQMD, *Rule 1401-New Source Review of Toxic Air Contaminants*, <http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiv>; then follow “Rule 1401” hyperlink (last visited Apr. 1, 2015).)

B. The SCAQMD's Role Under CEQA

The California Environmental Quality Act (CEQA) requires public agencies to perform an environmental review and appropriate analysis for projects that they implement or approve. (Pub. Resources Code § 21080(a).) The agency with primary approval authority for a particular project is generally the “lead agency” that prepares the appropriate CEQA document. (CEQA Guidelines §§ 15050, 15051.) Other agencies having a subsequent approval authority over all or part of a project are called “responsible” agencies that must determine whether the CEQA document is adequate for their use. (CEQA Guidelines §§ 15096(c), 15381.) Lead agencies must also consult with and circulate their environmental impact reports to “trustee agencies” and agencies “with jurisdiction by law” including “authority over resources which may be affected by the project.” (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines §§ 15086(a)(3), 15073(c).) The SCAQMD has a role in all these aspects of CEQA.

Fulfilling its responsibilities to implement its air quality plan and adopt rules to attain the national ambient air quality standards, SCAQMD adopts a dozen or more rules each year to require pollution reductions from a wide variety of sources. The SCAQMD staff evaluates each rule for any adverse environmental impact and prepares the appropriate CEQA document. Although most rules reduce air emissions, they may have secondary environmental impacts such as use of water or energy or disposal of waste—e.g., spent catalyst from control equipment.³

³ The SCAQMD's CEQA program for its rules is a “Certified Regulatory Program” under which it prepares a “functionally equivalent” document in lieu of a negative declaration or EIR. (Pub. Resources Code § 21080.5, CEQA Guidelines § 15251(l).)

The SCAQMD also approves a large number of permits every year to construct new, modified, or replacement facilities that emit regulated air pollutants. The majority of these air pollutant sources have already been included in an earlier CEQA evaluation for a larger project, are currently being evaluated by a local government as lead agency, or qualify for an exemption. However, the SCAQMD sometimes acts as lead agency for major projects where the local government does not have a discretionary approval. In such cases, SCAQMD prepares and certifies a negative declaration or environmental impact report (EIR) as appropriate.⁴ SCAQMD evaluates perhaps a dozen such permit projects under CEQA each year. SCAQMD is often also a “responsible agency” for many projects since it must issue a permit for part of the projects (e.g., a boiler used to provide heat in a commercial building). For permit projects evaluated by another lead agency under CEQA, SCAQMD has the right to determine that the CEQA document is inadequate for its purposes as a responsible agency, but it may not do so because its permit program already requires all permitted sources to use the best available air pollution control technology. (SCAQMD, *Rule 1303(a)(1) – Requirements*, <http://www.aqmd.gov/home/regulations/rules/scaqmd-rule-book/regulation-xiii>; then follow “Rule 1303” hyperlink (last visited Apr. 1, 2015).)

Finally, SCAQMD receives as many as 60 or more CEQA documents each month (around 500 per year) in its role as commenting agency or an agency with “jurisdiction by law” over air quality—a natural resource affected by the project. (Pub. Resources Code §§ 21104(a), 21153; CEQA Guidelines § 15366(a)(3).) The SCAQMD staff provides comments on as many as 25 or 30 such documents each month.

⁴ The SCAQMD's permit projects are not included in its Certified Regulatory Program, and are evaluated under the traditional local government CEQA analysis. (Pub. Resources Code §§ 21150-21154.)

(SCAQMD Governing Board Agenda, Apr. 3, 2015, Agenda Item 16, Attachment A, <http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-april-3-2015>; then follow “16. Lead Agency Projects and Environmental Documents Received by SCAQMD” hyperlink (last visited Apr. 1, 2015).) Of course, SCAQMD focuses its commenting efforts on the more significant projects.

Typically, SCAQMD comments on the adequacy of air quality analysis, appropriateness of assumptions and methodology, and completeness of the recommended air quality mitigation measures. Staff may comment on the need to prepare a health risk assessment detailing the projected cancer and noncancer risks from toxic air contaminants resulting from the project, particularly the impacts of diesel particulate matter, which CARB has identified as a toxic air contaminant based on its carcinogenic effects. (California Air Resources Board, Resolution 98-35, Aug. 27, 1998, <http://www.arb.ca.gov/regact/diesltac/diesltac.htm>; then follow Resolution 98-35 hyperlink (last visited Apr. 1, 2015).) Because SCAQMD already requires new or modified stationary sources of toxic air contaminants to use the best available control technology for toxics and to keep their risks below specified levels, (SCAQMD Rule 1401, *supra*, note 15), the greatest opportunity to further mitigate toxic impacts through the CEQA process is by reducing emissions—particularly diesel emissions—from vehicles.

II. THIS COURT SHOULD NOT SET A HARD-AND-FAST RULE CONCERNING THE EXTENT TO WHICH AN EIR MUST CORRELATE A PROJECT’S EMISSION OF POLLUTANTS WITH RESULTING HEALTH IMPACTS.

Numerous cases hold that courts do not review the correctness of an EIR’s conclusions but rather its sufficiency as an informative document. (*Laurel Heights 1*, *supra*, 47 Cal.3d at p. 392; *Citizens of Goleta Valley v.*

Bd. of Supervisors (1990) 52 Cal.3d 553, 569; *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1197.)

As stated by the Court of Appeal in this case, where an EIR has addressed a topic, but the petitioner claims that the information provided about that topic is insufficient, courts must “draw[] a line that divides *sufficient* discussions from those that are *insufficient*.” (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) The Court of Appeal readily admitted that “[t]he terms themselves – sufficient and insufficient – provide little, if any, guidance as to where the line should be drawn. They are simply labels applied once the court has completed its analysis.” (*Id.*)

The CEQA Guidelines, however, provide guidance regarding what constitutes a sufficient discussion of impacts. Section 15151 states that “the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible.” Case law reflects this: “Analysis of environmental effects need not be exhaustive, but will be judged in light of what was reasonably feasible.” (*Association of Irrigated Residents v. County of Madera, supra*, 107 Cal.App.4th at p. 1390; see also CEQA Guidelines § 15204(a).)

Applying this test, this Court cannot realistically establish a hard-and-fast rule that an analysis correlating air pollution impacts of a project to quantified resulting health impacts is always required, or indeed that it is never required. Simply put, in some cases such an analysis will be “feasible”; in some cases it will not.

For example, air pollution control districts often require a proposed new source of toxic air contaminants to prepare a “health risk assessment” before issuing a permit to construct. District rules often limit the allowable cancer risk the new source may cause to the “maximally exposed individual” (worker and residence exposures). (See, e.g., SCAQMD Rule 1401(c)(8); 1401(d)(1), *supra* note 15.) In order to perform this analysis, it

is necessary to have data regarding the sources and types of air toxic contaminants, location of emission points, velocity of emissions, the meteorology and topography of the area, and the location of receptors (worker and residence). (SCAQMD, *Supplemental Guidelines for Preparing Risk Assessments for the Air Toxics "Hot Spots" Information and Assessment Act (AB2588)*, pp. 11-16; (last visited Apr. 1, 2015) [http://www.aqmd.gov/home/library/documents-support-material](http://www.aqmd.gov/home/library/documents-support-material;); "Guidelines" hyperlink; AB2588; then follow AB2588 Risk Assessment Guidelines hyperlink.)

Thus, it is feasible to determine the health risk posed by a new gas station locating at an intersection in a mixed use area, where receptor locations are known. On the other hand, it may not be feasible to perform a health risk assessment for airborne toxics that will be emitted by a generic industrial building that was built on "speculation" (i.e., without knowing the future tenant(s)). Even where a health risk assessment can be prepared, however, the resulting maximum health risk value is only a calculation of risk—it does not necessarily mean anyone will contract cancer as a result of the project.

In order to find the "cancer burden" or expected additional cases of cancer resulting from the project, it is also necessary to know the numbers and location of individuals living within the "zone of impact" of the project: i.e., those living in areas where the projected cancer risk from the project exceeds one in a million. (SCAQMD, Health Risk Assessment Summary form, <http://www.aqmd.gov/home/forms>; filter by "AB2588" category; then "Health Risk Assessment" hyperlink (last visited Apr. 1, 2015).) The affected population is divided into bands of those exposed to at least 1 in a million risk, those exposed to at least 10 in a million risk, etc. up to those exposed at the highest levels. (*Id.*) This data allows agencies to calculate an approximate number of additional cancer cases expected from

the project. However, it is not possible to predict which particular individuals will be affected.

For the so-called criteria pollutants⁵, such as ozone, it may be more difficult to quantify health impacts. Ozone is formed in the atmosphere from the chemical reaction of the nitrogen oxides (NO_x) and volatile organic compounds (VOC) in the presence of sunlight. (U.S. EPA, Ground Level Ozone, <http://www.epa.gov/airquality/ozonepollution/> (last updated Mar. 25, 2015).) It takes time and the influence of meteorological conditions for these reactions to occur, so ozone may be formed at a distance downwind from the sources. (U.S. EPA, *Guideline on Ozone Monitoring Site Selection* (Aug. 1998) EPA-454/R-98-002 § 5.1.2, <http://www.epa.gov/ttnamti1/archive/cpreldoc.html> (last visited Apr. 1, 2015).) NO_x and VOC are known as “precursors” of ozone.

Scientifically, health effects from ozone are correlated with increases in the ambient level of ozone in the air a person breathes. (U.S. EPA, *Health Effects of Ozone in the General Population*, Figure 9, <http://www.epa.gov/apti/ozonehealth/population.html#levels> (last visited Apr. 1, 2015).) However, it takes a large amount of additional precursor emissions to cause a modeled increase in ambient ozone levels over an entire region. For example, the SCAQMD's 2012 AQMP showed that reducing NO_x by 432 tons per day (157,680 tons/year) and reducing VOC by 187 tons per day (68,255 tons/year) would reduce ozone levels at the SCAQMD's monitor site with the highest levels by only 9 parts per billion. (South Coast Air Quality Management District, *Final 2012 AQMP* (February 2013), <http://www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-2012-air-quality-management-plan>; then follow “Appendix V: Modeling & Attainment Demonstrations” hyperlink,

⁵ See discussion of types of pollutants, *supra*, Part I.A.

pp. v-4-2, v-7-4, v-7-24.) SCAQMD staff does not currently know of a way to accurately quantify ozone-related health impacts caused by NO_x or VOC emissions from relatively small projects.

On the other hand, this type of analysis may be feasible for projects on a regional scale with very high emissions of NO_x and VOCs, where impacts are regional. For example, in 2011 the SCAQMD performed a health impact analysis in its CEQA document for proposed Rule 1315, which authorized various newly-permitted sources to use offsets from the districts “internal bank” of emission reductions. This CEQA analysis accounted for essentially *all* the increases in emissions due to new or modified sources in the District between 2010 and 2030.⁶ The SCAQMD was able to correlate this very large emissions increase (e.g., 6,620 pounds per day NO_x (1,208 tons per year), 89,180 pounds per day VOC (16,275 tons per year)) to expected health outcomes from ozone and particulate matter (e.g., 20 premature deaths per year and 89,947 school absences in the year 2030 due to ozone).⁷ (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System* (see hyperlink in fn 6) at p. 4.1-35, Table 4.1-29.)

⁶ (SCAQMD Governing Board Agenda, February 4, 2011, Agenda Item 26, Attachment G, *Assessment for: Re-adoption of Proposed Rule 1315 – Federal New Source Review Tracking System, Vol. 1, p.4.0-6*, <http://www.aqmd.gov/home/library/meeting-agendas-minutes/agenda?title=governing-board-meeting-agenda-february-4-2011>; the follow “26. Adopt Proposed Rule 1315 – Federal New Source Review Tracking System” (last visited April 1, 2015).)

⁷ The SCAQMD was able to establish the location of future NO_x and VOC emissions by assuming that new projects would be built in the same locations and proportions as existing stationary sources. This CEQA document was upheld by the Los Angeles County Superior Court in *Natural Res. Def. Council v SCAQMD*, Los Angeles Superior Court No. BS110792).

However, a project emitting only 10 tons per year of NO_x or VOC is small enough that its regional impact on ambient ozone levels may not be detected in the regional air quality models that are currently used to determine ozone levels. Thus, in this case it would not be feasible to directly correlate project emissions of VOC or NO_x with specific health impacts from ozone. This is in part because ozone formation is not linearly related to emissions. Ozone impacts vary depending on the location of the emissions, the location of other precursor emissions, meteorology and seasonal impacts, and because ozone is formed some time later and downwind from the actual emission. (EPA Guideline on Ozone Monitoring Site Selection (Aug. 1998) EPA-454/R-98-002, § 5.1.2; <https://www.epa.gov/ttnamti1/archive/cpreldoc.html>; then search “Guideline on Ozone Monitoring Site Selection” click on pdf) (last viewed Apr. 1, 2015).)

SCAQMD has set its CEQA “significance” threshold for NO_x and VOC at 10 tons per year (expressed as 55 lb/day). (SCAQMD, *Air Quality Analysis Handbook*, <http://www.aqmd.gov/home/regulations/ceqa/air-quality-analysis-handbook>; then follow “SCAQMD Air Quality Significance Thresholds” hyperlink (last visited Apr. 1, 2015).) This is because the federal Clean Air Act defines a “major” stationary source for “extreme” ozone nonattainment areas such as SCAQMD as one emitting 10 tons/year. (42 U.S.C. §§ 7511a(e), 7511a(f); CAA §§ 182(e), 182(f).) Under the Clean Air Act, such sources are subject to enhanced control requirements (42 U.S.C. §§ 7502(c)(5), 7503; CAA §§ 172(c)(5), 173), so SCAQMD decided this was an appropriate threshold for making a CEQA “significance” finding and requiring feasible mitigation. Essentially, SCAQMD takes the position that a source that emits 10 tons/year of NO_x or VOC would contribute cumulatively to ozone formation. Therefore, lead agencies that use SCAQMD’s thresholds of significance may determine

that many projects have “significant” air quality impacts and must apply all feasible mitigation measures, yet will not be able to precisely correlate the project to quantifiable health impacts, unless the emissions are sufficiently high to use a regional modeling program.

In the case of particulate matter (PM_{2.5})⁸, another “criteria” pollutant, SCAQMD staff is aware of two possible methods of analysis. SCAQMD used regional modeling to predict expected health impacts from its proposed Rule 1315, as mentioned above. Also, the California Air Resources Board (CARB) has developed a methodology that can predict expected mortality (premature deaths) from large amounts of PM_{2.5}. (California Air Resources Board, *Health Impacts Analysis: PM Premature Death Relationship*, http://www.arb.ca.gov/research/health/pm-mort/pm-mort_arch.htm (last reviewed Jan. 19, 2012).) SCAQMD used the CARB methodology to predict impacts from three very large power plants (e.g., 731-1837 lbs/day). (Final Environmental Assessment for Rule 1315, *supra*, pp 4.0-12, 4.1-13, 4.1-37 (e.g., 125 premature deaths in the entire SCAQMD in 2030), 4.1-39 (0.05 to 1.77 annual premature deaths from power plants.) Again, this project involved large amounts of additional PM_{2.5} in the District, up to 2.82 tons/day (5,650 lbs/day of PM_{2.5}, or, or 1029 tons/year. (*Id.* at table 4.1-4, p. 4.1-10.)

However, the primary author of the CARB methodology has reported that this PM_{2.5} health impact methodology is not suited for small projects and may yield unreliable results due to various uncertainties.⁹ (SCAQMD, *Final Subsequent Mitigated Negative Declaration for: Warren*

⁸ SCAQMD has not attained the latest annual or 24-hour national ambient air quality standards for “PM_{2.5}” or particulate matter less than 2.5 microns in diameter.

⁹ Among these uncertainties are the representativeness of the population used in the methodology, and the specific source of PM and the corresponding health impacts. (*Id.* at p. 2-24.)

E&P, Inc. WTU Central Facility, New Equipment Project (certified July 19, 2011), <http://www.aqmd.gov/home/library/documents-support-material/lead-agency-permit-projects/permit-project-documents---year-2011>; then follow “Final Subsequent Mitigated Negative Declaration for Warren E&P Inc. WTU Central Facility, New Equipment Project” hyperlink, pp. 2-22, 2-23 (last visited Apr. 1, 2015).) Therefore, when SCAQMD prepared a CEQA document for the expansion of an existing oil production facility, with very small PM_{2.5} increases (3.8 lb/day) and a very small affected population, staff elected not to use the CARB methodology for using estimated PM_{2.5} emissions to derive a projected premature mortality number and explained why it would be inappropriate to do so. (*Id.* at pp 2-22 to 2-24.) SCAQMD staff concluded that use of this methodology for such a small source could result in unreliable findings and would not provide meaningful information. (*Id.* at pp. 2-23, 2-25.) This CEQA document was not challenged in court.

In the above case, while it may have been technically possible to plug the data into the methodology, the results would not have been reliable or meaningful. SCAQMD believes that an agency should not be required to perform analyses that do not produce reliable or meaningful results. This Court has already held that an agency may decline to use even the “normal” “existing conditions” CEQA baseline where to do so would be misleading or without informational value. (*Neighbors for Smart Rail v. Exposition Metro Line* (2013) 57 Cal.4th 439, 448, 457.) The same should be true for a decision that a particular study or analysis would not provide reliable or meaningful results.¹⁰

¹⁰ Whether a particular study would result in “informational value” is a part of deciding whether it is “feasible.” CEQA defines “feasible” as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and

Therefore, it is not possible to set a hard-and-fast rule on whether a correlation of air quality impacts with specific quantifiable health impacts is required in all cases. Instead, the result turns on whether such an analysis is reasonably feasible in the particular case.¹¹ Moreover, what is reasonably feasible may change over time as scientists and regulatory agencies continually seek to improve their ability to predict health impacts. For example, CARB staff has been directed by its Governing Board to reassess and improve the methodology for estimating premature deaths. (California Air Resources Board, *Health Impacts Analysis: PM Mortality Relationship*, <http://www.arb.ca.gov/research/health/pm-mort/pm-mort.htm> (last reviewed Dec. 29, 2010).) This factor also counsels against setting any hard-and-fast rule in this case.

III. THE QUESTION OF WHETHER AN EIR CONTAINS SUFFICIENT ANALYSIS TO MEET CEQA'S REQUIREMENTS IS A MIXED QUESTION OF FACT AND LAW GOVERNED BY TWO DIFFERENT STANDARDS OF REVIEW.

A. Standard of Review for Feasibility Determination and Sufficiency as an Informative Document

A second issue in this case is whether courts should review an EIR's informational sufficiency under the "substantial evidence" test as argued by Friant Ranch or the "independent judgment" test as argued by Sierra Club.

technological factors." (Pub. Resources Code § 21061.1.) A study cannot be "accomplished in a *successful* manner" if it produces unreliable or misleading results.

¹¹ In this case, the lead agency did not have an opportunity to determine whether the requested analysis was feasible because the comment was non-specific. Therefore, SCAQMD suggests that this Court, after resolving the legal issues in the case, direct the Court of Appeal to remand the case to the lead agency for a determination of whether the requested analysis is feasible. Because Fresno County, the lead agency, did not seek review in this Court, it seems likely that the County has concluded that at least some level of correlation of air pollution with health impacts is feasible.

As this Court has explained, “a reviewing court must adjust its scrutiny to the nature of the alleged defect, depending on whether the claim is predominantly one of improper procedure or a dispute over the facts.” (*Vineyard Area Citizens v. City of Rancho Cordova*, *supra*, 40 Cal.4th at 435.) For questions regarding compliance with proper procedure or other legal questions, courts review an agency’s action de novo under the “independent judgment” test. (*Id.*) On the other hand, courts review factual disputes only for substantial evidence, thereby “accord[ing] greater deference to the agency’s substantive factual conclusions.” (*Id.*)

Here, Friant Ranch and Sierra Club agree that the case involves the question of whether an EIR includes sufficient information regarding a project’s impacts. However, they disagree on the proper standard of review for answering this question: Sierra Club contends that courts use the independent judgment standard to determine whether an EIR’s analysis is sufficient to meet CEQA’s informational purposes,¹² while Friant Ranch contends that the substantial evidence standard applies to this question.

///

///

///

///

///

///

///

///

///

¹² Sierra Club acknowledges that courts use the substantial evidence standard when reviewing predicate factual issues, but argues that courts ultimately decide as a matter of law what CEQA requires. (Answering Brief, pp. 14, 23.)

SCAQMD submits that the issue is more nuanced than either party contends. We submit that, whether a CEQA document includes sufficient analysis to satisfy CEQA's informational mandates is a mixed question of fact and law,¹³ containing two levels of inquiry that should be judged by different standards.¹⁴

The state CEQA Guidelines set forth standards for the adequacy of environmental analysis. Guidelines Section 15151 states:

An EIR should be prepared with a sufficient degree of analysis to provide decision makers with information which enables them to make a decision which intelligently takes account of environmental consequences. An evaluation of the environmental effects of a proposed project need not be exhaustive, but the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible. Disagreement among experts does not make an EIR inadequate, but the EIR should summarize the main points of disagreement among the experts. The courts have looked not for perfection, but for adequacy, completeness, and a good-faith effort at full disclosure.

In this case, the basic question is whether the underlying analysis of air quality impacts made the EIR "sufficient" as an informative document. However, whether the EIR's analysis was sufficient is judged in light of what was reasonably feasible. This represents a mixed question of fact and law that is governed by two different standards of review.

¹³ Friant Ranch actually states that the claim that an EIR lacks sufficient relevant information is, "most properly thought of as raising mixed questions of fact and law." (Opening Brief, p. 27.) However, the remainder of its argument claims that the court should apply the substantial evidence standard of review to all aspects of the issue.

¹⁴ Mixed questions of fact and law issues may implicate predominantly factual subordinate questions that are reviewed under the substantial evidence test even though the ultimate question may be reviewed by the independent judgment test. *Crocker National Bank v. City and County of San Francisco* (1989) 49 Cal.3d 881, 888-889.

SCAQMD submits that an EIR's sufficiency as an informational document is ultimately a legal question that courts should determine using their independent judgment. This Court's language in *Laurel Heights I* supports this position. As this Court explained: "The court does not pass upon the correctness of the EIR's environmental conclusions, but only upon its *sufficiency as an informative document*." (*Laurel Heights I, supra*, 47 Cal.3d at 392-393) (emphasis added.) As described above, the Court in *Vineyard Area Citizens v. City of Rancho Cordova, supra*, 40 Cal.4th at 431, also used its independent judgment to determine what level of analysis CEQA requires for water supply impacts. The Court did not defer to the lead agency's opinion regarding the law's requirements; rather, it determined for itself what level of analysis was necessary to meet "[t]he law's informational demands." (*Id.* at p. 432.) Further, existing case law also holds that where an agency fails to comply with CEQA's information disclosure requirements, the agency has "failed to proceed in the manner required by law." (*Save Our Peninsula Comm. v. Monterey County Bd. of Supervisors* (2001) 87 Cal.App.4th 99, 118.)

However, whether an EIR satisfies CEQA's requirements depends in part on whether it was reasonably feasible for an agency to conduct additional or more thorough analysis. EIRs must contain "a detailed statement" of a project's impacts (Pub. Res. Code § 21061), and an agency must "use its best efforts to find out and disclose all that it reasonably can." (CEQA Guidelines § 15144.) Nevertheless, "the sufficiency of an EIR is to be reviewed in light of what is reasonably feasible." (CEQA Guidelines § 15151.)

SCAQMD submits that the question of whether additional analysis or a particular study suggested by a commenter is "feasible" is generally a question of fact. Courts have already held that whether a particular alternative is "feasible" is reviewed by the substantial evidence test.

(*Uphold Our Heritage v. Town of Woodside* (2007) 147 Cal.App.4th 587, 598-99; *Center for Biological Diversity v. County of San Bernardino* (2010) 185 Cal.App.4th 866, 883.) Thus, if a lead agency determines that a particular study or analysis is infeasible, that decision should generally be judged by the substantial evidence standard. However, SCAQMD urges this Court to hold that lead agencies must explain the basis of any determination that a particular analysis is infeasible in the EIR itself. An EIR must discuss information, including issues related to the feasibility of particular analyses “in sufficient detail to enable meaningful participation and criticism by the public. ‘[W]hatever is required to be considered in an EIR must be in that formal report; what any official might have known from other writings or oral presentations cannot supply what is lacking in the report.’” (*Laurel Heights I, supra*, 47 Cal.3d at p. 405 (quoting *Santiago County Water District v. County of Orange* (1981) 118 Cal.App.3d 818, 831) (discussing analysis of alternatives).) The evidence on which the determination is based should also be summarized in the EIR itself, with appropriate citations to reference materials if necessary. Otherwise commenting agencies such as SCAQMD would be forced to guess where the lead agency's evidence might be located, thus thwarting effective public participation.

Moreover, if a lead agency determines that a particular study or analysis would not result in reliable or useful information and for that reason is not feasible, that determination should be judged by the substantial evidence test. (See *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority, supra*, 57 Cal.4th 439, 448, 457:

whether “existing conditions” baseline would be misleading or uninformative judged by substantial evidence standard.¹⁵)

If the lead agency’s determination that a particular analysis or study is not feasible is supported by substantial evidence, then the agency has not violated CEQA’s information disclosure provisions, since it would be infeasible to provide additional information. This Court’s decisions provide precedent for such a result. For example, this Court determined that the issue of whether the EIR should have included a more detailed discussion of future herbicide use was resolved because substantial evidence supported the agency’s finding that “the precise parameters of future herbicide use could not be predicted.” *Ebbetts Pass Forest Watch v. California Dept. of Forestry & Fire Protection* (2008) 43 Cal.4th 936, 955.

Of course, SCAQMD expects that courts will continue to hold lead agencies to their obligations to consult with, and not to ignore or misrepresent, the views of sister agencies having special expertise in the area of air quality. (*Berkeley Keep Jets Over the Bay v. Board of Port Commissioners* (2007) 91 Cal.App.4th 1344, 1364 n.11.) In some cases, information provided by such expert agencies may establish that the purported evidence relied on by the lead agency is not in fact “substantial”. (*Id.* at pp. 1369-1371.)

In sum, courts retain ultimate responsibility to determine what CEQA requires. However, the law does not require exhaustive analysis, but only what is reasonably feasible. Agencies deserve deference for their factual determinations regarding what type of analysis is reasonably feasible. On the other hand, if a commenter requests more information, and the lead agency declines to provide it but does *not* determine that the

¹⁵ The substantial evidence standard recognizes that the courts "have neither the resources nor the scientific expertise" to weigh conflicting evidence on technical issues. (*Laurel Heights I, supra*, 47 Cal.3d 376, 393.)

requested study or analysis would be infeasible, misleading or uninformative, the question becomes whether the omission of that analysis renders the EIR inadequate to satisfy CEQA's informational purposes. (*Id.* at pp. 1370-71.) Again, this is predominantly a question of law and should be judged by the de novo or independent judgment standard of review. Of course, this Court has recognized that a "project opponent or reviewing court can always imagine some additional study or analysis that might provide helpful information. It is not for them to design the EIR. That further study...might be helpful does not make it necessary." (*Laurel Heights I, supra*, 47 Cal.3d 376, 415 – see also CEQA Guidelines § 15204(a) [CEQA "does not require a lead agency to conduct every test. . . recommended or demanded by commenters."].) Courts, then, must adjudicate whether an omission of particular information renders an EIR inadequate to serve CEQA's informational purposes.¹⁶

¹⁶ We recognize that there is case law stating that the substantial evidence standard applies to "challenges to the scope of an EIR's analysis of a topic" as well as the methodology used and the accuracy of the data relied on in the document "because these types of challenges involve factual questions." (*Bakersfield Citizens for Local Control v. City of Bakersfield, supra*, 124 Cal.App.4th 1184, 1198, and cases relied on therein.) However, we interpret this language to refer to situations where the question of the scope of the analysis really is factual—that is, where it involves whether further analysis is feasible, as discussed above. This interpretation is supported by the fact that the *Bakersfield* court expressly rejected an argument that a claimed "omission of information from the EIR should be treated as inquiries whether there is substantial evidence supporting the decision approving the project." *Bakersfield, supra*, 124 Cal.App.4th at p. 1208. And the *Bakersfield* court ultimately decided that the lead agency must analyze the connection between the identified air pollution impacts and resulting health impacts, even though the EIR already included some discussion of air-pollution-related respiratory illnesses. *Bakersfield, supra*, 124 Cal.App.4th at p. 1220. Therefore, the court must not have interpreted this question as one of the "scope of the analysis" to be judged by the substantial evidence standard.

B. Friant Ranch's Rationale for Rejecting the Independent Judgment Standard of Review is Unsupported by Case Law.

In its brief, Friant Ranch makes a distinction between cases where a required CEQA topic is not discussed at all (to be reviewed by independent judgment as a failure to proceed in the manner required by law) and cases where a topic is discussed, but the commenter claims the information provided is insufficient (to be judged by the substantial evidence test). (Opening Brief, pp. 13-17.) The Court of Appeal recognized these two types of cases, but concluded that both raised questions of law. (*Sierra Club v. County of Fresno* (2014) 226 Cal.App.4th 704 (superseded by grant of review) 172 Cal.Rptr.3d 271, 290.) We believe the distinction drawn by Friant Ranch is unduly narrow, and inconsistent with cases which have concluded that CEQA documents are insufficient. In many instances, CEQA's requirements are stated broadly, and the courts must interpret the law to determine what level of analysis satisfies CEQA's mandate for providing meaningful information, even though the EIR discusses the issue to some extent.

For example, the CEQA Guidelines require discussion of the existing environmental baseline. In *County of Amador v. El Dorado County Water Agency* (1999) 76 Cal.App.4th 931, 954-955, the lead agency had discussed the environmental baseline by describing historic month-end water levels in the affected lakes. However, the court held that this was not an adequate baseline discussion because it failed to discuss the timing and amounts of past actual water releases, to allow comparison with the proposed project. The court evidently applied the independent judgment test to its decision, even though the agency discussed the issue to some extent.

Likewise, in *Vineyard Area Citizens* (2007) 40 Cal.4th 412, this Court addressed the question of whether an EIR's analysis of water supply impacts complied with CEQA. The parties agreed that the EIR was required to analyze the effects of providing water to the development project, "and that in order to do so the EIR had, in some manner, to identify the planned sources of that water." (*Vineyard Area Citizens, supra*, at p. 428.) However, the parties disagreed as to the level of detail required for this analysis and "what level of uncertainty regarding the availability of water supplies can be tolerated in an EIR" (*Id.*) In other words, the EIR had analyzed water supply impacts for the project, but the petitioner claimed that the analysis was insufficient.

This Court noted that neither CEQA's statutory language or the CEQA Guidelines specifically addressed the question of how precisely an EIR must discuss water supply impacts. (*Id.*) However, it explained that CEQA "states that '[w]hile foreseeing the unforeseeable is not possible, an agency must use its best efforts to find out and disclose all that it reasonably can.'" (*Id.*, [Guidelines § 15144].) The Court used this general principle, along with prior precedent, to elucidate four "principles for analytical adequacy" that are necessary in order to satisfy "CEQA's informational purposes." (*Vineyard Area Citizens, supra*, at p. 430.) The Court did not defer to the agency's determination that the EIR's analysis of water supply impacts was sufficient. Rather, this Court used its independent judgment to determine for itself the level of analysis required to satisfy CEQA's fundamental purposes. (*Vineyard Area Citizens, supra*, at p. 441: an EIR does not serve its purposes where it neglects to explain likely sources of water and "... leaves long term water supply considerations to later stages of the project.")

Similarly, the CEQA Guidelines require an analysis of noise impacts of the project. (Appendix G, “Environmental Checklist Form.”¹⁷) In *Gray v. County of Madera* (2008) 167 Cal.App.4th 1099, 1123, the court held that the lead agency’s noise impact analysis was inadequate even though it had addressed the issue and concluded that the increase would not be noticeable. If the court had been using the substantial evidence standard, it likely would have upheld this discussion.

Therefore, we do not agree that the issue can be resolved on the basis suggested by Friant Ranch, which would apply the substantial evidence standard to *every* challenge to an analysis that addresses a required CEQA topic. This interpretation would subvert the courts’ proper role in interpreting CEQA and determining what the law requires.

Nor do we agree that the Court of Appeal in this case violated CEQA’s prohibition on courts interpreting its provisions “in a manner which imposes procedural or substantive requirements beyond those explicitly stated in this division or in the state guidelines.” (Pub. Resources Code § 21083.1.) CEQA requires an EIR to describe *all* significant impacts of the project on the environment. (Pub. Resources Code § 21100(b)(2); *Vineyard Area Citizens, supra*, at p. 428.) Human beings are part of the environment, so CEQA requires EIRs to discuss a project’s significant impacts on human health. However, except in certain particular circumstances,¹⁸ neither the CEQA statute nor Guidelines specify the precise level of analysis that agencies must undertake to satisfy the law’s requirements. (see, e.g., CEQA Guidelines § 15126.2(a) [EIRs must describe “health and safety problems caused by {a project’s} physical changes”].) Accordingly, courts must interpret CEQA as a whole to

¹⁷ Association of Environmental Professionals, 2015 CEQA Statute and Guidelines (2015) p.287.

¹⁸ E.g., Pub. Resources Code § 21151.8(C)(3)(B)(iii) (requiring specific type of health risk analysis for siting schools).

determine whether a particular EIR is sufficient as an informational document. A court determining whether an EIR's discussion of human health impacts is legally sufficient does not constitute imposing a new substantive requirement.¹⁹ Under Friant Ranch's theory, the above-referenced cases holding a CEQA analysis inadequate would have violated the law. This is not a reasonable interpretation.

IV. COURTS MUST SCRUPULOUSLY ENFORCE THE REQUIREMENTS THAT LEAD AGENCIES CONSULT WITH AND OBTAIN COMMENTS FROM AIR DISTRICTS

Courts must "scrupulously enforce" CEQA's legislatively mandated requirements. (*Vineyard Area Citizens, supra*, 40 Cal.4th 412, 435.) Case law has firmly established that lead agencies must consult with the relevant air pollution control district before conducting an initial study, and must provide the districts with notice of the intention to adopt a negative declaration (or EIR). (*Schenck v. County of Sonoma* (2011) 198 Cal.App.4th 949, 958.) As *Schenck* held, neither publishing the notice nor providing it to the State Clearinghouse was a sufficient substitute for sending notice directly to the air district. (*Id.*) Rather, courts "must be satisfied that [administrative] agencies have fully complied with the procedural requirements of CEQA, since only in this way can the important public purposes of CEQA be protected from subversion." *Schenck*, 198 Cal.App.4th at p. 959 (citations omitted).²⁰

¹⁹ We submit that Public Resources Code Section 21083.1 was intended to prevent courts from, for example, holding that an agency must analyze economic impacts of a project where there are no resulting environmental impacts (see CEQA Guidelines § 15131), or imposing new procedural requirements, such as imposing additional public notice requirements not set forth in CEQA or the Guidelines.

²⁰ Lead agencies must consult air districts, as public agencies with jurisdiction by law over resources affected by the project, *before* releasing an EIR. (Pub. Resources Code §§ 21104(a); 21153.) Moreover, air

Lead agencies should be aware, therefore, that failure to properly seek and consider input from the relevant air district constitutes legal error which may jeopardize their project approvals. For example, the court in *Fall River Wild Trout Foundation v. County of Shasta*, (1999) 70 Cal.App.4th 482, 492 held that the failure to give notice to a trustee agency (Department of Fish and Game) was prejudicial error requiring reversal. The court explained that the lack of notice prevented the Department from providing any response to the CEQA document. (*Id.* at p. 492.) It therefore prevented relevant information from being presented to the lead agency, which was prejudicial error because it precluded informed decision-making. (*Id.*)²¹

districts should be considered “state agencies” for purposes of the requirement to consult with “trustee agencies” as set forth in Public Resources Code § 20180.3(a). This Court has long ago held that the districts are not mere “local agencies” whose regulations are superseded by those of a state agency regarding matters of statewide concern, but rather have concurrent jurisdiction over such issues. (*Orange County Air Pollution Control District v. Public Util. Com.* (1971) 4 Cal.3d 945, 951, 954.) Since air pollution is a matter of statewide concern, *Id.* at 952, air districts should be entitled to trustee agency status in order to ensure that this vital concern is adequately protected during the CEQA process.

²¹ In *Schenck*, the court concluded that failure to give notice to the air district was not prejudicial, but this was partly because the trial court had already corrected the error before the case arrived at the Court of Appeal. The trial court issued a writ of mandate requiring the lead agency to give notice to the air district. The air district responded by concurring with the lead agency that air impacts were not significant. (*Schenck*, 198 Cal.App.4th 949, 960.) We disagree with the *Schenck* court that the failure to give notice to the air district would not have been prejudicial (even in the absence of the trial court writ) merely because the lead agency purported to follow the air district’s published CEQA guidelines for significance. (*Id.*, 198 Cal.App.4th at p. 960.) In the first place, absent notice to the air district, it is uncertain whether the lead agency properly followed those guidelines. Moreover, it is not realistic to expect that an air district’s published guidelines would necessarily fully address all possible air-quality related issues that can arise with a CEQA project, or that those

Similarly, lead agencies must obtain additional information requested by expert agencies, including those with jurisdiction by law, if that information is necessary to determine a project's impacts. (*Sierra Club v. State Bd. Of Forestry* (1994) 7 Cal.4th 1215, 1236-37.) Approving a project without obtaining that information constitutes a failure to proceed in the manner prescribed by CEQA. (*Id.* at p. 1236.)

Moreover, a lead agency can save significant time and money by consulting with the air district early in the process. For example, the lead agency can learn what the air district recommends as an appropriate analysis on the facts of its case, including what kinds of health impacts analysis may be available, and what models are appropriate for use. This saves the lead agency from the need to do its analysis all over again and possibly needing to recirculate the document after errors are corrected, if new significant impacts are identified. (CEQA Guidelines § 15088.5(a).) At the same time, the air district's expert input can help the lead agency properly determine whether another commenter's request for additional analysis or studies is reasonable or feasible. Finally, the air district can provide input on what mitigation measures would be feasible and effective.

Therefore, we suggest that this Court provide guidance to lead agencies reminding them of the importance of consulting with the relevant air districts regarding these issues. Otherwise, their feasibility decisions may be vulnerable to air district evidence that establishes that there is no substantial evidence to support the lead agency decision not to provide specific analysis. (*See Berkeley Keep Jets Over the Bay, supra*, 91 Cal.App.4th 1344, 1369-1371.)

guidelines would necessarily be continually modified to reflect new developments. Therefore we believe that, had the trial court not already ordered the lead agency to obtain the air district's views, the failure to give notice would have been prejudicial, as in *Fall River, supra*, 70 Cal.App.4th 482, 492.

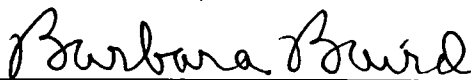
CONCLUSION

The SCAQMD respectfully requests this Court *not* to establish a hard-and-fast rule concerning whether CEQA requires a lead agency to correlate identified air quality impacts of a project with resulting health outcomes. Moreover, the question of whether an EIR is “sufficient as an informational document” is a mixed question of fact and law containing two levels of inquiry. Whether a particular proposed analysis is feasible is predominantly a question of fact to be judged by the substantial evidence standard of review. Where the requested analysis is feasible, but the lead agency relies on legal or policy reasons not to provide it, the question of whether the EIR is nevertheless sufficient as an informational document is predominantly a question of law to be judged by the independent judgment standard of review.

DATED: April 3, 2015

Respectfully submitted,

SOUTH COAST AIR QUALITY
MANAGEMENT DISTRICT
KURT R. WIESE, GENERAL COUNSEL
BARBARA BAIRD, CHIEF DEPUTY COUNSEL

By: 

Barbara Baird

Attorneys for Amicus Curiae

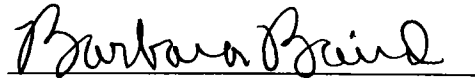
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.520(c)(1) of the California Rules of Court, I hereby certify that this brief contains 8,476 words, including footnotes, but excluding the Application, Table of Contents, Table of Authorities, Certificate of Service, this Certificate of Word Count, and signature blocks. I have relied on the word count of the Microsoft Word Vista program used to prepare this Certificate.

DATED: April 3, 2015

Respectfully submitted,


Barbara Baird

PROOF OF SERVICE

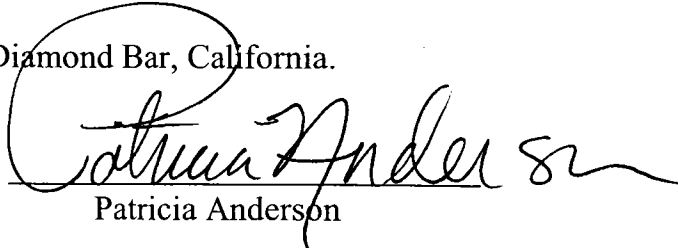
I am employed in the County of Los Angeles, California. I am over the age of 18 years and not a party to the within action. My business address is 21865 Copley Drive, Diamond Bar, California 91765.

On April 3, 2015 I served true copies of the following document(s) described as **APPLICATION OF THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT FOR LEAVE TO FILE BRIEF OF *AMICUS CURIAE* IN SUPPORT OF NEITHER PARTY AND [PROPOSED] BRIEF OF *AMICUS CURIAE*** by placing a true copy of the foregoing document(s) in a sealed envelope addressed as set forth on the attached service list as follows:

BY MAIL: I enclosed the document(s) in a sealed envelope or package addressed to the persons at the addresses listed in the Service List and placed the envelope for collection and mailing following our ordinary business practices. I am readily familiar with this District's practice for collection and processing of correspondence for mailing. Under that practice, the correspondence would be deposited with the United States Postal Service, with postage thereon fully prepaid at Diamond Bar, California, in the ordinary course of business. I am aware that on motion of the party served, service is presumed invalid if postal cancellation date or postage meter date is more than one day after date of deposit for mailing in affidavit.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on April 3, 2015 at Diamond Bar, California.


Patricia Anderson

SERVICE LIST

James G. Moose, Tiffany K. Wright,
Laura M. Harris
REMY MOOSE MANLEY, LLP
555 Capitol Mall, Suite 800
Sacramento, CA 95814

Attorneys for Real Party in
Interest and Respondent *Friant
Ranch, L.P.*

Bryan N. Wagner
WAGNER & WAGNER
7110 N. Fresno St, Suite 340
Fresno, CA 93720

Attorney for Real Party in Interest
and Respondent *Friant Ranch,
L.P.*

Sara Hedgpeth-Harris
LAW OFFICE OF SARA
HEDGPETH-HARRIS
5445 E. Lane Avenue
Fresno, CA 93727

Attorney for Plaintiffs and
Appellants *Sierra Club, et al*

Daniel C. Cederborg
Bruce B. Johnson, Jr.
Zachary Stephen Redmond
OFFICE OF THE FRESNO COUNTY
COUNSEL
2220 Tulare Street, Suite 500
Fresno, CA 93721

Attorneys for Respondents
County of Fresno

Clerk of the Court
California Court of Appeal
Fifth Appellate District
2424 Ventura Street
Fresno, CA 93721
(via U.S. Mail & Electronic Transmission)

Clerk of the Court
Superior Court of California
County of Fresno
1130 O Street
Fresno, CA 93721

SUPREME COURT COPY

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

SUPREME COURT
FILED

APR 13 2015

Frank A. McGuire Clerk
Deputy

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

**APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF
SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN
SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND
REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.**

CATHERINE T. REDMOND (State Bar No. 226957)
261 High Street
Duxbury, Massachusetts 02332
Tel. (339) 236-5720
Catherinetredmond22@gmail.com

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
Annette Ballatore-Williamson, District Counsel (State Bar. No. 192176)
1990 E. Gettysburg Avenue
Fresno, California 93726
Tel. (559) 230-6033
Annette.Ballatore-Williamson@valleyair.org

Counsel for San Joaquin Valley Unified Air Pollution Control District

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

**APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF
SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN
SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND
REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.**

CATHERINE T. REDMOND (State Bar No. 226957)
261 High Street
Duxbury, Massachusetts 02332
Tel. (339) 236-5720
Catherinetredmond22@gmail.com

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
Annette Ballatore-Williamson, District Counsel (State Bar. No. 192176)
1990 E. Gettysburg Avenue
Fresno, California 93726
Tel. (559) 230-6033
Annette.Ballatore-Williamson@valleyair.org

Counsel for San Joaquin Valley Unified Air Pollution Control District

APPLICATION

Pursuant to California Rules of Court 8.520(f)(1), proposed Amicus Curiae San Joaquin Valley Unified Air Pollution Control District hereby requests permission from the Chief Justice to file an amicus brief in support of Defendant and Respondent, County of Fresno, and Defendant and Real Parties in Interest Friant Ranch, L.P. Pursuant to Rule 8.520(f)(5) of the California Rules of Court, the proposed amicus curiae brief is combined with this Application. The brief addresses the following issue certified by this Court for review:

Is an EIR adequate when it identifies the health impacts of air pollution and quantifies a project's expected emissions, or does CEQA further require the EIR to *correlate* a project's air quality emissions to specific health impacts?

As of the date of this filing, the deadline for the final reply brief on the merits was March 5, 2015. Accordingly, under Rule 8.520(f)(2), this application and brief are timely.

1. Background and Interest of San Joaquin Valley Unified Air Pollution Control District

The San Joaquin Valley Unified Air Pollution Control District ("Air District") regulates air quality in the eight counties comprising the San Joaquin Valley ("Central Valley"): Kern, Tulare, Madera, Fresno, Merced, San Joaquin, Stanislaus, and Kings, and is primarily responsible for attaining air quality standards within its jurisdiction. After billions of dollars of investment by Central Valley businesses, pioneering air quality regulations, and consistent efforts by residents, the Central Valley air basin has made historic improvements in air quality.

The Central Valley's geographical, topographical and meteorological features create exceptionally challenging air quality

conditions. For example, it receives air pollution transported from the San Francisco Bay Area and northern Central Valley communities, and the southern portion of the Central Valley includes three mountain ranges (Sierra, Tehachapi, and Coastal) that, under some meteorological conditions, effectively trap air pollution. Central Valley air pollution is only a fraction of what the Bay Area and Los Angeles produce, but these natural conditions result in air quality conditions that are only marginally better than Los Angeles, even though about ten times more pollution is emitted in the Los Angeles region. Bay Area air quality is much better than the Central Valley's, even though the Bay Area produces about six times more pollution. The Central Valley also receives air pollution transported from the Bay Area and northern counties in the Central Valley, including Sacramento, and transboundary anthropogenic ozone from as far away as China.

Notwithstanding these challenges, the Central Valley has reduced emissions at the same or better rate than other areas in California and has achieved unparalleled milestones in protecting public health and the environment:

- In the last decade, the Central Valley became the first air basin classified by the federal government under the Clean Air Act as a “serious nonattainment” area to come into attainment of health-based National Ambient Air Quality Standard (“NAAQS”) for coarse particulate matter (PM₁₀), an achievement made even more notable given the Valley's extensive agricultural sector. Unhealthy levels of particulate matter can cause and exacerbate a range of chronic and acute illnesses.
- In 2013, the Central Valley became the first air basin in the country to improve from a federal designation of “extreme” nonattainment to

actually attain (and quality for an attainment designation) of the 1-hour ozone NAAQS; ozone creates “smog” and, like PM10, causes adverse health impacts.

- The Central Valley also is in full attainment of federal standards for lead, nitrogen dioxide, sulfur dioxide, and carbon monoxide.
- The Central Valley continues to make progress toward compliance with its last two attainment standards, with the number of exceedences for the 8-hour ozone NAAQS reduced by 74% (for the 1997 standard) and 38% (for the 2008 standard) since 1991, and for the small particulate matter (PM2.5) NAAQS reduced by 85% (for the 1997 standard) and 61% (for the 2006 standard).

Sustained improvement in Central Valley air quality requires a rigorous and comprehensive regulatory framework that includes prohibitions (e.g., on wood-burning fireplaces in new residences), mandates (e.g., requiring the installation of best available pollution reduction technologies on new and modified equipment and industrial operations), innovations (e.g., fees assessed against residential development to fund pollution reduction actions to “offset” vehicular emissions associated with new residences), incentive programs (e.g., funding replacements of older, more polluting heavy duty trucks and school buses)¹, ongoing planning for continued air quality improvements, and enforcement of Air District permits and regulations.

The Air District is also an expert air quality agency for the eight counties and cities in the San Joaquin Valley. In that capacity, the Air District has developed air quality emission guidelines for use by the Central

¹ San Joaquin’s incentive program has been so successful that through 2012, it has awarded over \$ 432 million in incentive funds and has achieved 93,349 tons of lifetime emissions reductions. See SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 2012 PM2.5 PLAN, 6-6 (2012) available at <http://www.valleyair.org/Workshops/postings/2012/12-20-12PM25/FinalVersion/06%20Chapter%206%20Incentives.pdf>.

Valley counties and cities that implement the California Environment Quality Act (CEQA).² In its guidance, the Air District has distinguished between toxic air contaminants and criteria air pollutants.³ Recognizing this distinction, the Air District's CEQA Guidance has adopted distinct thresholds of significance for *criteria* pollutants (i.e., ozone, PM2.5 and their respective precursor pollutants) based upon scientific and factual data which demonstrates the level that can be accommodated on a cumulative basis in the San Joaquin Valley without affecting the attainment of the applicable NAAQS.⁴ For *toxic air* pollutants, the District has adopted different thresholds of significance which scientific and factual data demonstrates has the potential to expose sensitive receptors (i.e., children, the elderly) to levels which may result in localized health impacts.⁵

The Air District's CEQA Guidance was followed by the County of Fresno in its environment review of the Friant Ranch project, for which the Air District also served as a commenting agency. The Court of Appeal's holding, however, requiring correlation between the project's criteria

² See, e.g., SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, PLANNING DIVISION, GUIDE FOR ASSESSING AND MITIGATING AIR QUALITY IMPACTS (2015), available at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf ("CEQA Guidance").

³ Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants regulated by the United States Environmental Protection Agency ("EPA") and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health, they are distinguishable from toxic air contaminants and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of toxic air contaminants occurs solely under section 112 of the Act. Compare 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 with 42 U.S.C. § 7411.

⁴ See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 64-66, 80.

⁵ See, e.g., CEQA Guidance at http://www.valleyair.org/transportation/GAMAQI_3-19-15.pdf, pp. 66, 99-101.

pollutants and local health impacts, departs from the Air District's Guidance and approved methodology for assessing criteria pollutants. A close reading of the administrative record that gave rise to this issue demonstrates that the Court's holding is based on a misunderstanding of the distinction between toxic air contaminants (for which a local health risk assessment is feasible and routinely performed) and criteria air pollutants (for which a local health risk assessment is not feasible and would result in speculative results).⁶ The Air District has a direct interest in ensuring the lawfulness and consistent application of its CEQA Guidance, and will explain how the Court of Appeal departed from the Air District's long-standing CEQA Guidance in addressing criteria pollutants and toxic air contaminants in this amicus brief.

2. How the Proposed Amicus Curiae Brief Will Assist the Court

As counsel for the proposed amicus curiae, we have reviewed the briefs filed in this action. In addition to serving as a "commentary agency" for CEQA purposes over the Friant Ranch project, the Air District has a strong interest in assuring that CEQA is used for its intended purpose, and believes that this Court would benefit from additional briefing explaining the distinction between criteria pollutants and toxic air contaminants and the different methodologies employed by local air pollution control agencies such as the Air District to analyze these two categories of air pollutants under CEQA. The Air District will also explain how the Court of Appeal's opinion is based upon a fundamental misunderstanding of these two different approaches by requiring the County of Fresno to correlate the project's *criteria* pollution emissions with *local* health impacts. In doing

⁶ CEQA does not require speculation. *See, e.g., Laurel Heights Improvement Ass'n v. Regents of Univ. of Cal.*, 6 Cal. 4th 1112, 1137 (1993) (upholding EIR that failed to evaluate cumulative toxic air emission increases given absence of any acceptable means for doing so).

so, the Air District will provide helpful analysis to support its position that at least insofar as criteria pollutants are concerned, CEQA does not require an EIR to correlate a project's air quality emissions to specific health impacts, because such an analysis is not reasonably feasible.

Rule 8.520 Disclosure

Pursuant to Cal. R. 8.520(f)(4), neither the Plaintiffs nor the Defendant or Real Party In Interest or their respective counsel authored this brief in whole or in part. Neither the Plaintiffs nor the Defendant or Real Party in Interest or their respective counsel made any monetary contribution towards or in support of the preparation of this brief.

CONCLUSION

On behalf of the San Joaquin Valley Unified Air Pollution Control District, we respectfully request that this Court accept the filing of the attached brief.

Dated: April 2, 2015



Annette A. Ballatore-Williamson
District Counsel
Attorney for Proposed Amicus Curiae

SAN JOAQUIN VALLEY UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CASE NO. S219783

IN THE SUPREME COURT OF CALIFORNIA

SIERRA CLUB, REVIVE THE SAN JOAQUIN, and
LEAGUE OF WOMEN VOTERS OF FRESNO,
Plaintiffs and Appellants

v.

COUNTY OF FRESNO,
Defendant and Respondent

FRIANT RANCH, L.P.,
Real Party in Interest and Respondent

After a Decision by the Court of Appeal, filed May 27, 2014
Fifth Appellate District Case No. F066798

Appeal from the Superior Court of California, County of Fresno
Case No. 11CECG00726

**AMICUS CURIAE BRIEF OF
SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN
SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO AND
REAL PARTY IN INTEREST AND RESPONDENT, FRIANT RANCH, L.P.**

CATHERINE T. REDMOND (State Bar No. 226957)
261 High Street
Duxbury, Massachusetts 02332
Tel. (339) 236-5720
Catherinetredmond22@gmail.com

SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT
Annette A. Ballatore-Williamson, District Counsel (State Bar. No. 192176)
1990 E. Gettysburg Avenue
Fresno, California 93726
Tel. (559) 230-6033
Annette.Ballatore-Williamson@valleyair.org
Counsel for San Joaquin Valley Unified Air Pollution Control District

TABLE OF CONTENTS

APPLICATION.....	1
1. Background and Interest of San Joaquin Valley Unified Air Pollution Control District.....	1
2. How the Proposed Amicus Curiae Brief Will Assist the Court	5
CONCLUSION.....	6
I. INTRODUCTION	1
II. THE COURT OF APPEAL ERRED IN FINDING THE FRIANT RANCH EIR INADEQUATE FOR FAILING TO ANALYZE THE SPECIFIC HUMAN HEALTH IMPACTS ASSOCIATED CRITERIA AIR POLLUTANTS.....	3
A, Currently Available Modeling Tools are not Equipped to Provide a Meaningful Analysis of the Correlation between an Individual Development Project’s Air Emissions and Specific Human Health Impacts.....	4
B. The Court of Appeal Improperly Extrapolated a Request for a Health Risk Assessment for Toxic Air Contaminants into a Requirement that the EIR contain an Analysis of Localized Health Impacts Associated with Criteria Air Pollutants	11
III. CONCLUSION.....	15
CERTIFICATE OF WORD COUNT.....	17

TABLE OF AUTHORITIES

CASES

<i>Bakersfield Citizens for Local Control v. City of Bakersfield</i> (2004) 124 Cal.App.4th 1184, 1199, 22 Cal.Rptr.3d 203	15
<i>Citizens for Responsible Equitable Environmental Development</i> <i>v. City of San Diego</i> , (2011) 196 Cal.App.4th 515, 527 129 Cal.Rptr.3d 512, 521	14
<i>Kings County Farm Bureau v. City of Hanford</i> (1990) 221 Cal.App.3d 692, 717 n. 8.	10
<i>Sierra Club v. City of Orange</i> (2008) 163 Cal.App.4 th 523, 535, 78 Cal.Rptr.3d 1, 13	14
<i>Sierra Club v. City of Orange</i> , 163 Cal.App.4 th at 536.....	15
<i>Sierra Club v. County of Fresno</i> (2014) 172 Cal.Rptr.3d 271, 306.....	12
<i>Sierra Club, supra</i> , 172 Cal.Rptr.3d at 303; AR 4554	8

FEDERAL STATUTES

United States Environmental Protection Agency (“EPA”) Clean Air Act. 42 U.S.C. § 7412	1,2,5,6
42 U.S.C. § 7412.....	1
U.S.C. §§ 7407 – 7411.....	1
U.S.C. §§ 7501 – 7515.....	1
42 U.S.C. § 7411.....	1
42 U.S.C. § 7412(b).....	1,2
42 U.S.C. § 7409(b)(1)	2, 6

CALIFORNIA STATUTES

California Environmental Quality Act (“CEQA”).....	<i>passim</i>
---	---------------

OTHER AUTHORITIES

United States Environmental Protection Agency,
Ground-level Ozone: Basic Information,
available at: <http://www.epa.gov/airquality/ozonepollution/basic.html>
(visited March 10, 015).....4

San Joaquin Valley Air Pollution Control District 2007 Ozone Plan,
Executive Summary p. ES-6, available at:
http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/03%20Executive%20Summary.pdf (visited March 10, 2015).....5

United States Environmental Protection Agency, *Particulate Matter: Basic Information*, available at:
<http://www.epa.gov/airquality/particlepollution/basic.html>
(visited March 10, 2015).....5

United States Environmental Protection Agency, *Table of National Ambient Air Quality Standards*, available at:
<http://www.epa.gov/air/criteria.html#3> (visited March 10, 2015) 6

San Joaquin Valley Unified Air Pollution Control District 2013 Plan for the Revoked 1-Hour Ozone Standard, Ch. 2 p. 2-16,
available at: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/02Chapter2ScienceTrendsModeling.pdf (visited March 10, 2015).....6

Ch. 2 p. 2-19 (visited March 12, 2015); *San Joaquin Valley Unified Air Pollution Control District 2008 PM2.5 Plan*,
Appendix F, pp. F-2 – F-5, available at:
http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Final_AdoptedPM2.5/2008/2008AppendixF/2008PM2.5AppendixF.pdf (visited March 10, 2015)

San Joaquin Valley Unified Air Pollution Control District Environmental Review Guidelines (Aug. 2000) p. 4-11, available at: http://www.valleyair.org/transportation/CEQA%20Rules/ERG%20Adopted%20_August%202000_.pdf (visited March 12, 2015).....8

San Joaquin Valley Unified Air Pollution Control District 2007 Ozone Plan, Appendix B pp. B-6, B-9, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/19%20Appendix%20B%20April%202007.pdf (visited March 12, 2015).....9

I. INTRODUCTION.

The San Joaquin Valley Unified Air Pollution Control District (“Air District”) respectfully submits that the Court of Appeal erred when it held that the air quality analysis contained in the Environmental Impact Report (“EIR”) for the Friant Ranch development project was inadequate under the California Environmental Quality Act (“CEQA”) because it did not include an analysis of the correlation between the project’s criteria air pollutants and the potential adverse human health impacts. A close reading of the portion of the administrative record that gave rise to this issue demonstrates that the Court’s holding is based on a misunderstanding of the distinction between toxic air contaminants and criteria air pollutants.

Toxic air contaminants, also known as hazardous air pollutants, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as birth defects. There are currently 189 toxic air contaminants (hereinafter referred to as “TACs”) regulated by the United States Environmental Protection Agency (“EPA”) and the states pursuant to the Clean Air Act. 42 U.S.C. § 7412. Common TACs include benzene, perchloroethylene and asbestos. *Id.* at 7412(b).

In contrast, there are only six (6) criteria air pollutants: ozone, particulate matter, carbon monoxide, nitrogen oxides, sulfur dioxide and lead. Although criteria air pollutants can also be harmful to human health,

they are distinguishable from TACs and are regulated separately. For instance, while criteria pollutants are regulated by numerous sections throughout Title I of the Clean Air Act, the regulation of TACs occurs solely under section 112 of the Act. *Compare* 42 U.S.C. §§ 7407 – 7411 & 7501 – 7515 *with* 42 U.S.C. § 7411.

The most relevant difference between criteria pollutants and TACs for purposes of this case is the manner in which human health impacts are accounted for. While it is common practice to analyze the correlation between an individual facility's TAC emissions and the expected localized human health impacts, such is not the case for criteria pollutants. Instead, the human health impacts associated with criteria air pollutants are analyzed and taken into consideration when EPA sets the national ambient air quality standard ("NAAQS") for each criteria pollutant. 42 U.S.C. § 7409(b)(1). The health impact of a particular criteria pollutant is analyzed on a regional and not a facility level based on how close the area is to complying with (attaining) the NAAQS. Accordingly, while the type of individual facility / health impact analysis that the Court of Appeal has required is a customary practice for TACs, it is not feasible to conduct a similar analysis for criteria air pollutants because currently available computer modeling tools are not equipped for this task.

It is clear from a reading of both the administrative record and the Court of Appeal's decision that the Court did not have the expertise to fully

appreciate the difference between TACs and criteria air pollutants. As a result, the Court has ordered the County of Fresno to conduct an analysis that is not practicable and not likely yield valid information. The Air District respectfully requests that this portion of the Court of Appeal's decision be reversed.

II. THE COURT OF APPEAL ERRED IN FINDING THE FRIANT RANCH EIR INADEQUATE FOR FAILING TO ANALYZE THE SPECIFIC HUMAN HEALTH IMPACTS ASSOCIATED CRITERIA AIR POLLUTANTS.

Although the Air District does not take lightly the amount of air emissions at issue in this case, it submits that the Court of Appeal got it wrong when it required Fresno County to revise the Friant Ranch EIR to include an analysis correlating the criteria air pollutant emissions associated with the project with specific, localized health-impacts. The type of analysis the Court of Appeal has required will not yield reliable information because currently available modeling tools are not well suited for this task. Further, in reviewing this issue de novo, the Court of Appeal failed to appreciate that it lacked the scientific expertise to appreciate the significant differences between a health risk assessment commonly performed for toxic air contaminants and a similar type of analysis it felt should have been conducted for criteria air pollutants.

///

///

A. Currently Available Modeling Tools are not Equipped to Provide a Meaningful Analysis of the Correlation between an Individual Development Project's Air Emissions and Specific Human Health Impacts.

In order to appreciate the problematic nature of the Court of Appeals' decision requiring a health risk type analysis for criteria air pollutants, it is important to understand how the relevant criteria pollutants (ozone and particulate matter) are formed, dispersed and regulated.

Ground level ozone (smog) is not directly emitted into the air, but is formed when precursor pollutants such as oxides of nitrogen (NO_x) and volatile organic compounds (VOCs) are emitted into the atmosphere and undergo complex chemical reactions in the process of sunlight.¹ Once formed, ozone can be transported long distances by wind.² Because of the complexity of ozone formation, a specific tonnage amount of NO_x or VOCs emitted in a particular area does not equate to a particular concentration of ozone in that area. In fact, even rural areas that have relatively low tonnages of emissions of NO_x or VOCs can have high levels of ozone concentration simply due to wind transport.³ Conversely, the San Francisco Bay Area has six times more NO_x and VOC emissions per square mile than the San Joaquin Valley, but experiences lower

¹ See United States Environmental Protection Agency, *Ground-level Ozone: Basic Information*, available at: <http://www.epa.gov/airquality/ozonepollution/basic.html> (visited March 10, 2015).

² *Id.*

³ *Id.*

concentrations of ozone (and better air quality) simply because sea breezes disperse the emissions.⁴

Particulate matter (“PM”) can be divided into two categories: directly emitted PM and secondary PM.⁵ While directly emitted PM can have a localized impact, the tonnage emitted does not always equate to the local PM concentration because it can be transported long distances by wind.⁶ Secondary PM, like ozone, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur dioxides (SO_x) and NO_x.⁷ Because of the complexity of secondary PM formation, the tonnage of PM-forming precursor emissions in an area does not necessarily result in an equivalent concentration of secondary PM in that area.

The disconnect between the *tonnage* of precursor pollutants (NO_x, SO_x and VOCs) and the *concentration* of ozone or PM formed is important because it is not necessarily the tonnage of precursor pollutants that causes human health effects, but the concentration of resulting ozone or PM. Indeed, the national ambient air quality standards (“NAAQS”), which are statutorily required to be set by the United States Environmental Protection

⁴ *San Joaquin Valley Air Pollution Control District 2007 Ozone Plan*, Executive Summary p. ES-6, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/03%20Executive%20Summary.pdf (visited March 10, 2015).

⁵ United States Environmental Protection Agency, *Particulate Matter: Basic Information*, available at: <http://www.epa.gov/airquality/particlepollution/basic.html> (visited March 10, 2015).

⁶ *Id.*

⁷ *Id.*

Agency (“EPA”) at levels that are “requisite to protect the public health,” 42 U.S.C. § 7409(b)(1), are established as concentrations of ozone or particulate matter and not as tonnages of their precursor pollutants.⁸

Attainment of a particular NAAQS occurs when the concentration of the relevant pollutant remains below a set threshold on a consistent basis throughout a particular region. For example, the San Joaquin Valley attained the 1-hour ozone NAAQS when ozone concentrations remained at or below 0.124 parts per million Valley-wide on 3 or fewer days over a 3-year period.⁹ Because the NAAQS are focused on achieving a particular concentration of pollution region-wide, the Air District’s tools and plans for attaining the NAAQS are regional in nature.

For instance, the computer models used to simulate and predict an attainment date for the ozone or particulate matter NAAQS in the San Joaquin Valley are based on regional inputs, such as regional inventories of precursor pollutants (NO_x, SO_x and VOCs) and the atmospheric chemistry and meteorology of the Valley.¹⁰ At a very basic level, the models simulate future ozone or PM levels based on predicted changes in precursor

⁸ See, e.g., United States Environmental Protection Agency, *Table of National Ambient Air Quality Standards*, available at: <http://www.epa.gov/air/criteria.html#3> (visited March 10, 2015).

⁹ *San Joaquin Valley Unified Air Pollution Control District 2013 Plan for the Revoked 1-Hour Ozone Standard*, Ch. 2 p. 2-16, available at: http://www.valleyair.org/Air_Quality_Plans/OzoneOneHourPlan2013/02Chapter2ScienceTrendsModeling.pdf (visited March 10, 2015).

¹⁰ *Id.* at Ch. 2 p. 2-19 (visited March 12, 2015); *San Joaquin Valley Unified Air Pollution Control District 2008 PM_{2.5} Plan*, Appendix F, pp. F-2 – F-5, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Final_Adopted_PM2.5/20%20Appendix%20F.pdf (visited March 19, 2015).

emissions Valley wide.¹¹ Because the NAAQS are set levels necessary to protect human health, the closer a region is to attaining a particular NAAQS, the lower the human health impact is from that pollutant.

The goal of these modeling exercises is not to determine whether the emissions generated by a particular factory or development project will affect the date that the Valley attains the NAAQS. Rather, the Air District's modeling and planning strategy is regional in nature and based on the extent to which *all* of the emission-generating sources in the Valley (current and future) must be controlled in order to reach attainment.¹²

Accordingly, the Air District has based its thresholds of significance for CEQA purposes on the levels that scientific and factual data demonstrate that the Valley can accommodate without affecting the attainment date for the NAAQS.¹³ The Air District has tied its CEQA significance thresholds to the level at which stationary pollution sources permitted by the Air District must "offset" their emissions.¹⁴ This "offset"

¹¹ *Id.*

¹² Although the Air District does have a dispersion modeling tool used during its air permitting process that is used to predict whether a particular project's directly emitted PM will either cause an exceedance of the PM NAAQS or contribute to an existing exceedance, this model bases the prediction on a worst case scenario of emissions and meteorology and has no provision for predicting any associated human health impacts. Further, this analysis is only performed for stationary sources (factories, oil refineries, etc.) that are required to obtain a New Source Review permit from the Air District and not for development projects such as Friant Ranch over which the Air District has no preconstruction permitting authority. See San Joaquin Valley Unified Air Pollution Control District Rule 2201 §§ 2.0; 3.3.9; 4.14.1, available at: <http://www.valleyair.org/rules/curnrules/Rule22010411.pdf> (visited March 19, 2015).

¹³ *San Joaquin Valley Unified Air Pollution Control District Guide to Assessing and Mitigating Air Quality Impacts*, (March 19, 2015) p. 22, available at: <http://www.valleyair.org/transportation/CEQA%20Rules/GAMAQI%20Jan%202002%20Rev.pdf> (visited March 30, 2015).

¹⁴ *Id.* at pp. 22, 25.

level allows for growth while keeping the cumulative effects of all new sources at a level that will not impede attainment of the NAAQS.¹⁵ In the Valley, these thresholds are 15 tons per year of PM, and 10 tons of NOx or VOC per year. *Sierra Club, supra*, 172 Cal.Rptr.3d at 303; AR 4554. Thus, the CEQA air quality analysis for criteria pollutants is not really a localized, project-level impact analysis but one of regional, “cumulative impacts.”

Accordingly, the significance thresholds applied in the Friant Ranch EIR (15 tons per year of PM and 10 tons of NOx or VOCs) are not intended to be indicative of any localized human health impact that the project may have. While the health effects of air pollution are of primary concern to the Air District (indeed, the NAAQS are established to protect human health), the Air District is simply not equipped to analyze whether and to what extent the criteria pollutant emissions of an individual CEQA project directly impact human health in a particular area. This is true even for projects with relatively high levels of emissions of criteria pollutant precursor emissions.

For instance, according to the EIR, the Friant Ranch project is estimated to emit 109.52 tons per year of ROG (VOC), 102.19 tons per year of NOx, and 117.38 tons per year of PM. Although these levels well

¹⁵ ¹⁵ *San Joaquin Valley Unified Air Pollution Control District Environmental Review Guidelines* (Aug. 2000) p. 4-11, available at: http://www.valleyair.org/transportation/CEQA%20Rules/ERG%20Adopted%20_August%202000_.pdf (visited March 12, 2015).

exceed the Air District's CEQA significance thresholds, this does not mean that one can easily determine the concentration of ozone or PM that will be created at or near the Friant Ranch site on a particular day or month of the year, or what specific health impacts will occur. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM. This is especially true for a project like Friant Ranch where most of the criteria pollutant emissions derive not from a single "point source," but from area wide sources (consumer products, paint, etc.) or mobile sources (cars and trucks) driving to, from and around the site.

In addition, it would be extremely difficult to model the impact on NAAQS attainment that the emissions from the Friant Ranch project may have. As discussed above, the currently available modeling tools are equipped to model the impact of *all* emission sources in the Valley on attainment. According to the most recent EPA-approved emission inventory, the NO_x inventory for the Valley is for the year 2014 is 458.2 tons per day, or 167,243 tons per year and the VOC (or ROG) inventory is 361.7 tons per day, or 132,020.5 tons per year.¹⁶ Running the photochemical grid model used for predicting ozone attainment with the

¹⁶ *San Joaquin Valley Unified Air Pollution Control District 2007 Ozone Plan*, Appendix B pp. B-6, B-9, available at: http://www.valleyair.org/Air_Quality_Plans/docs/AQ_Ozone_2007_Adopted/19%20Appendix%20B%20April%202007.pdf (visited March 12, 2015).

emissions solely from the Friant Ranch project (which equate to less than one-tenth of one percent of the total NOx and VOC in the Valley) is not likely to yield valid information given the relative scale involved.

Finally, even once a model is developed to accurately ascertain local increases in concentrations of photochemical pollutants like ozone and some particulates, it remains impossible, using today's models, to correlate that increase in concentration to a specific health impact. The reason is the same: such models are designed to determine regional, population-wide health impacts, and simply are not accurate when applied at the local level.

For these reasons, it is not the norm for CEQA practitioners, including the Air District, to conduct an analysis of the localized health impacts associated with a project's criteria air pollutant emissions as part of the EIR process. When the accepted scientific method precludes a certain type of analysis, "the court cannot impose a legal standard to the contrary." *Kings County Farm Bureau v. City of Hanford* (1990) 221 Cal.App.3d 692, 717 n. 8. However, that is exactly what the Court of Appeal has done in this case. Its decision upends the way CEQA air quality analysis of criteria pollutants occurs and should be reversed.

///

///

///

B. The Court of Appeal Improperly Extrapolated a Request for a Health Risk Assessment for Toxic Air Contaminants into a Requirement that the EIR contain an Analysis of Localized Health Impacts Associated with Criteria Air Pollutants.

The Court of Appeal's error in requiring the new health impact analysis for criteria air pollutants clearly stems from a misunderstanding of terms of art commonly used in the air pollution field. More specifically, the Court of Appeal (and Appellants Sierra Club et al.) appear to have confused the health risk analysis ("HRA") performed to determine the health impacts associated with a project's toxic air contaminants ("TACs"), with an analysis correlating a project's criteria air pollutants (ozone, PM and the like) with specific localized health impacts.

The first type of analysis, the HRA, is commonly performed during the Air District's stationary source permitting process for projects that emit TACs and is, thus, incorporated into the CEQA review process. An HRA is a comprehensive analysis to evaluate and predict the dispersion of TACs emitted by a project and the potential for exposure of human populations. It also assesses and quantifies both the individual and population-wide health risks associated with those levels of exposure. There is no similar analysis conducted for criteria air pollutants. Thus, the second type of analysis (required by the Court of Appeal), is not currently part of the Air District's process because, as outlined above, the health risks associated

with exposure to criteria pollutants are evaluated on a regional level based on the region's attainment of the NAAQS.

The root of this confusion between the types of analyses conducted for TACs versus criteria air pollutants appears to stem from a comment that was presented to Fresno County by the City of Fresno during the administrative process.

In its comments on the draft EIR, the City of Fresno (the only party to raise this issue) stated:

[t]he EIR must disclose the human health related effects of the Project's air pollution impacts. (CEQA Guidelines section 15126.2(a).) The EIR fails completely in this area. The EIR should be revised to disclose and determine the significance of TAC impacts, and of human health risks due to exposure to Project-related air emissions.

(AR 4602.)

In determining that the issue regarding the correlation between the Friant Ranch project's criteria air pollutants and adverse health impacts was adequately exhausted at the administrative level, the Court of Appeal improperly read the first two sentences of the City of Fresno's comment in isolation rather than in the context of the entire comment. *See Sierra Club v. County of Fresno* (2014) 172 Cal.Rptr.3d 271, 306. Although the comment first speaks generally in terms of "human health related effects" and "air pollution," it requests only that the EIR be revised to disclose "the significance of TACs" and the "human health risks due to exposure."

The language of this request in the third sentence of the comment is significant because, to an air pollution practitioner, the language would only have indicated only that a HRA for TACs was requested, and not a separate analysis of the health impacts associated with the project's criteria air pollutants. Fresno County clearly read the comment as a request to perform an HRA for TACs and limited its response accordingly. (AR 4602.)¹⁷ The Air District submits that it would have read the City's comment in the same manner as the County because the City's use of the terms "human health risks" and "TACs" signal that an HRA for TACs is being requested. Indeed, the Air District was also concerned that an HRA be conducted, but understood that it was not possible to conduct such an analysis until the project entered the phase where detailed site specific information, such as the types of emission sources and the proximity of the sources to sensitive receptors became available. (AR 4553.)¹⁸ The City of Fresno was apparently satisfied with the County's discussion of human health risks, as it did not raise the issue again when it commented on the final EIR. (AR 8944 – 8960.)

¹⁷ Appellants do not challenge the manner in which the County addressed TACs in the EIR. (Appellants' Answer Brief p. 28 fn. 7.)

¹⁸ Appellants rely on the testimony of Air District employee, Dan Barber, as support for their position that the County should have conducted an analysis correlating the project's criteria air pollutant emissions with localized health impacts. (Appellants Answer Brief pp. 10-11; 28.) However, Mr. Barber's testimony simply reinforces the Air District's concern that a risk assessment (HRA) be conducted once the actual details of the project become available. (AR 8863.) As to criteria air pollutants, Mr. Barber's comments are aimed at the Air District's concern about the amount of emissions and the fact that the emissions will make it "more difficult for Fresno County and the Valley to reach attainment which means that the health of Valley residents maybe [sic] adversely impacted." Mr. Barber says nothing about conducting a separate analysis of the localized health impacts the project's emissions may have.

The Court of Appeal's holding, which incorrectly extrapolates a request for an HRA for TACs into a new analysis of the localized health impacts of the project's criteria air pollutants, highlights two additional errors in the Court's decision.

First, the Court of Appeal's holding illustrates why the Court should have applied the deferential substantial evidence standard of review to the issue of whether the EIR's air quality analysis was sufficient. The regulation of air pollution is a technical and complex field and the Court of Appeal lacked the expertise to fully appreciate the difference between TACs and criteria air pollutants and tools available for analyzing each type of pollutant.

Second, it illustrates that the Court likely got it wrong when it held that the issue regarding the criteria pollutant / localized health impact analysis was properly exhausted during the administrative process. In order to preserve an issue for the court, '[t]he "exact issue" must have been presented to the administrative agency....' [Citation.] *Citizens for Responsible Equitable Environmental Development v. City of San Diego*, (2011) 196 Cal.App.4th 515, 527 129 Cal.Rptr.3d 512, 521; *Sierra Club v. City of Orange* (2008) 163 Cal.App.4th 523, 535, 78 Cal.Rptr.3d 1, 13. "[T]he objections must be sufficiently specific so that the agency has the

opportunity to evaluate and respond to them.’ [Citation.]” *Sierra Club v. City of Orange*, 163 Cal.App.4th at 536.¹⁹

As discussed above, the City’s comment, while specific enough to request a commonly performed HRA for TACs, provided the County with no notice that it should perform a new type of analysis correlating criteria pollutant tonnages to specific human health effects. Although the parties have not directly addressed the issue of failure to exhaust administrative remedies in their briefs, the Air District submits that the Court should consider how it affects the issues briefed by the parties since “[e]xhaustion of administrative remedies is a jurisdictional prerequisite to maintenance of a CEQA action.” *Bakersfield Citizens for Local Control v. City of Bakersfield* (2004) 124 Cal.App.4th 1184, 1199, 22 Cal.Rptr.3d 203.

III. CONCLUSION

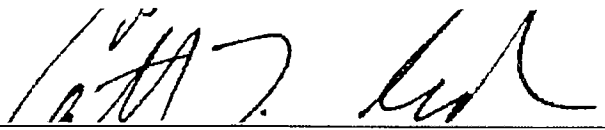
For all of the foregoing reasons, the Air District respectfully requests that the portion of the Court of Appeal’s decision requiring an analysis correlating the localized human health impacts associated with an individual project’s criteria air pollutant emissions be reversed.

¹⁹ *Sierra Club v. City of Orange*, is illustrative here. In that case, the plaintiffs challenged an EIR approved for a large planned community on the basis that the EIR improperly broke up the various environmental impacts by separate project components or “piecemealed” the analysis in violation of CEQA. In evaluating the defense that the plaintiffs had failed to adequately raise the issue at the administrative level, the Court held that comments such as “the use of a single document for both a project-level and a program-level EIR [is] ‘confusing’,” and “[t]he lead agency should identify any potential adverse air quality impacts that could occur from all phases of the project and all air pollutant sources related to the project,” were too vague to fairly raise the argument of piecemealing before the agency. *Sierra Club v. City of Orange*, 163 Cal.App.4th at 537.

correlating the localized human health impacts associated with an individual project's criteria air pollutant emissions be reversed.

Respectfully submitted,

Dated: April 2, 2015

A handwritten signature in black ink, appearing to read 'C. Redmond', is written over a horizontal line.

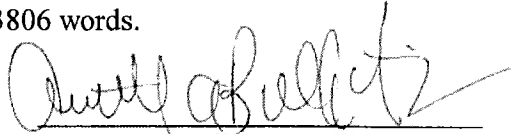
Catherine T. Redmond
Attorney for Proposed Amicus
Curiae

SAN JOAQUIN VALLEY
UNIFIED
AIR POLLUTION CONTROL
DISTRICT

CERTIFICATE OF WORD COUNT

Pursuant to Rule 8.204 of the California Rules of Court, I hereby certify that this document, based on the Word County feature of the Microsoft Word software program used to compose and print this document, contains, exclusive of caption, tables, certificate of word count, signature block and certificate of service, 3806 words.

Dated: April 2, 2015

A handwritten signature in cursive script, appearing to read "Annette A. Ballatore-Williamson", written over a horizontal line.

Annette A. Ballatore-Williamson
District Counsel (SBN 192176)

Sierra Club et al, v. County of Fresno, et al
Supreme Court of California Case No.: S219783
Fifth District Court of Appeal Case No.: F066798
Fresno County Superior Court Case No.: 11CECG00726

PROOF OF SERVICE

I am over the age of 18 years and not a party to the above-captioned action; that my business address is San Joaquin Valley Unified Air Pollution Control District located at 1990 E. Gettysburg Avenue, Fresno, California 93726.

On April 2, 2015, I served the document described below:

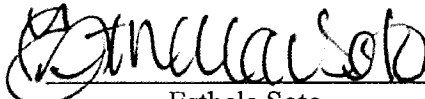
**APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF
SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN
SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO**

On all parties to this action at the following addresses and in the following manner:

PLEASE SEE ATTACHED SERVICE LIST

- (XX) **(BY MAIL)** I caused a true copy of each document(s) to be laced in a sealed envelope with first-class postage affixed and placed the envelope for collection. Mail is collected daily at my office and placed in a United State Postal Service collection box for pick-up and delivery that same day.
- () **(BY ELECTRONIC MAIL)** I caused a true and correct scanned image (.PDF file) copy to be transmitted via electronic mail transfer system in place at the San Joaquin Valley Unified Air Pollution Control District ("District"), originating from the undersigned at 1990 E. Gettysburg Avenue, Fresno, CA, to the address(es) indicated below.
- () **(BY OVERNIGHT MAIL)** I caused a true and correct copy to be delivered via Federal Express to the following person(s) or their representative at the address(es) listed below.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that I executed this document on April 2, 2015, at Fresno, California.



Esthela Soto

SERVICE LIST

Sierra Club et al, v. County of Fresno, et al

Supreme Court of California Case No.: S219783

Fifth District Court of Appeal Case No.: F066798

Fresno County Superior Court Case No.: 11CECG00726

Sara Hedgpeth-Harris, Esq. LAW OFFICE OF SARA HEDGPETH-HARRIS 2125 Kern Street, Suite 301 Fresno, California 93721 Telephone: (559) 233-0907 Facsimile: (559) 272-6046 Email: sara.hedgpethharris@shh-law.com	Attorney for Plaintiffs and Appellants, Sierra Club, et al
Daniel C. Cederborg, Esq. Bruce B. Johnson, Jr., Esq. OFFICE OF THE FRESNO COUNTY COUNSEL 2220 Tulare Street, Suite 500 Fresno, California 93721 Telephone: (559) 600-3479 Facsimile: (559) 600-3480 Email: bjohnson@co.fresno.ca.us	Attorneys for Defendant and Respondent, County of Fresno
Bryan N. Wagner, Esq. WAGNER & WAGNER 7110 N. Fresno Street, Suite 340 Fresno, California 93720 Telephone: (559) 224-0871 Facsimile: (559) 224-0885 Email: bryan@wagnerandwagner.com	Attorneys for Real Party in Interest/Respondent Friant Ranch, L.P.
Clerk of the Court Superior Court of California County of Fresno 1130 'O' Street Fresno, California 93721 Telephone: (559) 457-1900	
Clerk of the Court Fifth District Court of Appeal 2424 Ventura Street Fresno, California 93721 Telephone: (559) 445-5491	

R. Tyson Sohagim, Esq. THE SOHAGI LAW GROUP 11999 San Vicente Blvd., Suite 150 Los Angeles, California 90049 Telephone: (310) 475-5700 Facsimile: (310) 475-5707 Email: tsohagi@sohagi.com	Attorney for Amici Curiae; League of California Cities, and the California State Association of Counties
Marcia L. Scully, Esq. General Counsel METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA Post Office Box 54153 Los Angeles, California 90054 Telephone: (213) 217-6115	Attorney for Amicus Curiae, The Metropolitan Water District of Southern CA
Amy Minter, Esq. CHATEN-BROWN & CARSTENS LLP 2200 Pacific Coast Highway, Suite 318 Hermosa Beach, California 90254 Telephone: (310) 798-2400 Facsimile: (310) 798-2402 Email: ACM@CBCEarthlaw.com	Attorney for Amici Curiae, Association of Irrigated Residents, Medical Advocates for Healthy Air, and Coalition for Clean Air
Shanda M. Beltran, Esq. General Counsel BUILDING INDUSTRY LEGAL DEFENSE FOUNDATION 17744 Sky Park Cr., Suite 170 Irvine, California 92614 Telephone: (949) 553-9500 Facsimile: (949) 769-8943 Email: sbeltran@biasec.org	Attorney for Amicus Curiae, Building Industry Legal Defense Foundation
Gene Talmadge, President CALIFORNIA ASSOCIATION OF ENVIRONMENTAL PROFESSIONALS 40747 Baranda Court Palm Desert, California 92260 Telephone: (760) 340-4499 Facsimile: (760) 674-2479	Attorney for Amicus Curiae, California Association of Environmental Professionals
Jennifer L. Hernandez, Esq. HOLLAND & KNIGHT LLP 50 California Street, Suite 2800 San Francisco, California 94111	On behalf of Amicus Curiae, CEQA Research Council

Telephone: (415) 743-6927 Facsimile: (415) 743-6910 Email: Jennifer.hernandez@hklaw.com	
---	--

We Can Model Regional Emissions, But Are the Results Meaningful for CEQA?

Authors: AEP Climate Change Committee (Michael Hendrix, Dave Mitchell, Haseeb Qureshi, Jennifer Reed, Brian Schuster, Nicole Vermilion, and Rich Walters)

On December 24, 2018, the California Supreme Court, *Sierra Club v. County of Fresno (Friant Ranch, L.P.)* (2018) 6 Cal.5th 502, Case No. S219783 (*Friant Ranch*), held that simply identifying that a project exceeds an emissions threshold is not sufficient to identify a project's significant effect on the environment relative to the health effects of project emissions. The Court found that an EIR should make a reasonable effort to substantively connect a project's criteria pollutant emissions to likely health consequences, or explain why it is not currently feasible to provide such an analysis. In 2019, there were several CEQA documents that included health effects modeling to provide additional analysis for projects with criteria air pollutant emissions that exceed a significance threshold. While it is technically possible to conduct this modeling, we argue that this additional layer of quantitative analysis may not always provide decision-makers and the public with additional meaningful information. It is the air districts that are best suited to provide frameworks for how to identify health effects of regional criteria pollutant emissions under CEQA.

Introduction

Significance thresholds for regional criteria pollutants used by California air districts and lead agencies represent the maximum emissions from a project that are not expected to cause or contribute to an exceedance of the most stringent applicable national or state ambient air quality standard (AAQS). By analyzing the project's emissions against these thresholds, the CEQA document assesses whether these emissions directly contribute to any regional or local exceedances of the applicable AAQS and exposure levels. The basis of the ruling in *Friant Ranch* was that the EIR did not provide a meaningful analysis of the adverse health effects that would be associated with the project's criteria pollutant emissions, which were identified as being far above the relevant thresholds. The discussion of the adverse health effects in the EIR was general in nature and did not connect the levels of the pollutants that would be emitted by the project to adverse health effects.

The process of correlating project-related criteria pollutant emissions to health-based consequences is called a health impact assessment (HIA). An HIA involves two steps: 1) running a regional photochemical grid model (PGM) to estimate the small increases in concentrations of ozone and particulate matter (PM) in the region as a result of a project's emissions of criteria and precursor pollutants; and 2) running the U.S. EPA Benefits Mapping and Analysis Program (BenMAP) to estimate the resulting health impacts from these increases in concentrations of ozone and PM.

Limitations of Regional-Scale Dispersion Models

It is technically feasible to conduct regional-scale criteria pollutant modeling for a development project. Particulate matter (PM) can be divided into two categories: directly emitted PM and secondary PM. Secondary PM, is formed via complex chemical reactions in the atmosphere between precursor chemicals such as sulfur oxides (SO_x) and NO_x. Ozone (O₃) is a secondary pollutant formed from the oxidation of reactive organic gases (ROGs) and nitrogen oxides (NO_x) in the presence of sunlight. Rates of ozone formation are a function of a variety of complex physical factors, including the presence of sunlight and precursor pollutants, natural topography, nearby structures that cause building downwash, atmospheric stability, and wind patterns. Secondary formation of PM and ozone can occur far from the original emissions source from regional transport due to wind and topography (e.g. low-level jet stream). As such, modeling concentrations of secondary PM and ozone require photochemical grid models (PGMs), such as CMAQ and CAMx. These models have a much larger "grid" system and much lower resolution than localized dispersion modeling (e.g., AERMOD). For example, common grid cells in PGMs are 4x4 kilometers, while AERMOD can identify concentrations at the meter-level.

Photochemical modeling also depends on all emission sources in the entire domain. Low resolution and spatial averaging produces “noise” and model uncertainty that can exceed a project’s specific emissions. Additionally, regional-scale models are highly contingent upon background concentrations. Factors such as meteorology and topography greatly affect the certainty levels of predicted concentrations at receptor points. As a result, there are statistical ranges of uncertainty through all the modeling steps. Due to these factors, it is difficult to predict ground-level secondary PM and ozone concentrations associated with relatively small emission sources with a high degree of certainty. While it is possible to use a regional-scale model to predict these regional concentrations, when a project’s emissions are less than the regional model’s resolution, the resultant ambient air quality concentrations will be within the margin of uncertainty. In CEQA terms, this would fit the definition of “speculative”. Only when the scale of emissions would result in changes in ambient air quality beyond the model margin of uncertainty would the results not be “speculative” as defined by CEQA.

Identifying Health Effects due to Ambient Air Quality Changes

BenMap is a model developed by the USEPA to understand the health effects from changes in ozone and PM concentrations. If there is an acceptable level of confidence that the results provided by the regional dispersion modeling are valid, then these concentrations can be translated into health outcomes using BenMap. The health outcomes in BenMap are based on changes in ambient air concentrations and the population exposed to these changes. Data provided by this analysis may indicate increased number of workdays lost to illness, hospital admissions (respiratory), emergency room visits (asthma), or mortality, among other health effects. These are called “health incidences.”

Translating the incremental increase in PM and ozone concentrations to specific health effects is also subject to uncertainty. For example, regional models assign the same toxicity to PM regardless of the source of PM (such as road dust as exhaust), and thus potentially overpredict adverse health effects of PM. BenMap also assumes that health effects can occur at any concentration, including small incremental concentrations, and assumes that impacts seen at large concentration differences can be linearly scaled down to small increases in concentration, with no consideration of potential thresholds below which health impacts may not occur. Additionally, BenMap is used for assessing impacts over large areas and populations and was not intended to be used for individual projects. For health incidences, the number of hospitalizations or increase in morbidity predicted by BenMap is greatly affected by the population characteristics.¹ Small increases in emissions in an area with a high population have a much greater affect than large increases in emissions over an area with a small population. As a result, the same amount of emissions generated in an urban area could result in greater health consequences than if the same emissions occurred on the urban periphery, where fewer people may be affected. This will also depend on other factors including meteorology and photochemistry, as discussed above. Emissions in areas with conditions that favor high air dispersion or unfavorable ozone formation will likely have relatively lower effects on ambient air quality and health outcomes.

While BenMap provides additional statistical information about health consequences requested by the Court in the Friant Ranch decision, this information is only meaningful when presented with the full health context of the region or locality at hand. For example, if the BenMap analysis says that the project would result in two additional hospital admissions, this result alone is not useful unless one identifies how many hospital admissions are caused by poor air quality now (without the project) and how many hospital admissions occur

¹ BenMap assigns prevalence rate for asthma and other health effects based on indicators such as gender, race, age, ethnicity, etc. The BenMap user manual specifically states that there are a wide range of variables that can be included in the health effect function. The health effect function was developed based on epidemiological studies, and specifically states that “there are a number of issues that arise when deriving and choosing between health effect functions that go well beyond this user manual. Hence, it is important to have a trained health researcher assist in developing the impact function data file.”

overall (due to air quality and other causes). Because health is not solely influenced by ambient air quality, and has many factors that are highly variable across geographies and populations, there is an added level of uncertainty in using a generalized identification of health effects due to air quality conditions overlaid onto a specific diverse set of health conditions and other factors. Regardless of the uncertainty levels, if regional health effects are identified for a project, then the CEQA analysis needs to provide a full health baseline for decision-makers and the public to be able to understand the marginal change due to project criteria pollutant emissions. Given the margin of uncertainty at each step in the process (regional scale modeling, existing ambient air quality effects on health, population health conditions vulnerability, and marginal health effects of air pollution), the identification of marginal health effects due to individual projects using regional air quality modelling and tools such as BenMap are likely to be within the level of uncertainty and thus defined as “speculative” per CEQA.

The Role of Air Districts

Regional, community, multiscale air quality modeling conducted by the air districts for each individual air basin or locality within the air basin would be the most appropriate indicator of health effects for projects. The AQMPs provide a forecast of regional emissions based on regional dispersion modeling for all sources within the air basin. Regional-scale models attempt to account for all emissions sources within an air basin.

The regional scale model requires inputs such as existing and future regional sources of pollutants and global meteorological data, which are generally not accessible by CEQA practitioners. Modeling of future years should consider future concentrations of air pollutants based on regional growth projections and existing programs, rules, and regulations adopted by Federal, State, and local air districts. In general, air pollution in California is decreasing as a result of Federal and State laws. Based on the air quality management plans (AQMPs) required for air districts in a nonattainment area, air quality in the air basins are anticipated to improve despite an increase in population and employment growth. Air districts are charged with assessing programs, rules, and regulations so that the increase in population and employment does not conflict with the mandate to achieve the AAQS. Because emissions forecasting and health outcomes based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should also fall on the air districts to identify the potential health outcomes associated with individual project's criteria pollutant emissions.

The South Coast Air Quality Management District (South Coast AQMD) and the Sacramento Metropolitan Air Quality Management District (Sacramento Metropolitan AQMD) are exploring concepts for project-level analysis in light of Friant Ranch to assist local lead agencies.

- » South Coast AQMD is looking at the largest land use development project they have had in the air basin and doing a sensitivity analysis (using CAMx for photochemical grid modeling and BenMap for health outcomes) to see how locating a very large project in different parts of the air basin (Los Angeles, Inland Empire, v. Orange County) would affect the health incidence.
- » Sacramento Metropolitan AQMD is also looking at a screening process. Rather than looking at the upper end (i.e., largest project in the air basin), Sacramento Metropolitan AQMD is starting at the smallest project that exceeds the regional significance threshold and running CAMx and BenMap at different locations in the air basin to see how it affects regional health incidences.

Guidance from Air Districts would be the most effective way to incorporate meaningful information concerning regional health effects of project criteria pollutants in CEQA analyses, including guidance as to when modelling is and is not useful and meaningful, how modelling should be conducted, and how to best present additional information to inform decision-makers and the public about a project's impacts.

So...until air districts do their part, what should we do?

PROJECTS WITH CRITERIA POLLUTANT EMISSIONS BELOW AIR DISTRICT THRESHOLDS

The Friant Ranch ruling was about providing disclosure of health effects of project emissions that were well over the significance thresholds. Since the air district thresholds are tied to a level the air districts find to not have a significant effect on ambient air quality, there should be no need to discuss the health effects of criteria pollutant emissions that are less than the significance thresholds.

PROJECTS WITH CRITERIA POLLUTANT EMISSIONS ABOVE AIR DISTRICT THRESHOLDS

Pursuant to Section 15125 of the CEQA Guidelines, the environmental setting will normally constitute the baseline physical conditions by which a lead agency determines whether an impact is significant. For CEQA, the health effects associated with buildout of a project would occur at the project's horizon year. Because CEQA requires an analysis of the change from existing conditions, the change in effects would be associated with changes in ambient air quality and associated health outcomes between existing conditions and the project's horizon year. Therefore, in order to show how a project affects health outcomes in an air basin, the CEQA documents will need to qualitatively or quantitatively address: (1) existing ambient criteria pollutant concentrations, health incidences due to existing air quality, and health incidences overall; 2) future (without project) ambient criteria pollutant concentrations and health incidences, and 3) future (with project) ambient criteria pollutant concentrations and health incidences.

Projects with significant criteria pollutant emissions could use regional modelling and BenMap to identify health effects of project emissions, but it is likely that many (or most) projects that are not regionally substantial in scale will be shown to have minimal regional changes in PM and ozone concentrations and therefore minimal changes in associated health effects. In addition, many projects may have emissions that are less than the uncertainty level of regional air quality models and BenMap health effects modeling; in these cases, quantitative results will not be meaningful. Thus, absent better direction from air districts, CEQA lead agencies will have to determine on a case by case basis whether a qualitative discussion of health effects will suffice, or whether regional modeling, despite its limitations, should be conducted for the project.

Where a project has substantial criteria pollutant emissions when considered on a regional scale, and there is reason to believe that the modeling of ambient air quality and regional health effects would produce non-speculative results when considering modeling uncertainties, then CEQA lead agencies should use regional modelling.

Conclusion

The purpose of CEQA is to inform the public as to the potential for a project to result in one or more significant adverse effects on the environment (including health effects). A CEQA document must provide an understandable and clear environmental analysis and provide an adequate basis for decision making and public disclosure. Regional dispersion modeling of criteria pollutants and secondary pollutants like PM and ozone can provide additional information, but that information may be within the margin of modelling uncertainty and/or may not be meaningful for the public and decision-makers unless a full health context is presented in the CEQA document. Simply providing health outcomes based on use of a regional-scale model and BenMap may not satisfy the goal to provide decision-makers and the public with information that would assist in weighting the environmental consequences of a project. A CEQA document must provide an analysis that is understandable for decision making and public disclosure. Regional scale modeling may provide a technical method for this type of analysis, but it does not necessarily provide a meaningful way to connect the magnitude of a project's criteria pollutant emissions to health effects without speculation.

In order to accurately connect the dots, we urge California air districts to provide more guidance on how to identify and describe the health effects of exceeding regional criteria pollutant thresholds. The air districts are the primary agency responsible for ensuring that the air basins attain the AAQS and ensure the health and welfare of its residents relative to air quality. Because emissions forecasting and health outcomes are based on the regional growth projections to achieve the AAQS is under the purview of the air districts, it should fall on the air districts to identify the potential health outcomes associated with exceeding the CEQA thresholds for projects. The air districts should provide lead agencies with a consistent, reliable, and meaningful analytical approach to correlate specific health effects that may result from a project's criteria pollutant emissions.

Glossary

AAQS – Ambient Air Quality Standards

BenMap – Benefits Mapping and Analysis Program

CAMx – Comprehensive Air Quality Model with extensions

CMAQ – Community Multiscale Air Quality

NOx – Nitrogen Oxides

PM – Particulate Matter

SOx – Sulfur Oxides

State – California

USEPA – United States Environmental Protection Agency