
APPENDIX C

AQ,GHG, AND ENERGY MODELING



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Land Use Statistics - San Bernardino General Plan Update

	Existing Conditions	Current GP	DTSP	DTSP percentage of
	2025	2005	2050 Proposed GP (2050)	
Units	73,969	95,126	15,467	14%
Population	267,267	298,300	40,912	12%
Non-Residential SQFT	101,575,944	102,886,094	15,573,306	11%
Employment	111,690	144,913	21,839	13%
Service Population	378,957	443,213	62,751	12%

	Proposed GP 2050	Change from Existing Change	%	Change from the Current GP Change	%
Units	108,112	34,143	46%	12,986	14%
Population	330,892	63,625	24%	32,592	11%
Non-Residential SQFT	142,744,306	41,168,362	41%	39,858,212	39%
Employment	172,190	60,500	54%	27,277	19%
Service Population	503,082	124,125	33%	59,869	14%

AQMP Consistency Analysis

Change in Population and VMT in the City of San Bernardino (O-D Method)				
Category	Existing	Current General Plan	General Plan Update	DTSP
Population	267,267	298,300	330,892	40,912
Employment	111,690	144,913	172,190	21,839
SP	378,957	443,213	503,082	62,751
VMT per Day	7,892,116	8,358,721	9,487,287	2,072,594
VMT/SP	20.83	18.86	18.86	33.03

Note Origin-Destination (O-D) Methodology is not the same methodology for SB 743, which considers only commute-trip VMT. Modeling of vehicle miles traveled (VMT) provided by KOA is based on San Bernardino Transportation Analysis Model+ (SBTAM+). VMT from passenger vehicles and trucks that have an origin or destination in the City using a transportation origin-destination methodology. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375).

San Bernardino General Plan Update - Community GHG Emissions Inventory and Forecast

Category	MTCO ₂ e/year							
	Existing		General Plan Update		Increase from Existing		Current General Plan	
	TOTAL		TOTAL		TOTAL		TOTAL	
Building Electricity	199,684	12%	213,221	12%	13,537	7%	165,726	11%
Building Natural Gas	195,328	12%	280,648	16%	85,320	44%	227,710	15%
On-Road Transportation	1,071,954	64%	1,001,602	57%	-70,352	-7%	882,456	59%
Off-Road Vehicles and Equipment	22,199	1%	27,145	2%	4,946	22%	23,632	2%
Solid Waste/Landfills	42,593	3%	70,309	4%	27,717	65%	63,384	4%
Refrigerants	120,459	7%	149,136	9%	28,676	24%	134,446	9%
Water Use	12,219	1%	2,449	0%	-9,770	-80%	2,157	0%
Wastewater Treatment	2,798	0%	1,195	0%	-1,603	-57%	1,053	0%
Total Community Emissions	1,667,234	100%	1,745,705	100%	78,471	5%	1,500,564	100%
Service Population (SP)	378,957	NA	503,082	NA	124,125	33%	443,213	NA
MTCO ₂ e/SP	4.4	NA	3.5	NA	-0.9	-21%	3.4	NA
Trajectory to AB 1279	250,085	-85%	Does not Achieve Target					
DTSP MTCO₂e (Estimate)		217,747						

Notes: Emissions may not total to 100 percent due to rounding. Based on GWPs in the IPCC Fifth Assessment Report (AR5).

The emissions inventory and forecast is based on activity data for the City of San Bernardino. This emissions inventory methodology identifies GHG emissions produced within a jurisdiction and captures direct and indirect emissions generated by land uses in a community. The activity data methodology allows a direct comparison between a community's GHG emissions and that identified by CARB in the AB 32 and SB 32 inventory and forecast prepared for the scoping plan. Unlike a "consumption-based" GHG emissions inventory, an activity-based emissions inventory does not capture lifecycle emissions associated with consumptions of goods. While a consumption-based emissions inventory approach may document GHG emissions associated with the final demand (regardless of where they were generated), a consumption-based emissions inventory excludes emissions associated with products produced within the jurisdiction but consumed elsewhere. For these reasons, an activity-based emissions inventory was determined to be most applicable for determining significant impacts under CEQA.

Excludes GHG emissions natural gas use from Permitted Sources within the City.

San Bernardino Community Criteria Air Pollutant Emissions Inventory and Forecast

Sources

¹ Source: KOA 2025; EMFAC2021 Version 1.0.2 Emissions Rates. San Bernardino (SC) Sub-Area.

² Sources: SoCalGas 2025 and CalEEMod User's Guide for natural gas criteria air pollutant emission rates. Excludes criteria air pollutant emissions natural gas use from Permitted Sources within the City.

³ Source: Off-Road Web Query Version 1.1.2. Emissions Inventory.

⁴ Source: CalEEMod 2022 User's Guide

Existing (2025)

Phase	Existing (2025) Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Transportation ¹	271	2,959	14,785	65	466	177
Energy ²	54	953	585	6	75	75
Offroad Equipment ³	738	551	19,727	1	17	13
Consumer Products ⁴	2,697	0	0	0	0	0
Total	3,760	4,462	35,097	72	559	264

Existing in 2050

Phase	Existing Land Uses (2050) Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Transportation ¹	96	1,575	8,089	50	485	174
Energy ²	54	953	585	6	75	75
Offroad Equipment ³	738	551	19,727	1	17	13
Consumer Products ⁴	2,697	0	0	0	0	0
Total	3,585	3,078	28,401	58	578	261

General Plan Update (2050)

Phase	Project Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Transportation ¹	116	1,893	9,724	60	583	209
Energy ²	78	1,368	835	8	108	108
Offroad Equipment ³	340	622	15,168	1	14	8
Consumer Products ⁴	4,352	0	0	0	0	0
Total	4,885	3,884	25,727	70	705	324
DTSP Criteria Air Pollutant Emissions (Estimate)	609	484	3,209	9	88	40

NET CHANGE from Existing Land Uses (2050)

Phase	Net Change Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Transportation ¹	19	318	1,635	10	98	35
Energy ²	24	415	250	3	33	33
Offroad Equipment ³	-398	72	-4,558	0	-3	-5
Consumer Products ⁴	1,655	0	0	0	0	0
Total	1,300	805	-2,674	13	127	63
SCAQMD Threshold	55	55	550	150	150	55

San Bernardino Community Criteria Air Pollutant Emissions Inventory and Forecast

Exceeds Threshold	Yes	Yes	No	No	No	Yes
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NET CHANGE from Existing Conditions (2025) - Friant Ranch

Phase	Net Change (2050-2025) Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Transportation ¹	-156	-1,066	-5,062	-4	117	32
Energy ²	24	415	250	3	33	33
Offroad Equipment ³	-398	72	-4,558	0	-3	-5
Consumer Products ⁴	1,655	0	0	0	0	0
Total	1,125	-579	-9,370	-2	146	60
SCAQMD Threshold	55	55	550	150	150	55
Exceeds Threshold	Yes	No	No	No	No	Yes

Current General Plan

Phase	Project Criteria Air Pollutant Emissions (pounds/day)					
	VOC	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Transportation ¹	102	1,668	8,567	53	514	184
Energy ²	63	1,107	653	7	87	87
Offroad Equipment ³	293	534	12,814	1	12	7
Consumer Products ⁴	3,722	0	0	0	0	0
Total	4,180	3,309	22,034	61	614	278

Energy Data Requests to SCE and SoCalGas

Southern California Edison (SCE). 2025, May 20. Energy Report for City of San Bernardino. Request ID SCE1413215223 (2022 through 2024)					
	Annual Kwh			Interpolated ³	Average
Category ¹	2022	2023	2024	2025	(2022-2025)
Non-Residential ²	853,497,549	796,914,604	830,356,250	803,781,502	821,137,476
Residential	466,407,342	414,964,924	440,964,216	415,335,701	434,418,046
Total kwh	1,319,904,891	1,211,879,528	1,271,320,466	1,219,117,203	1,255,555,522

Notes:

¹ Non-Residential category includes commercial, industrial and agricultural land uses. May include permitted sources if there are major industries within the City.

² Interpolated Year 2025 usage based on years 2022-2024.

SoCalGas. 2025, June 10. Natural Gas Use in City of San Bernardino. Request ID 824 (2020 through 2024).							
	Annual Therms ¹					Interpolated ²	Average
Category	2020	2021	2022	2023	2024	2025	(2022-2025)
Commercial	14,218,935	14,569,944	15,110,186	15,856,369	14,521,878	15,423,156	15,227,897
Industrial	640,593	694,493	988,687	860,907	871,939	1,000,056	930,397
Single-Family Residential	16,056,126	15,303,479	14,902,238	16,095,108	14,778,232	14,897,789	15,168,342
Multi-Family Residential	5,681,535	5,454,215	5,334,132	5,617,486	5,278,536	5,280,363	5,377,629
Total Therms	36,597,189	36,022,131	36,335,243	38,429,870	35,450,585	36,601,363	36,704,265

Notes:

¹ May exclude natural gas use from Industrial (Permitted) Sources within the City.

² Interpolated Year 2025 usage based on years 2020-2024.

San Bernardino - Energy

SCE and SoCalGas Emission Factors

	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).

Southern California Edison				
Intensity factor				CO ₂ e
	CO ₂ lbs/MWH	CH ₄ lbs/MWH	N ₂ O lbs/MWH	lbs/MWh
2025	348.637	0.033	0.004	350.6
2050	260.788	0.033	0.004	262.8
	CO ₂ MTons/MWH	CH ₄ MTons/MWH	N ₂ O MTons/MWH	MTons/MWh
2025	0.158	1.50E-05	1.81E-06	0.159
2050	0.118	1.50E-05	1.81E-06	0.119

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-3, Electricity Utility Greenhouse Gas Emissions Factors

Notes

In 2018, SB 100 (de León, 2018) was signed into law, which again increases the RPS to 60% by 2030 and encourages the state's electricity to come from carbon-free resources by 2050.

GHG Emissions from Energy Use

	SCE	SoCalGas
Actual Energy Use	MWH/YR	Therms
Commercial	NA	15,227,897
Industrial	NA	930,397
Residential	434,418	20,545,971
Non-Residential	821,137	NA
City Total	1,255,556	36,704,265

Notes

Based on averaged data for existing energy and natural gas usage (2022-2025)

Forecast Methodology	Existing	General Plan Update	Current General Plan	DTSP
Residential - Dwelling Units	73,969	108,112	95,126	15,467
Nonresidential - Square footage	101,575,944	142,744,306	102,886,094	15,573,306

MWH per Unit per year 5.9	Therms per Unit per year 278
MWH per SQFT per year 0.01	Therms per SQFT per year 0.2

	Existing	General Plan Update	Current General Plan	DTSP
Electricity	MWH			
Residential	434,418	634,939	558,673	90,837
Nonresidential	821,137	1,153,942	831,729	125,894
Total	1,255,556	1,788,881	1,390,401	216,732
Electricity	MTCO ₂ e			
Residential	69,090	75,680	66,590	10,827
Nonresidential	130,594	137,541	99,136	15,006
Total Electricity	199,684	213,221	165,726	25,833

	Existing	General Plan Update	Current General Plan	DTSP
Natural Gas	Therms			
Residential	20,545,971	30,029,688	26,422,637	4,296,185
Nonresidential	16,158,294	22,707,192	16,366,708	2,477,339
Total	36,704,265	52,736,881	42,789,345	6,773,524
Natural Gas	MTCO ₂ e			
Residential	109,339	159,808	140,612	22,863
Nonresidential	85,989	120,840	87,098	13,184
Total Natural Gas	195,328	280,648	227,710	36,046

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Criteria Air Pollutants from Natural Gas

Rate	lbs/MBTU					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Natural Gas						
Residential	0.0054	0.0922	0.0392	0.0006	0.0075	0.0075
Non-Residential	0.0054	0.0980	0.0824	0.0006	0.0075	0.0075

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).

San Bernardino	Existing	General Plan Update	Current General Plan
Therms			
Residential	20,545,971	30,029,688	26,422,637
Nonresidential	16,158,294	22,707,192	16,366,708
Total	36,704,265	52,736,881	42,789,345

Natural Gas	Existing lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	30	519	221	3	42	42
Nonresidential	24	434	365	3	33	33
TOTAL	54	953	585	6	75	75

Natural Gas	Current General Plan lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	39	667	284	4	54	54
Nonresidential	24	440	369	3	33	33
TOTAL	63	1107	653	7	87	87

Natural Gas	General Plan Update lbs/day					
	ROG	NO _x	CO	SO ₂	PM ₁₀	PM _{2.5}
Residential	44	758	323	5	61	61
Nonresidential	34	610	512	4	46	46
TOTAL	78	1368	835	8	108	108

Area Sources - Consumer Products

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%	2,448	5
2010 to 2019	2.50%	2,524	63
2000 to 2009	7.40%	2,404	178
1990 to 1999	10.60%	2,116	224
1980 to 1989	18.40%	1,819	335
1979 or earlier	61.00%	1,699	1,037
Total	100%		1,841

Sources/Notes:

a. United States Census Bureau, Selected Housing Characteristics, City of San Bernardino, 2023. Table DP04. American Community Survey 5-Year Estimates, Year structure built.

<https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/2023/>

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/completed.html>

	Existing	General Plan Update	Current General Plan
Housing Units	73,969	108,112	95,126
Residential SQFT	136,212,611	219,777,603	187,994,368
lbs VOC per day	2,697	4,352	3,722

Area Sources

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

OFFROAD Estimate based on:

Agricultural Equipment Based on the percentage of agricultural acreage within the City compared to the County of San Bernardino (San Bernardino County, 2023 Crop Report)
Source: 2023 San Bernardino County Crop Report. <https://awm.sbcounty.gov/wp-content/uploads/sites/84/2024/09/2023-AWM-CROP-REPORT-FINAL-090324.pdf>.

Construction Equipment Based on the percentage of housing permits in City compared to the San Bernardino County (HUD 2020-2024)
Source: Housing and Urban Development (HUD). SOCDS Building Permits Database. <https://socds.huduser.gov/permits/>.

Light Commercial and Industrial Equipment Based on the percentage of employment in City compared to San Bernardino County (US Census 2024, Quarter 2)
Source: U.S. Census Bureau. LED Extraction Tool, <http://lehd.ces.census.gov/>.

Lawn & Garden Based on the percentage of housing units in City compared to San Bernardino County (US Census 2023)
Source: U.S. Census Bureau. American Community Survey, Data Profiles, <https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/>.

Farmland Acreage

		Change from Existing Condiitons
Existing Farmland acreage	46	NA
General Plan Update Farmland Acreage	46	0%
Current General Plan Farmland acreage	46	0%

Source: California Department of Conservation (DOC), Historic Land Use Conversion,<https://www.conservation.ca.gov/dlrp/fmmp/Pages/SanBernardino.aspx>. Refer to Table 3.2-2, Important Farmland Acreage in the General Plan Update, of this DEIR.

Existing		ROG Exhaust lbs/day	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM ₁₀ Exhaust	PM _{2.5} Exhaust	CO ₂ MT/yr
Agricultural		0	0	0	0	0	0	1
Construction Equipment		15	108	250	0	6	5	4,896
Lawn & Garden		409	53	4,544	0	4	3	2,529
Light Commercial / Industrial Equipment		314	390	14,933	1	7	4	14,774
TOTAL		738	551	19,727	1	17	13	22,199

General Plan Update		ROG Exhaust lbs/day	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM ₁₀ Exhaust	PM _{2.5} Exhaust	CO ₂ MT/yr
	Forecast Adjusted for:							
Construction Equipment	Similar to historic	12	64	250	0	4	3	4,867
Lawn & Garden	Proportional to housing growth	129	13	241	0	1	1	409
Light Commercial / Industrial Equipment	Proportional to employment growth	199	545	14,677	1	9	4	21,869
TOTAL		340	622	15,168	1	14	8	27,145

Current General Plan		ROG Exhaust lbs/day	NO _x Exhaust	CO Exhaust	SO ₂ Exhaust	PM ₁₀ Exhaust	PM _{2.5} Exhaust	CO ₂ MT/yr
	Forecast Adjusted for:							
Construction Equipment	Similar to historic	12	64	250	0	4	3	4,867
Lawn & Garden	Proportional to housing growth	113	11	212	0	1	1	360
Light Commercial / Industrial Equipment	Proportional to employment growth	168	459	12,352	1	8	3	18,404
TOTAL		293	534	12,814	1	12	7	23,632

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2025

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 Bernardino	2025	Agricultural - Agricultural Tractors	Aggregate	Aggregate	Gasoline	93.89	0.00	0.00	0.00	0.00	0.00	0.00	0.002897	9.59E-01
San Bernardino	2025	Agricultural - Agricultural Tractors	Aggregate	Aggregate	Diesel	1855605.10	0.06	0.34	0.32	0.00	0.02	0.02	57.04855	1.89E+04
San Bernardino	2025	Agricultural - ATVs	Aggregate	Aggregate	Gasoline	52603.94	0.01	0.01	0.13	0.00	0.00	0.00	1.623129	5.37E+02
San Bernardino	2025	Agricultural - ATVs	Aggregate	Aggregate	Diesel	25008.04	0.00	0.00	0.01	0.00	0.00	0.00	0.768845	2.55E+02
San Bernardino	2025	Agricultural - ATVs	Aggregate	Aggregate	Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00E+00
San Bernardino	2025	Agricultural - Bale Wagons (Self Propelled)	Aggregate	Aggregate	Diesel	2284.86	0.00	0.00	0.00	0.00	0.00	0.00	0.070246	2.33E+01
San Bernardino	2025	Agricultural - Balers (Self Propelled)	Aggregate	Aggregate	Diesel	56.72	0.00	0.00	0.00	0.00	0.00	0.00	0.001744	5.77E-01
San Bernardino	2025	Agricultural - Combine Harvesters	Aggregate	Aggregate	Diesel	54760.94	0.00	0.01	0.01	0.00	0.00	0.00	1.683565	5.57E+02
San Bernardino	2025	Agricultural - Construction Equipment	Aggregate	Aggregate	Diesel	30326.37	0.00	0.01	0.01	0.00	0.00	0.00	0.932351	3.09E+02
San Bernardino	2025	Agricultural - Cotton Pickers	Aggregate	Aggregate	Diesel	526.57	0.00	0.00	0.00	0.00	0.00	0.00	0.016189	5.36E+00
San Bernardino	2025	Agricultural - Forage & Silage Harvesters	Aggregate	Aggregate	Diesel	42400.35	0.00	0.01	0.01	0.00	0.00	0.00	1.303552	4.32E+02
San Bernardino	2025	Agricultural - Forklifts	Aggregate	Aggregate	Diesel	28042.37	0.00	0.01	0.01	0.00	0.00	0.00	0.862132	2.85E+02
San Bernardino	2025	Agricultural - Hay Squeeze/Stack retriever	Aggregate	Aggregate	Diesel	9302.61	0.00	0.00	0.00	0.00	0.00	0.00	0.285999	9.47E+01
San Bernardino	2025	Agricultural - Misc - 2-Wheel Tractors	Aggregate	Aggregate	Gasoline	2521.00	0.00	0.00	0.04	0.00	0.00	0.00	1.61E-05	5.33E-03
San Bernardino	2025	Agricultural - Misc - Hydro Power Units	Aggregate	Aggregate	Gasoline	1790.40	0.00	0.00	0.03	0.00	0.00	0.00	1.12E-05	3.72E-03
San Bernardino	2025	Agricultural - Misc - Hydro Power Units	Aggregate	Aggregate	Diesel	7.45	0.00	0.00	0.00	0.00	0.00	0.00	3.41E-06	1.13E-03
San Bernardino	2025	Agricultural - Misc - Mowers	Aggregate	Aggregate	Gasoline	2195.20	0.00	0.00	0.03	0.00	0.00	0.00	1.36E-05	4.50E-03
San Bernardino	2025	Agricultural - Misc - Other	Aggregate	Aggregate	Gasoline	128.12	0.00	0.00	0.00	0.00	0.00	0.00	8.01E-07	2.65E-04
San Bernardino	2025	Agricultural - Misc - Other	Aggregate	Aggregate	Diesel	8.14	0.00	0.00	0.00	0.00	0.00	0.00	3.72E-06	1.23E-03
San Bernardino	2025	Agricultural - Misc - Sprayers	Aggregate	Aggregate	Gasoline	4075.60	0.00	0.00	0.06	0.00	0.00	0.00	2.46E-05	8.15E-03
San Bernardino	2025	Agricultural - Misc - Sprayers	Aggregate	Aggregate	Diesel	2.53	0.00	0.00	0.00	0.00	0.00	0.00	1.2E-06	3.97E-04
San Bernardino	2025	Agricultural - Misc - Tillers	Aggregate	Aggregate	Gasoline	42700.00	0.01	0.01	0.69	0.00	0.00	0.00	0.000272	9.00E-02
San Bernardino	2025	Agricultural - Misc - Tillers	Aggregate	Aggregate	Diesel	0.11	0.00	0.00	0.00	0.00	0.00	0.00	4.17E-08	1.38E-05
San Bernardino	2025	Agricultural - Nut Harvester	Aggregate	Aggregate	Diesel	47256.42	0.00	0.01	0.01	0.00	0.00	0.00	1.452847	4.81E+02
San Bernardino	2025	Agricultural - Other Harvesters	Aggregate	Aggregate	Diesel	34006.59	0.00	0.01	0.00	0.00	0.00	0.00	1.045495	3.46E+02
San Bernardino	2025	Agricultural - Sprayers/Spray rigs	Aggregate	Aggregate	Diesel	75173.22	0.00	0.02	0.01	0.00	0.00	0.00	2.311119	7.65E+02
San Bernardino	2025	Agricultural - Swathers/Windrowers/Hay Conditioners	Aggregate	Aggregate	Diesel	25846.28	0.00	0.00	0.00	0.00	0.00	0.00	0.794616	2.63E+02
TOTAL AGRICULTURAL OFFROAD						2336722.82	0.10	0.43	1.37	0.00	0.03	0.02	70.20	2.32E+04
ESTIMATED San Bernardino (g/yr; tpd; MTY)						78.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1
ESTIMATED San Bernardino (lbs/day)						157575.0	0	0	0.092	0.0	0.0	0	5	

AGRICULTURAL ACREAGE: https://awm.sbcounty.gov/wp-content/uploads/sites/84/2024/09/2023-AWM-CROP-REPORT-FINAL-090324.pdf			Existing
Farmland Acreage in San Bernardino County			1,364,293
Farmland Acreage in San Bernardino			46
Percent in the City			0.00%

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 Bernardino	2025	Construction and Mining - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	413006.0758	0.004228	0.046322	0.021127	1.23E-04	0.001979	0.00182	13.03519	4.32E+03
San Bernardino	2025	Construction and Mining - Bucket	Aggregate	Aggregate	Diesel	9736.364658	6.9E-05	0.000814	0.000314	2.91E-06	3.38E-05	3.11E-05	0.307297	1.02E+02
San Bernardino	2025	Construction and Mining - Compactor	Aggregate	Aggregate	Diesel	15838.19188	9.31E-05	0.001272	0.00053	4.74E-06	3.58E-05	3.29E-05	0.499881	1.66E+02
San Bernardino	2025	Construction and Mining - Concrete Mixer	Aggregate	Aggregate	Diesel	1462.790359	8.75E-06	0.000131	2.85E-05	4.37E-07	2.98E-06	2.74E-06	0.046168	1.53E+01
San Bernardino	2025	Construction and Mining - Concrete Pump	Aggregate	Aggregate	Diesel	14797.22793	0.000101	0.001141	0.000507	4.42E-06	4.16E-05	3.83E-05	0.467026	1.55E+02
San Bernardino	2025	Construction and Mining - Crane less than 35ton	Aggregate	Aggregate	Diesel	7181.999117	6.65E-05	0.001014	0.00055	2.15E-06	3.94E-05	3.62E-05	0.226676	7.51E+01
San Bernardino	2025	Construction and Mining - Cranes	Aggregate	Aggregate	Diesel	358215.7559	0.002732	0.036547	0.016645	1.07E-04	1.57E-03	1.44E-03	11.30591	3.74E+03
San Bernardino	2025	Construction and Mining - Crawler Tractors	Aggregate	Aggregate	Diesel	1062739.879	1.00E-02	0.110226	0.053089	3.18E-04	5.15E-03	4.74E-03	3.35E+01	1.11E+04
San Bernardino	2025	Construction and Mining - Crushing/Processing Equipment	Aggregate	Aggregate	Diesel	56990.67828	0.000219	0.00332	0.000865	1.70E-05	8.26E-05	7.6E-05	1.80E+00	5.96E+02
San Bernardino	2025	Construction and Mining - Excavators	Aggregate	Aggregate	Diesel	3367135.542	2.66E-02	0.329133	0.12108	1.01E-03	1.08E-02	9.95E-03	1.06E+02	3.52E+04
San Bernardino	2025	Construction and Mining - Graders	Aggregate	Aggregate	Diesel	483134.9913	0.004559	0.050668	0.019559	1.44E-04	0.002357	0.002168	15.24858	5.05E+03
San Bernardino	2025	Construction and Mining - Hopper Tractor Trailer	Aggregate	Aggregate	Diesel	963.8598215	3.46E-06	3.51E-05	1.13E-05	2.88E-07	1.31E-06	1.21E-06	0.030421	1.01E+01
San Bernardino	2025	Construction and Mining - Misc - Asphalt Pavers	Aggregate	Aggregate	Gasoline	9238.65	1.52E-03	0.00125	0.057645	2.33E-06	5.63E-04	4.26E-04	0.149505	4.95E+01
San Bernardino	2025	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Gasoline	5979.87	4.11E-04	4.97E-04	0.015642	1.49E-06	1.58E-04	1.19E-04	1.32E-01	4.38E+01
San Bernardino	2025	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	38.82	0.000125	0.000789	0.000459	1.13E-08	2.67E-05	2.02E-05	1.83E-06	6.07E-04
San Bernardino	2025	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Gasoline	35534.8	1.90E-02	1.23E-02	0.564504	9.23E-06	5.42E-03	4.10E-03	2.26E-05	7.47E-03

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2025

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	2025	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Diesel	56.87	1.53E-04	0.000961	0.000746	1.66E-08	3.37E-05	2.54E-05	2.29E-06	7.59E-04
San Bernardino	2025	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Gasoline	45016.1	1.56E-02	0.011338	0.506067	1.16E-05	6.15E-03	4.66E-03	0.353023	1.17E+02
San Bernardino	2025	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Diesel	2218.27	7.23E-05	0.000555	0.000575	8.60E-07	1.62E-05	1.41E-05	6.80E-02	2.25E+01
San Bernardino	2025	Construction and Mining - Misc - Cranes	Aggregate	Aggregate	Gasoline	4927.5	1.28E-04	3.19E-04	0.007684	1.19E-06	8.19E-06	6.19E-06	1.18E-01	3.89E+01
San Bernardino	2025	Construction and Mining - Misc - Crushing/Proc. Equipment	Aggregate	Aggregate	Gasoline	225.48	0.000106	7.36E-05	0.003614	5.74E-08	4.61E-05	3.48E-05	1.42E-07	4.71E-05
San Bernardino	2025	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Gasoline	3678.4	2.02E-03	0.001378	5.36E-02	9.47E-07	6.02E-04	4.55E-04	7.65E-03	2.53E+00
San Bernardino	2025	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Diesel	4.586	1.54E-05	9.75E-05	5.27E-05	1.33E-09	3.28E-06	2.48E-06	2.26E-07	7.47E-05
San Bernardino	2025	Construction and Mining - Misc - Excavators	Aggregate	Aggregate	Diesel	32.79	1.10E-04	0.000697	0.000376	9.55E-09	2.34E-05	1.76E-05	1.60E-06	5.31E-04
San Bernardino	2025	Construction and Mining - Misc - Other	Aggregate	Aggregate	Gasoline	7515.35	6.59E-05	0.000242	0.00606	1.87E-06	1.35E-05	1.02E-05	0.188743	6.25E+01
San Bernardino	2025	Construction and Mining - Misc - Other	Aggregate	Aggregate	Diesel	121.94	0.000326	0.002041	0.001603	3.56E-08	7.13E-05	5.39E-05	4.90E-06	1.62E-03
San Bernardino	2025	Construction and Mining - Misc - Pavers	Aggregate	Aggregate	Diesel	8.61	2.9E-05	0.000183	9.89E-05	2.51E-09	6.15E-06	4.65E-06	4.23E-07	1.40E-04
San Bernardino	2025	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Gasoline	66520.2	0.033525	0.023079	0.975243	1.72E-05	1.07E-02	8.06E-03	0.134751	4.46E+01
San Bernardino	2025	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Diesel	14.66	4.92E-05	3.11E-04	1.68E-04	4.27E-09	1.05E-05	7.90E-06	7.18E-07	2.38E-04
San Bernardino	2025	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Gasoline	24265.8	0.013856	8.95E-03	0.38361	6.26E-06	3.61E-03	2.73E-03	1.54E-05	5.10E-03
San Bernardino	2025	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Diesel	40.93	0.000105	0.000656	0.00055	1.19E-08	2.31E-05	1.74E-05	1.58E-06	5.23E-04
San Bernardino	2025	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Gasoline	31393.6	0.007067	0.005752	0.24583	7.64E-06	0.002573	0.001946	0.424401	1.41E+02
San Bernardino	2025	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Diesel	250.7	0.000725	0.004562	0.003176	7.32E-08	0.000157	0.000119	1.08E-05	3.57E-03
San Bernardino	2025	Construction and Mining - Misc - Rough Terrain Forklifts	Aggregate	Aggregate	Gasoline	34777.2	0.000798	0.002264	0.041056	8.31E-06	5.94E-05	4.49E-05	8.51E-01	2.82E+02
San Bernardino	2025	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Gasoline	18417.9	0.00045	0.001165	0.026808	4.36E-06	3.08E-05	2.33E-05	4.43E-01	1.47E+02
San Bernardino	2025	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	5.95	2.01E-05	0.000127	6.84E-05	1.74E-09	4.26E-06	3.22E-06	2.92E-07	9.68E-05
San Bernardino	2025	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Gasoline	687.44	0.000333	0.000245	0.010983	1.76E-07	0.000139	0.000105	4.45E-07	1.47E-04
San Bernardino	2025	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Diesel	1614.55	0.001661	0.010444	0.008808	5.65E-07	0.000366	0.000277	3.00E-02	9.93E+00
San Bernardino	2025	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Gasoline	67938.55	0.01055	0.008163	0.350186	1.76E-05	0.003658	0.002763	1.22E+00	4.02E+02
San Bernardino	2025	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1689	0.00568	0.03589	0.01936	4.92E-07	0.001223	0.000924	8.28E-05	2.74E-02
San Bernardino	2025	Construction and Mining - Misc - Surfacing Equipment	Aggregate	Aggregate	Gasoline	29496.6	0.018014	0.012971	0.46287	7.55E-06	0.005616	0.004252	1.87E-05	6.19E-03
San Bernardino	2025	Construction and Mining - Misc - Tampers/Rammers	Aggregate	Aggregate	Gasoline	4078.8	0.001715	0.001324	0.065954	1.07E-06	0.000943	0.000712	2.90E-06	9.60E-04
San Bernardino	2025	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Gasoline	11833.3	0.000213	0.000607	0.016208	2.76E-06	1.99E-05	1.51E-05	2.86E-01	9.47E+01
San Bernardino	2025	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	156.6	0.000528	0.003329	0.0018	4.57E-08	0.000112	8.47E-05	7.69E-06	2.55E-03
San Bernardino	2025	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Gasoline	57488.2	0.012579	0.01008	0.448643	1.45E-05	0.004702	0.003547	7.79E-01	2.58E+02
San Bernardino	2025	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Diesel	210.6	0.000662	0.004183	0.002539	6.15E-08	0.000142	0.000107	9.74E-06	3.23E-03
San Bernardino	2025	Construction and Mining - Nurse Rig Other	Aggregate	Aggregate	Diesel	87.98834605	1.05E-06	1.54E-05	1.13E-05	2.63E-08	7.99E-07	7.35E-07	2.78E-03	9.20E-01
San Bernardino	2025	Construction and Mining - Off-Highway Tractors	Aggregate	Aggregate	Diesel	604142.1895	0.006001	0.061317	0.030259	1.81E-04	0.00257	0.002364	1.91E+01	6.31E+03
San Bernardino	2025	Construction and Mining - Off-Highway Trucks	Aggregate	Aggregate	Diesel	1444164.935	0.010205	0.130352	0.039801	4.32E-04	0.004432	0.004077	4.56E+01	1.51E+04
San Bernardino	2025	Construction and Mining - Other Construction Equipment	Aggregate	Aggregate	Diesel	689881.336	0.006101	0.074565	0.030663	2.06E-04	0.002859	0.00263	2.18E+01	7.21E+03
San Bernardino	2025	Construction and Mining - Other Material Handling Equipment	Aggregate	Aggregate	Diesel	213213.4317	0.00178	0.022002	0.008995	6.37E-05	0.00084	0.000773	6.73E+00	2.23E+03
San Bernardino	2025	Construction and Mining - Pavers	Aggregate	Aggregate	Diesel	216303.8351	0.00204	0.023384	0.010052	6.47E-05	0.000923	0.000849	6.83E+00	2.26E+03
San Bernardino	2025	Construction and Mining - Paving Equipment	Aggregate	Aggregate	Diesel	239344.7643	0.001686	0.020248	0.008681	7.16E-05	0.000736	0.000677	7.55E+00	2.50E+03
San Bernardino	2025	Construction and Mining - Rollers	Aggregate	Aggregate	Diesel	566892.1439	0.006864	0.076557	0.03663	1.69E-04	2.89E-03	2.66E-03	17.8921	5.92E+03
San Bernardino	2025	Construction and Mining - Rough Terrain Forklifts	Aggregate	Aggregate	Diesel	706372.5886	0.005068	0.075998	0.03705	2.11E-04	2.31E-03	2.12E-03	2.23E+01	7.38E+03
San Bernardino	2025	Construction and Mining - Rubber Tired Dozers	Aggregate	Aggregate	Diesel	131194.429	0.001399	0.014748	0.008978	3.92E-05	0.000761	0.0007	4.140725	1.37E+03
San Bernardino	2025	Construction and Mining - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	2463620.562	0.01907	0.210701	0.092105	7.37E-04	8.90E-03	8.18E-03	7.78E+01	2.57E+04
San Bernardino	2025	Construction and Mining - Scrapers	Aggregate	Aggregate	Diesel	1329537.311	0.01238	0.130831	0.082776	3.98E-04	0.00665	0.006118	41.96252	1.39E+04
San Bernardino	2025	Construction and Mining - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1158545.803	0.011926	0.208626	0.063954	0.000346	0.005062	0.004657	36.56573	1.21E+04
San Bernardino	2025	Construction and Mining - Spray Truck	Aggregate	Aggregate	Diesel	14118.63229	0.000136	0.001527	0.000777	4.22E-06	6.99E-05	6.43E-05	0.445609	1.48E+02
San Bernardino	2025	Construction and Mining - Spreader Tractor Trailer	Aggregate	Aggregate	Diesel	1778.260196	1.35E-05	0.000143	4.85E-05	5.32E-07	4.98E-06	4.58E-06	0.056125	1.86E+01
San Bernardino	2025	Construction and Mining - Spreader Truck	Aggregate	Aggregate	Diesel	11106.19581	8.18E-05	0.00083	0.000508	3.32E-06	3.95E-05	3.64E-05	0.350531	1.16E+02
San Bernardino	2025	Construction and Mining - Surfacing Equipment	Aggregate	Aggregate	Diesel	114310.6954	0.000794	0.009539	0.003687	3.42E-05	0.000377	0.000347	3.607845	1.19E+03
San Bernardino	2025	Construction and Mining - Tank Truck	Aggregate	Aggregate	Diesel	24297.39872	0.000167	0.00176	0.000571	7.26E-06	6.52E-05	6E-05	0.766868	2.54E+02
San Bernardino	2025	Construction and Mining - Tanker Truck Trailer	Aggregate	Aggregate	Diesel	1854.919058	1.2E-05	0.000127	4.47E-05	5.55E-07	3.54E-06	3.25E-06	0.058544	1.94E+01
San Bernardino	2025	Construction and Mining - Telescopic Handler	Aggregate	Aggregate	Diesel	48555.19154	0.000225	0.004949	0.001634	1.45E-05	9.56E-05	8.79E-05	1.532487	5.07E+02
San Bernardino	2025	Construction and Mining - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	3270528.955	0.033911	0.390746	0.19599	0.000978	0.016645	0.015313	103.2236	3.42E+04
San Bernardino	2025	Construction and Mining - Trenchers	Aggregate	Aggregate	Diesel	113787.6176	0.001833	0.020037	0.007961	3.40E-05	0.000772	0.00071	3.591336	1.19E+03
San Bernardino	2025	Construction and Mining - Vacuum Truck	Aggregate	Aggregate	Diesel	36764.20374	0.000342	0.003795	0.001875	1.10E-05	1.43E-04	1.32E-04	1.160342	3.84E+02
San Bernardino	2025	Construction and Mining - Water Truck	Aggregate	Aggregate	Diesel	109373.3814	0.000983	0.010321	0.004099	3.27E-05	0.000463	0.000426	3.452015	1.14E+03
TOTAL CONSTRUCTION OFFROAD						1.98E+07	3.20E-01	2.24E+00	5.18E+09	5.89E-03	1.27E-01	1.09E-01	6.14E+02	2.03E+05
ESTIMATED San Bernardino (g/yr; tpd; MTY)						475,714	7.70E-03	5.39E-02	1.25E-01	1.42E-04	3.05E-03	2.62E-03	1.48E+01	4,896
ESTIMATED San Bernardino (lbs/day)							15	108	250	0	6	5		

TOTAL HOUSING PERMITS: https://socds.huduser.gov/permits/						
	2020	2021	2022	2023	2024	Average
San Bernardino County	5,129	6,342	6,463	7,315	6,226	6,295
San Bernardino	29	207	167	203	47	152

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2025

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

Percent in the City	0.6%	3.3%	2.6%	2.8%	0.8%	2.4%
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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	2025	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Gasoline	325756.8434	0.36961	0.012367	1.079356	8.35E-05	0.004553	0.003441	5.761274	1.91E+03
San Bernardino	2025	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Gasoline	235099.308	0.40586	0.014434	0.709133	6.02E-05	0.002995	0.002263	3.78736	1.25E+03
San Bernardino	2025	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Gasoline	4344.658674	0.00064	0.000225	0.029186	1.13E-06	1.17E-06	8.83E-07	0.068364	2.26E+01
San Bernardino	2025	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Diesel	243.5798553	8.96E-06	5.66E-05	3.06E-05	7.11E-08	1.91E-06	1.44E-06	0.00743	2.46E+00
San Bernardino	2025	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Gasoline	793610.5194	0.101186	0.06218	4.749161	0.000215	0.000972	0.000735	13.46563	4.46E+03
San Bernardino	2025	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Gasoline	783074.2419	0.582576	0.020428	2.818808	0.0002	0.008384	0.006327	14.55334	4.82E+03
San Bernardino	2025	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Gasoline	19157.7209	0.002205	0.000907	0.124269	4.97E-06	6.16E-06	4.66E-06	0.31069	1.03E+02
San Bernardino	2025	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Diesel	123.4443586	3.98E-06	2.76E-05	2.2E-05	3.61E-08	9.63E-07	7.28E-07	0.003764	1.25E+00
San Bernardino	2025	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Gasoline	1408757.701	0.180721	0.09552	9.925594	0.00036	0.000707	0.000535	21.54884	7.14E+03
San Bernardino	2025	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Diesel	98086.98995	0.003464	0.022521	0.01397	2.86E-05	0.000767	0.00058	2.991047	9.90E+02
San Bernardino	2025	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Gasoline	1729.368098	0.000196	9.35E-05	0.013033	4.72E-07	5.06E-07	3.83E-07	0.025208	8.35E+00
San Bernardino	2025	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Gasoline	16717.06356	0.005594	0.000826	0.09524	4.49E-06	1.02E-05	7.71E-06	0.27921	9.25E+01
San Bernardino	2025	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Gasoline	574533.3311	0.367128	0.022197	2.113058	1.47E-04	0.003129	0.002364	10.81496	3.58E+03
San Bernardino	2025	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Lawn and Garden - Misc - Wood Splitters	Aggregate	Aggregate	Gasoline	160072.3709	0.021349	0.01062	1.012431	4.14E-05	9.47E-05	7.16E-05	2.627077	8.70E+02
TOTAL LAWN & GARDEN						4.42E+06	2.04E+00	2.62E-01	2.27E+01	1.15E-03	2.16E-02	1.63E-02	7.62E+01	2.52E+04
ESTIMATED San Bernardino						442,822		0	2	0	0	0	8	2,529
ESTIMATED San Bernardino (lbs/day)							409	53	4,544	0	4	3	15,273	

HOUSING UNITS https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/			Existing
Housing Units in San Bernardino County			738,535
Housing Units in San Bernardino			73,969
Percent in the City			10.0%

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 Bernardino	2025	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Gasoline	1553717.585	0.172134	0.105756	10.45053	0.000395	0.000619	0.000468	24.58232	8.14E+03
San Bernardino	2025	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Diesel	39626.84814	0.001153	0.007891	0.00961	1.49E-05	0.000243	0.000218	1.217371	4.03E+02
San Bernardino	2025	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Light Commercial - Misc - Gas Compressors	Aggregate	Aggregate	Nat Gas	486899.05	0	0.027768	0.325206	0	0	0	8.867348	2.94E+03
San Bernardino	2025	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Gasoline	2598673.455	0.528363	0.196644	15.88578	0.000674	0.001495	0.001129	42.78996	1.42E+04
San Bernardino	2025	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Diesel	200691.844	0.005462	0.041733	0.03518	6.81E-05	0.001345	0.001091	6.142826	2.03E+03
San Bernardino	2025	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Nat Gas	15654.85	0	0.000848	0.008118	0	0	0	0.289227	9.58E+01
San Bernardino	2025	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Gasoline	982381.4903	0.116378	0.052212	6.928501	0.000251	0.000253	0.000192	15.04914	4.98E+03
San Bernardino	2025	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Diesel	1026.877314	2.55E-05	0.000215	0.000179	3.51E-07	6.75E-06	5.39E-06	0.031415	1.04E+01
San Bernardino	2025	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Gasoline	332955.9776	0.033729	0.016646	1.593769	8.5E-05	0.000251	0.00019	6.263019	2.07E+03
San Bernardino	2025	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Diesel	110194.855	0.003155	0.022823	0.020384	3.77E-05	0.000746	0.000611	3.372849	1.12E+03
San Bernardino	2025	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Light Commercial - Misc - Welders	Aggregate	Aggregate	Gasoline	680608.8038	0.077511	0.0406	4.439058	0.000174	0.000442	0.000334	10.9542	3.63E+03
San Bernardino	2025	Light Commercial - Misc - Welders	Aggregate	Aggregate	Diesel	210268.8281	0.005956	0.042189	0.045805	7.7E-05	0.001331	0.001159	6.45204	2.14E+03
San Bernardino	2025	Light Commercial - Misc - Welders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2025	Industrial - Aerial Lifts	Aggregate	Aggregate	Diesel	96957.8579	0.000697	0.019174	0.004194	2.9E-05	0.000314	0.000289	3.060159	1.01E+03
San Bernardino	2025	Industrial - Boom	Aggregate	Aggregate	Diesel	96385.99892	0.000822	0.020616	0.002858	2.88E-05	0.000256	0.000235	3.04211	1.01E+03

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2025

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	2025	Industrial - Forklifts	Aggregate	Aggregate	Diesel	430036.3483	0.003105	0.055911	0.021569	0.000129	0.001597	0.001469	13.5727	4.49E+03
San Bernardino	2025	Industrial - Garbage Refuse	Aggregate	Aggregate	Diesel	4655.331927	2.5E-05	0.000325	9.21E-05	1.39E-06	8.19E-06	7.54E-06	0.14693	4.87E+01
San Bernardino	2025	Industrial - Garbage Transfer	Aggregate	Aggregate	Diesel	842.5710374	3.63E-06	3.46E-05	9.22E-06	2.52E-07	1.41E-06	1.3E-06	0.026593	8.81E+00
San Bernardino	2025	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Gasoline	58914.21	0.004851	0.004515	0.170568	1.51E-05	0.001383	0.001045	1.274645	4.22E+02
San Bernardino	2025	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Diesel	90.34	0.000274	0.001731	0.00111	2.64E-08	6.04E-05	4.57E-05	4.05E-06	1.34E-03
San Bernardino	2025	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Nat Gas	1173.625	7.54E-05	0.000588	0.021407	4.57E-08	5.76E-05	4.35E-05	1.89E-06	6.24E-04
San Bernardino	2025	Industrial - Misc - Forklifts	Aggregate	Aggregate	Gasoline	1855214.122	0.039634	0.185133	4.339469	0.000421	0.002932	0.002216	42.05167	1.39E+04
San Bernardino	2025	Industrial - Misc - Forklifts	Aggregate	Aggregate	Nat Gas	4242215.34	1.38E-05	0.335239	3.107594	4.95E-09	0.006835	5.11E-06	76.78279	2.54E+04
San Bernardino	2025	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Gasoline	27059.314	0.000978	0.002145	0.084101	6.85E-06	4.14E-05	3.13E-05	0.580112	1.92E+02
San Bernardino	2025	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	69.84	0.000212	0.001379	0.000859	2.04E-08	4.7E-05	3.55E-05	3.22E-06	1.07E-03
San Bernardino	2025	Industrial - Misc - Other Material Handling Equipment	Aggregate	Aggregate	Gasoline	13891.9	0.000242	0.001288	0.015121	3.33E-06	2.39E-05	1.81E-05	0.343397	1.14E+02
San Bernardino	2025	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Gasoline	101947.01	0.00203	0.007211	0.170788	2.61E-05	0.000169	0.000127	2.418878	8.01E+02
San Bernardino	2025	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	18.748	5.37E-05	0.000355	0.000238	5.47E-09	1.22E-05	9.2E-06	8.36E-07	2.77E-04
San Bernardino	2025	Industrial - Mower	Aggregate	Aggregate	Diesel	52344.66798	0.000823	0.011784	0.00375	1.57E-05	0.000298	0.000274	1.652089	5.47E+02
San Bernardino	2025	Industrial - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	130486.5408	0.001489	0.017706	0.00802	3.9E-05	0.000662	0.000609	4.118383	1.36E+03
San Bernardino	2025	Industrial - Other Truck	Aggregate	Aggregate	Diesel	77877.38866	0.000545	0.005944	0.001989	2.33E-05	0.000222	0.000204	2.457946	8.14E+02
San Bernardino	2025	Industrial - Railcars or Track Cars	Aggregate	Aggregate	Diesel	5997.50934	3.72E-05	0.00045	0.000167	1.79E-06	1.67E-05	1.54E-05	0.189292	6.27E+01
San Bernardino	2025	Industrial - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	25364.30449	0.000358	0.00475	0.001823	7.58E-06	0.000157	0.000145	0.800542	2.65E+02
San Bernardino	2025	Industrial - Tow Tractor	Aggregate	Aggregate	Diesel	171.9387943	1.12E-06	1.71E-05	3.46E-06	5.14E-08	4.85E-07	4.47E-07	0.005427	1.80E+00
San Bernardino	2025	Industrial - Yard Goat	Aggregate	Aggregate	Diesel	207403.1202	0.001472	0.015492	0.008951	6.2E-05	0.000593	0.000545	6.546004	2.17E+03
TOTAL LIGHT COMMERCIAL + INDUSTRIAL OFFROAD						1.46E+07	1.00E+00	1.25E+00	4.77E+01	2.59E-03	2.24E-02	1.28E-02	2.85E+02	9.44E+04
ESTIMATED San Bernardino						2.29E+06	1.57E-01	1.95E-01	7.47E+00	4.05E-04	3.51E-03	2.00E-03	4.46E+01	14,774
ESTIMATED San Bernardino (lbs/day)							314	390	14,933	1	7	4	89,236	

EMPLOYMENT: http://lehd.ces.census.gov/			Existing
Employment in San Bernardino County (2024 Q2)			713,629
Employment in San Bernardino			111,690
Percent in the City			15.65%

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2050

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 Bernardino	2050	Construction and Mining - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	412570.0079	0.001519	0.01843	0.003711	1.23E-04	0.00037	0.00034	13.02143	4.31E+03
San Bernardino	2050	Construction and Mining - Bucket	Aggregate	Aggregate	Diesel	9359.301662	3.27E-05	0.000493	8.26E-05	2.80E-06	7.89E-06	7.26E-06	0.295396	9.78E+01
San Bernardino	2050	Construction and Mining - Compactor	Aggregate	Aggregate	Diesel	15245.45054	4.95E-05	0.000794	0.000144	4.56E-06	1.29E-05	1.19E-05	0.481173	1.59E+02
San Bernardino	2050	Construction and Mining - Concrete Mixer	Aggregate	Aggregate	Diesel	1423.920116	4.93E-06	0.000105	1.39E-05	4.26E-07	1.28E-06	1.18E-06	0.044941	1.49E+01
San Bernardino	2050	Construction and Mining - Concrete Pump	Aggregate	Aggregate	Diesel	14420.72251	4.32E-05	0.000513	0.000119	4.31E-06	1.07E-05	9.89E-06	0.455143	1.51E+02
San Bernardino	2050	Construction and Mining - Crane less than 35ton	Aggregate	Aggregate	Diesel	7016.33653	1.81E-05	0.000433	7.99E-05	2.10E-06	6.07E-06	5.58E-06	0.221448	7.33E+01
San Bernardino	2050	Construction and Mining - Cranes	Aggregate	Aggregate	Diesel	359329.8066	0.000791	0.012495	0.00268	1.07E-04	2.67E-04	2.45E-04	11.34108	3.76E+03
San Bernardino	2050	Construction and Mining - Crawler Tractors	Aggregate	Aggregate	Diesel	1072670.072	3.33E-03	0.042794	0.008901	3.21E-04	8.89E-04	8.18E-04	3.39E+01	1.12E+04
San Bernardino	2050	Construction and Mining - Crushing/Processing Equipment	Aggregate	Aggregate	Diesel	54100.27402	0.000166	0.002484	0.00041	1.62E-05	4.29E-05	3.95E-05	1.71E+00	5.65E+02
San Bernardino	2050	Construction and Mining - Excavators	Aggregate	Aggregate	Diesel	3270966.017	1.21E-02	0.203079	0.030537	9.78E-04	2.91E-03	2.68E-03	1.03E+02	3.42E+04
San Bernardino	2050	Construction and Mining - Graders	Aggregate	Aggregate	Diesel	485589.1385	0.001378	0.016759	0.003801	1.45E-04	0.000374	0.000344	15.32604	5.07E+03
San Bernardino	2050	Construction and Mining - Hopper Tractor Trailer	Aggregate	Aggregate	Diesel	917.4068014	3.14E-06	3.01E-05	8.56E-06	2.74E-07	7.41E-07	6.82E-07	0.028955	9.59E+00
San Bernardino	2050	Construction and Mining - Misc - Asphalt Pavers	Aggregate	Aggregate	Gasoline	9685.75	1.72E-03	0.001342	0.064936	2.45E-06	6.55E-04	4.95E-04	0.149505	4.95E+01
San Bernardino	2050	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Gasoline	6044.33	4.29E-04	4.02E-04	0.016976	1.52E-06	1.77E-04	1.34E-04	1.32E-01	4.38E+01
San Bernardino	2050	Construction and Mining - Misc - Bore/Drill Rigs	Aggregate	Aggregate	Diesel	46.21	0.000149	0.000941	0.000547	1.35E-08	3.18E-05	2.4E-05	2.19E-06	7.24E-04
San Bernardino	2050	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Gasoline	42020.8	2.24E-02	1.47E-02	0.667895	1.09E-05	6.45E-03	4.88E-03	2.68E-05	8.87E-03
San Bernardino	2050	Construction and Mining - Misc - Cement And Mortar Mixers	Aggregate	Aggregate	Diesel	68.02	1.83E-04	0.001149	0.000892	1.99E-08	4E-05	3.02E-05	2.74E-06	9.08E-04
San Bernardino	2050	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Gasoline	50732.5	1.85E-02	0.013365	0.596701	1.31E-05	7.29E-03	5.52E-03	0.353027	1.17E+02
San Bernardino	2050	Construction and Mining - Misc - Concrete/Industrial Saws	Aggregate	Aggregate	Diesel	2642.37	6.7E-05	0.000578	0.000664	1.03E-06	7.14E-06	5.74E-06	8.10E-02	2.68E+01
San Bernardino	2050	Construction and Mining - Misc - Cranes	Aggregate	Aggregate	Gasoline	4920.2	9.39E-05	2.20E-04	0.007776	1.19E-06	8.19E-06	6.19E-06	1.18E-01	3.89E+01
San Bernardino	2050	Construction and Mining - Misc - Crushing/Proc. Equipment	Aggregate	Aggregate	Gasoline	259.14	0.000121	8.48E-05	0.004158	6.60E-08	5.3E-05	4E-05	1.64E-07	5.41E-05
San Bernardino	2050	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Gasoline	4325.75	2.41E-03	0.001648	6.34E-02	1.11E-06	7.14E-04	5.39E-04	7.65E-03	2.53E+00
San Bernardino	2050	Construction and Mining - Misc - Dumpers/Tenders	Aggregate	Aggregate	Diesel	5.5	1.85E-05	0.000117	6.31E-05	1.60E-09	3.93E-06	2.97E-06	2.70E-07	8.94E-05
San Bernardino	2050	Construction and Mining - Misc - Excavators	Aggregate	Aggregate	Diesel	39.22	1.32E-04	0.000834	0.00045	1.14E-08	2.80E-05	2.12E-05	1.92E-06	6.37E-04
San Bernardino	2050	Construction and Mining - Misc - Other	Aggregate	Aggregate	Gasoline	7508.05	6.59E-05	0.000242	0.00606	1.87E-06	1.35E-05	1.02E-05	0.188743	6.25E+01
San Bernardino	2050	Construction and Mining - Misc - Other	Aggregate	Aggregate	Diesel	147.85	0.000395	0.002479	0.001941	4.31E-08	8.64E-05	6.53E-05	5.93E-06	1.96E-03
San Bernardino	2050	Construction and Mining - Misc - Pavers	Aggregate	Aggregate	Diesel	10.41	3.5E-05	0.000222	0.00012	3.04E-09	7.45E-06	5.62E-06	5.11E-07	1.69E-04
San Bernardino	2050	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Gasoline	77936.9	0.039673	0.027378	1.156172	2.01E-05	1.27E-02	9.56E-03	0.134758	4.46E+01
San Bernardino	2050	Construction and Mining - Misc - Paving Equipment	Aggregate	Aggregate	Diesel	16.78	5.66E-05	3.58E-04	1.94E-04	4.91E-09	1.20E-05	9.10E-06	8.26E-07	2.74E-04
San Bernardino	2050	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Gasoline	28813.8	0.016486	1.06E-02	0.455566	7.44E-06	4.29E-03	3.23E-03	1.83E-05	6.05E-03
San Bernardino	2050	Construction and Mining - Misc - Plate Compactors	Aggregate	Aggregate	Diesel	48.95	0.000126	0.000784	0.000657	1.43E-08	2.76E-05	2.08E-05	1.9E-06	6.28E-04
San Bernardino	2050	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Gasoline	33930.45	0.008151	0.006269	0.286511	8.28E-06	0.003061	0.002313	0.424402	1.41E+02
San Bernardino	2050	Construction and Mining - Misc - Rollers	Aggregate	Aggregate	Diesel	294.5	0.000852	0.005353	0.003724	8.60E-08	0.000184	0.000139	1.27E-05	4.02E-03
San Bernardino	2050	Construction and Mining - Misc - Rough Terrain Forklifts	Aggregate	Aggregate	Gasoline	34718.8	0.000557	0.00152	0.040799	8.31E-06	5.94E-05	4.49E-05	8.51E-01	2.82E+02
San Bernardino	2050	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Gasoline	18377.75	0.000337	0.000875	0.026775	4.36E-06	3.08E-05	2.33E-05	4.43E-01	1.47E+02
San Bernardino	2050	Construction and Mining - Misc - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	6.97	2.34E-05	0.000148	0.00008	2.04E-09	4.98E-06	3.76E-06	3.42E-07	1.13E-04
San Bernardino	2050	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Gasoline	817.04	0.000396	0.000292	0.013049	2.09E-07	0.000165	0.000125	5.30E-07	1.76E-04
San Bernardino	2050	Construction and Mining - Misc - Signal Boards	Aggregate	Aggregate	Diesel	1933	0.001978	0.012448	0.010522	6.77E-07	0.000432	0.000327	3.59E-02	1.19E+01
San Bernardino	2050	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Gasoline	70632.75	0.01204	0.00913	0.392901	1.83E-05	0.0042	0.003164	1.22E+00	4.02E+02
San Bernardino	2050	Construction and Mining - Misc - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1948	0.006546	0.041348	0.02233	5.67E-07	0.001393	0.001051	9.55E-05	3.16E-02
San Bernardino	2050	Construction and Mining - Misc - Surfacing Equipment	Aggregate	Aggregate	Gasoline	34913	0.021431	0.015425	0.549981	8.97E-06	0.006675	0.005042	2.22E-05	7.36E-03
San Bernardino	2050	Construction and Mining - Misc - Tampers/Rammers	Aggregate	Aggregate	Gasoline	4858.8	0.002039	0.001577	0.078234	1.27E-06	0.00112	0.000846	3.45E-06	1.14E-03
San Bernardino	2050	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Gasoline	11829.65	0.000212	0.000603	0.016105	2.76E-06	1.99E-05	1.51E-05	2.86E-01	9.47E+01
San Bernardino	2050	Construction and Mining - Misc - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	188.6	0.000633	0.003997	0.002159	5.49E-08	0.000135	0.000102	9.24E-06	3.06E-03
San Bernardino	2050	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Gasoline	62295.95	0.014715	0.011136	0.525665	1.57E-05	0.005644	0.004269	7.79E-01	2.58E+02
San Bernardino	2050	Construction and Mining - Misc - Trenchers	Aggregate	Aggregate	Diesel	221.3	0.000697	0.004393	0.002668	6.46E-08	0.000149	0.000113	1.02E-05	3.39E-03
San Bernardino	2050	Construction and Mining - Nurse Rig Other	Aggregate	Aggregate	Diesel	88.89093012	2.65E-07	3.6E-06	1.02E-06	2.66E-08	8.32E-08	7.65E-08	2.81E-03	9.29E-01
San Bernardino	2050	Construction and Mining - Off-Highway Tractors	Aggregate	Aggregate	Diesel	595904.7661	0.002459	0.035843	0.006219	1.78E-04	0.000579	0.000532	1.88E+01	6.23E+03
San Bernardino	2050	Construction and Mining - Off-Highway Trucks	Aggregate	Aggregate	Diesel	1444784.638	0.005432	0.085769	0.011548	4.32E-04	0.001431	0.001317	4.56E+01	1.51E+04
San Bernardino	2050	Construction and Mining - Other Construction Equipment	Aggregate	Aggregate	Diesel	687536.0633	0.002341	0.040406	0.00641	2.06E-04	0.000632	0.000582	2.17E+01	7.19E+03
San Bernardino	2050	Construction and Mining - Other Material Handling Equipment	Aggregate	Aggregate	Diesel	208191.1035	0.000705	0.011521	0.001895	6.22E-05	0.000191	0.000176	6.57E+00	2.18E+03
San Bernardino	2050	Construction and Mining - Pavers	Aggregate	Aggregate	Diesel	210382.9988	0.000812	0.012812	0.00233	6.29E-05	0.000212	0.000195	6.64E+00	2.20E+03
San Bernardino	2050	Construction and Mining - Paving Equipment	Aggregate	Aggregate	Diesel	233406.0365	0.000762	0.011837	0.002164	6.98E-05	0.000203	0.000187	7.37E+00	2.44E+03
San Bernardino	2050	Construction and Mining - Rollers	Aggregate	Aggregate	Diesel	556711.7668	0.002241	0.048589	0.007051	1.66E-04	5.91E-04	5.44E-04	17.57079	5.82E+03
San Bernardino	2050	Construction and Mining - Rough Terrain Forklifts	Aggregate	Aggregate	Diesel	685276.424	0.002216	0.046023	0.008318	2.05E-04	6.06E-04	5.57E-04	2.16E+01	7.16E+03

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2050

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	2050	Construction and Mining - Rubber Tired Dozers	Aggregate	Aggregate	Diesel	146195.5598	0.000464	0.00531	0.001028	4.37E-05	0.000111	0.000102	4.614187	1.53E+03
San Bernardino	2050	Construction and Mining - Rubber Tired Loaders	Aggregate	Aggregate	Diesel	2445466.447	0.007854	0.091839	0.019885	7.31E-04	1.94E-03	1.78E-03	7.72E+01	2.56E+04
San Bernardino	2050	Construction and Mining - Scrapers	Aggregate	Aggregate	Diesel	1490615.629	0.003918	0.040951	0.00926	4.46E-04	0.000987	0.000908	47.04643	1.56E+04
San Bernardino	2050	Construction and Mining - Skid Steer Loaders	Aggregate	Aggregate	Diesel	1112986.925	0.005893	0.172278	0.016308	0.000333	0.001249	0.001149	35.12781	1.16E+04
San Bernardino	2050	Construction and Mining - Spray Truck	Aggregate	Aggregate	Diesel	13680.62885	5.51E-05	0.000887	0.000127	4.09E-06	1.29E-05	1.18E-05	0.431785	1.43E+02
San Bernardino	2050	Construction and Mining - Spreader Tractor Trailer	Aggregate	Aggregate	Diesel	1729.167256	5.17E-06	6.44E-05	1.13E-05	5.17E-07	1.17E-06	1.07E-06	0.054576	1.81E+01
San Bernardino	2050	Construction and Mining - Spreader Truck	Aggregate	Aggregate	Diesel	10774.21579	3.39E-05	0.000357	9.14E-05	3.22E-06	8.51E-06	7.83E-06	0.340053	1.13E+02
San Bernardino	2050	Construction and Mining - Surfacing Equipment	Aggregate	Aggregate	Diesel	113975.3129	0.000355	0.005294	0.0009	3.41E-05	9.85E-05	9.07E-05	3.59726	1.19E+03
San Bernardino	2050	Construction and Mining - Tank Truck	Aggregate	Aggregate	Diesel	23048.89612	7.81E-05	0.000739	0.000176	6.89E-06	1.87E-05	1.72E-05	0.727463	2.41E+02
San Bernardino	2050	Construction and Mining - Tanker Truck Trailer	Aggregate	Aggregate	Diesel	1754.73556	6.18E-06	9.98E-05	1.55E-05	5.25E-07	1.42E-06	1.31E-06	0.055383	1.83E+01
San Bernardino	2050	Construction and Mining - Telescopic Handler	Aggregate	Aggregate	Diesel	46380.72793	0.000146	0.003854	0.00053	1.39E-05	3.92E-05	3.6E-05	1.463857	4.85E+02
San Bernardino	2050	Construction and Mining - Tractors/Loaders/Backhoes	Aggregate	Aggregate	Diesel	3197679.956	0.011818	0.213535	0.036913	0.000956	0.003111	0.002862	100.9244	3.34E+04
San Bernardino	2050	Construction and Mining - Trenchers	Aggregate	Aggregate	Diesel	111279.8571	0.000597	0.01384	0.001571	3.33E-05	0.000158	0.000145	3.512186	1.16E+03
San Bernardino	2050	Construction and Mining - Vacuum Truck	Aggregate	Aggregate	Diesel	35812.32263	0.000128	0.001462	0.000374	1.07E-05	3.33E-05	3.07E-05	1.130299	3.74E+02
San Bernardino	2050	Construction and Mining - Water Truck	Aggregate	Aggregate	Diesel	109666.7555	0.000355	0.003912	0.000792	3.28E-05	8.58E-05	7.89E-05	3.461274	1.15E+03
TOTAL CONSTRUCTION OFFROAD						1.97E+07	2.42E-01	1.34E+00	5.20E+00	5.87E-03	7.30E-02	5.80E-02	6.11E+02	2.02E+05
ESTIMATED San Bernardino (g/yr; tpd; MTY)						474,095	5.82E-03	3.22E-02	1.25E-01	1.41E-04	1.76E-03	1.40E-03	1.47E+01	4,867
ESTIMATED San Bernardino (lbs/day)							12	64	250	0	4	3		

TOTAL HOUSING PERMITS: https://socds.huduser.gov/permits/						
	2020	2021	2022	2023	2024	Average
San Bernardino County	5,129	6,342	6,463	7,315	6,226	6,295
San Bernardino	29	207	167	203	47	152
Percent in the City	0.6%	3.3%	2.6%	2.8%	0.8%	2.4%

Note: Proportion of housing permits in the City assumed to remain the same as existing conditions.

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	2050	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Gasoline	100.7870098	0.000126	4.24E-06	0.000328	2.61E-08	1.39E-06	1.05E-06	0.001754	5.81E-01
San Bernardino	2050	Lawn and Garden - Misc - Chainsaws	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Gasoline	248376.0719	0.434452	0.015482	0.74486	6.36E-05	0.003166	0.002395	3.988079	1.32E+03
San Bernardino	2050	Lawn and Garden - Misc - Chainsaws Preempt	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Gasoline	4625.609314	0.000689	0.00024	0.031111	1.20E-06	1.16E-06	8.73E-07	0.072757	2.41E+01
San Bernardino	2050	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Diesel	299.8376224	1.1E-05	6.97E-05	3.77E-05	8.74E-08	2.35E-06	1.77E-06	0.00915	3.03E+00
San Bernardino	2050	Lawn and Garden - Misc - Chippers/Stump Grinders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Gasoline	416.0036869	6.06E-05	3.81E-05	0.002501	1.91E-07	1.55E-07	1.17E-07	0.007012	2.32E+00
San Bernardino	2050	Lawn and Garden - Misc - Lawn Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Gasoline	0.312976067	2.66E-07	8.48E-09	1.11E-06	8.07E-11	3.3E-09	2.49E-09	5.73E-06	1.90E-03
San Bernardino	2050	Lawn and Garden - Misc - Leaf Blowers/Vacuums	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Gasoline	32.24272463	4.25E-06	1.72E-06	0.000209	8.67E-09	7.83E-09	5.91E-09	0.000521	1.73E-01
San Bernardino	2050	Lawn and Garden - Misc - Other	Aggregate	Aggregate	Diesel	152.1206548	4.91E-06	3.4E-05	2.71E-05	4.44E-08	1.19E-06	8.97E-07	0.00463	1.53E+00
San Bernardino	2050	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Gasoline	26209.1538	0.00031	0.000162	0.016372	6.65E-06	5.03E-07	3.8E-07	0.676009	2.24E+02
San Bernardino	2050	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Diesel	119823.5547	0.004235	0.027532	0.017075	3.5E-05	0.000936	0.000707	3.654037	1.21E+03
San Bernardino	2050	Lawn and Garden - Misc - Rear Engine Riding Mowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Gasoline	0.038376447	4.21E-09	1.98E-09	2.9E-07	1.69E-11	9.21E-12	6.96E-12	5.57E-07	1.85E-04
San Bernardino	2050	Lawn and Garden - Misc - Snowblowers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Gasoline	1.06985266	4.4E-07	6.17E-08	6.05E-06	3.00E-10	5.99E-10	4.52E-10	1.77E-05	5.85E-03
San Bernardino	2050	Lawn and Garden - Misc - Tillers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Gasoline	0.020600889	1.37E-08	8.28E-10	7.55E-08	5.25E-12	1.12E-10	8.45E-11	3.87E-07	1.28E-04
San Bernardino	2050	Lawn and Garden - Misc - Trimmers/Edgers/Brush Cutters	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Lawn and Garden - Misc - Wood Splitters	Aggregate	Aggregate	Gasoline	1862.034953	0.000233	0.000116	0.011733	4.87E-07	4.78E-07	3.61E-07	0.030711	1.02E+01
TOTAL LAWN & GARDEN						4.02E+05	4.40E-01	4.37E-02	8.24E-01	1.07E-04	4.11E-03	3.11E-03	8.44E+00	2.80E+03
ESTIMATED San Bernardino						40,253	0	0	0	0	0	0	1	280
ESTIMATED San Bernardino (lbs/day)							88	9	165	0	1	1	1,692	

HOUSING UNITS https://www.census.gov/acs/www/data/data-tables-and-tools/data-profiles/			Existing
Housing Units in San Bernardino County			738,535
Housing Units in San Bernardino			73,969
Percent in the City			10.0%

Note: Proportion of housing units in the City assumed to remain the same as existing conditions.

San Bernardino County OFFROAD2021

Source: Off-Road Web Query (v.1.1.2) Emissions Inventory. <https://arb.ca.gov/emfac/offroad/emissions-inventory/8f3e1de4a634425da5031866f78d800f24440cb8>.

Model Output: Off-Road Web Query (v1.1.2) Emissions Inventory

Region Type: County

Region: San Bernardino

Calendar Year: 2050

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 Bernardino	2050	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Gasoline	1874558.938	0.20678	0.124437	12.66536	0.000477	0.000704	0.000532	29.57679	9.79E+03
San Bernardino	2050	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Diesel	45336.25323	0.00097	0.007808	0.010646	1.71E-05	6.9E-05	5.81E-05	1.392802	4.61E+02
San Bernardino	2050	Light Commercial - Misc - Air Compressors	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Light Commercial - Misc - Gas Compressors	Aggregate	Aggregate	Nat Gas	561658.35	0	0.032029	0.375116	0	0	0	10.22865	3.39E+03
San Bernardino	2050	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Gasoline	279253.7103	0.005303	0.016895	0.420226	7.57E-05	0.000463	0.00035	6.700133	2.22E+03
San Bernardino	2050	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Diesel	224353.0936	0.005185	0.042861	0.038459	7.64E-05	0.000945	0.000725	6.868476	2.27E+03
San Bernardino	2050	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Light Commercial - Misc - Generator Sets	Aggregate	Aggregate	Nat Gas	18031	0	0.000837	0.009361	0	0	0	0.333628	1.10E+02
San Bernardino	2050	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Gasoline	1839.705476	4.35E-05	7.7E-05	0.003447	5.25E-07	2.95E-06	2.23E-06	0.043064	1.43E+01
San Bernardino	2050	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Diesel	1142.370284	2.49E-05	0.000222	0.000196	3.94E-07	5.18E-06	3.96E-06	0.034925	1.16E+01
San Bernardino	2050	Light Commercial - Misc - Pressure Washers	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Gasoline	398504.8758	0.036232	0.019636	1.951453	0.000102	0.000287	0.000217	7.443635	2.46E+03
San Bernardino	2050	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Diesel	123409.199	0.002929	0.023356	0.022282	4.24E-05	0.000492	0.000379	3.778209	1.25E+03
San Bernardino	2050	Light Commercial - Misc - Pumps	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Light Commercial - Misc - Welders	Aggregate	Aggregate	Gasoline	809172.9542	0.090584	0.044	5.344595	0.000206	0.000402	0.000304	12.9261	4.28E+03
San Bernardino	2050	Light Commercial - Misc - Welders	Aggregate	Aggregate	Diesel	238869.5215	0.005106	0.04221	0.050495	8.78E-05	0.000545	0.000437	7.330624	2.43E+03
San Bernardino	2050	Light Commercial - Misc - Welders	Aggregate	Aggregate	Electric	0	0	0	0	0	0	0	0	0.00E+00
San Bernardino	2050	Industrial - Aerial Lifts	Aggregate	Aggregate	Diesel	94280.81761	0.000383	0.017038	0.001319	2.82E-05	9.43E-05	8.68E-05	2.975667	9.85E+02
San Bernardino	2050	Industrial - Boom	Aggregate	Aggregate	Diesel	93027.88665	0.000509	0.019256	0.001264	2.78E-05	9.73E-05	8.95E-05	2.936122	9.72E+02
San Bernardino	2050	Industrial - Forklifts	Aggregate	Aggregate	Diesel	420072.3614	0.001266	0.037607	0.004959	0.000126	0.000363	0.000334	13.25822	4.39E+03
San Bernardino	2050	Industrial - Garbage Refuse	Aggregate	Aggregate	Diesel	4500.79386	1.49E-05	0.000224	3.36E-05	1.35E-06	3.81E-06	3.51E-06	0.142053	4.70E+01
San Bernardino	2050	Industrial - Garbage Transfer	Aggregate	Aggregate	Diesel	809.3070983	2.4E-06	2.12E-05	4.89E-06	2.42E-07	5.42E-07	4.98E-07	0.025543	8.46E+00
San Bernardino	2050	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Gasoline	69354.73	0.005944	0.005457	0.205904	1.77E-05	0.001699	0.001284	1.491312	4.94E+02
San Bernardino	2050	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Diesel	111.24	0.000337	0.002124	0.001368	3.25E-08	7.26E-05	5.48E-05	4.98E-06	1.65E-03
San Bernardino	2050	Industrial - Misc - Aerial Lifts	Aggregate	Aggregate	Nat Gas	1598.495	0.000103	0.000798	0.029023	6.2E-08	7.82E-05	5.91E-05	2.55E-06	8.45E-04
San Bernardino	2050	Industrial - Misc - Forklifts	Aggregate	Aggregate	Gasoline	2170151.3	0.046324	0.216454	5.070384	0.000493	0.003431	0.002592	49.19969	1.63E+04
San Bernardino	2050	Industrial - Misc - Forklifts	Aggregate	Aggregate	Nat Gas	5404103.74	1.8E-05	0.426935	3.957914	6.46E-09	0.008708	6.67E-06	97.81408	3.24E+04
San Bernardino	2050	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Gasoline	29291.25	0.000604	0.002212	0.059205	7.41E-06	4.72E-05	3.56E-05	0.678709	2.25E+02
San Bernardino	2050	Industrial - Misc - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	88.84	0.00027	0.001754	0.001091	2.59E-08	5.97E-05	4.51E-05	4.1E-06	1.36E-03
San Bernardino	2050	Industrial - Misc - Other Material Handling Equipment	Aggregate	Aggregate	Gasoline	16235.2	0.00021	0.001325	0.01735	3.9E-06	2.8E-05	2.12E-05	0.401768	1.33E+02
San Bernardino	2050	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Gasoline	117230.7	0.001968	0.008211	0.166041	3E-05	0.000197	0.000148	2.830033	9.37E+02
San Bernardino	2050	Industrial - Misc - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	24.051	6.9E-05	0.000456	0.000305	7.02E-09	1.56E-05	1.18E-05	1.07E-06	3.55E-04
San Bernardino	2050	Industrial - Mower	Aggregate	Aggregate	Diesel	49739.99552	0.000372	0.010221	0.000846	1.49E-05	7.86E-05	7.23E-05	1.569881	5.20E+02
San Bernardino	2050	Industrial - Other General Industrial Equipment	Aggregate	Aggregate	Diesel	129935.7313	0.000534	0.011208	0.001486	3.88E-05	0.000142	0.000131	4.100998	1.36E+03
San Bernardino	2050	Industrial - Other Truck	Aggregate	Aggregate	Diesel	75298.15783	0.000299	0.003434	0.000706	2.25E-05	7.6E-05	6.99E-05	2.376541	7.87E+02
San Bernardino	2050	Industrial - Railcars or Track Cars	Aggregate	Aggregate	Diesel	5743.074799	1.91E-05	0.000253	4.97E-05	1.72E-06	4.95E-06	4.55E-06	0.181261	6.00E+01
San Bernardino	2050	Industrial - Sweepers/Scrubbers	Aggregate	Aggregate	Diesel	24763.71807	0.000122	0.003578	0.000384	7.4E-06	3.17E-05	2.91E-05	0.781586	2.59E+02
San Bernardino	2050	Industrial - Tow Tractor	Aggregate	Aggregate	Diesel	168.2187762	4.76E-07	4.4E-06	9.99E-07	5.03E-08	1.1E-07	1.01E-07	0.005309	1.76E+00
San Bernardino	2050	Industrial - Yard Goat	Aggregate	Aggregate	Diesel	199271.3918	0.000704	0.006865	0.002084	5.96E-05	0.000174	0.00016	6.289353	2.08E+03
TOTAL LIGHT COMMERCIAL + INDUSTRIAL OFFROAD						1.35E+07	4.13E-01	1.13E+00	3.04E+01	1.97E-03	1.93E-02	8.25E-03	2.74E+02	9.06E+04
ESTIMATED San Bernardino						2.11E+06	6.47E-02	1.77E-01	4.76E+00	3.08E-04	3.02E-03	1.29E-03	4.28E+01	14,185
ESTIMATED San Bernardino (lbs/day)							129	354	9,520	1	6	3	85,678	

EMPLOYMENT: http://lehd.ces.census.gov/			Existing
Employment in San Bernardino County (2024 Q2)			713,629
Employment in San Bernardino			111,690
Percent in the City			15.65%

Note: Proportion of employment in the City assumed to remain the same as existing conditions.

Solid Waste Disposal

Waste Generated for San Bernardino			Scenario	Population	% increase from Existing
Annual Year	Landfill		Existing	267,267	NA
2024	248,613		Genearl Plan Update	330,892	24%
			Current General Plan	298,300	12%

Source: CalRecycle. 2025, September 2 (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 1.09.24.2021) CH₄ Model Results.

	Existing				Genearl Plan Update		Current General Plan
	CH ₄ Tons	MTCO ₂ e w/LFG Capture 2025 TOTAL	2025 Disposal (AR5 GWPs)* 2025 TOTAL		MTCO ₂ e w/LFG Capture 2050 TOTAL		MTCO ₂ e w/LFG Capture 2050 TOTAL
Year 1	676	153	204		253		228
Year 2	4,688	1,063	1,418		1,755		1,582
Year 3 (PEAK)	5,262	1,193	1,591		1,970		1,776
Year 4	5,158	1,170	1,560		1,931		1,741
Year 5	5,056	1,147	1,529		1,893		1,706
Year 6	4,956	1,124	1,499		1,855		1,673
Year 7	4,858	1,102	1,469		1,819		1,639
Year 8	4,761	1,080	1,440		1,783		1,607
Year 9	4,667	1,058	1,411		1,747		1,575
Year 10	4,575	1,038	1,383		1,713		1,544
Year 11	4,484	1,017	1,356		1,679		1,513
Year 12	4,395	997	1,329		1,646		1,483
Year 13	4,308	977	1,303		1,613		1,454
Year 14	4,223	958	1,277		1,581		1,425
Year 15	4,139	939	1,252		1,550		1,397
Year 16	4,057	920	1,227		1,519		1,369
Year 17	3,977	902	1,203		1,489		1,342
Year 18	3,898	884	1,179		1,459		1,316
Year 19	3,821	867	1,155		1,431		1,290
Year 20	3,745	849	1,133		1,402		1,264
Year 21	3,671	833	1,110		1,374		1,239
Year 22	3,599	816	1,088		1,347		1,215
Year 23	3,527	800	1,067		1,321		1,190
Year 24	3,457	784	1,046		1,294		1,167
Year 25	3,389	769	1,025		1,269		1,144
Year 26	3,322	753	1,005		1,244		1,121
Year 27	3,256	738	985		1,219		1,099
Year 28	3,192	724	965		1,195		1,077
Year 29	3,128	710	946		1,171		1,056
Year 30	3,066	695	927		1,148		1,035
Year 31	3,006	682	909		1,125		1,014
Year 32	2,946	668	891		1,103		994
Year 33	2,888	655	873		1,081		975
Year 34	2,831	642	856		1,060		955
Year 35	2,775	629	839		1,039		936
Year 36	2,720	617	822		1,018		918
Year 37	2,666	605	806		998		900
Year 38	2,613	593	790		978		882
Year 39	2,561	581	775		959		864
Year 40	2,511	569	759		940		847
Year 41	2,461	558	744		921		831
Year 42	2,412	547	729		903		814
Year 43	2,364	536	715		885		798
Year 44	2,318	526	701		868		782
Year 45	2,272	515	687		850		767
Year 46	2,227	505	673		834		752
Year 47	2,183	495	660		817		737
Year 48	2,139	485	647		801		722
Year 49	2,097	476	634		785		708
Year 50	2,056	466	622		770		694
Year 51	2,015	457	609		754		680
Year 52	1,975	448	597		739		667
Year 53	1,936	439	585		725		653
Year 54	1,897	430	574		710		640
Year 55	1,860	422	562		696		628
Year 56	1,823	413	551		683		615
Year 57	1,787	405	540		669		603
Year 58	1,752	397	530		656		591
Year 59	1,717	389	519		643		579
Year 60	1,683	382	509		630		568
Total	187,801	42,593	56,790		70,309		63,384

Source: Landfill Emissions Tool Version 1.09.24.2021. and data from 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

¹ Waste generation based on latest annual year of waste generated by San Bernardino obtained from CalRecycle.

² 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.

³ Decomposition based on an average annual rainfall of 27 inches per year average (anaerobic decomposition factor (k) of 0.02) for San Bernardino.

⁴ 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 percent. The Landfill gas capture efficiency is based on the California Air Resources Board's (CARB) Local Government Operations Protocol (LGOP), Version 1.3.

Water and Wastewater

Water Demand for San Bernardino Provided by Fuscoe Engineering (September 2025)

Water	Existing	Update	Plan
Million Gallons Per Day (MGD)	39.67	10.61	9.35
Acre Feet Per Year (AFY)	44,437	11,882	10,468
Million Gallons Per Year (MGY) TOTAL	14,480	3,872	3,411
Wastewater	Existing	General Plan Update	Current General Plan
Gallons Per Year (GPY)	5,573,044,110	2,702,805,290	2,381,159,415
Gallons Per Day (GPD)	15,268,614	7,404,946	6,523,724
Acre Feet Per Year (AFY)	17,103	8,295	7,308
Million Gallons Per Year (MGY) TOTAL	5,573	2,703	2,381

Note:

Existing water and wastewater demands based on San Bernardino Municipal Water District 2020 Urban Water Management Plan.

Proposed GP water and wastewater demands based on San Bernardino Municipal Water Department 2015 Water Facilities Master Plan.

Current GP is estimated based on Service Population and assumes similar conservation measures.

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	General Plan Update	Current General Plan
Non-Biogenic CO ₂ e TOTAL =	1,467	712	627

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

Water and Wastewater

Location	Supply (Water Conveyance)	Water Treatment	Water Distribution	Total Water	Wastewater Treatment
see Tab G-33	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).

Southern California Edison

	Intensity factor			CO ₂ e
	CO ₂ lbs/MWH	CH ₄ lbs/MWH	N ₂ O lbs/MWH	lbs/MWh
2025	348.637	0.033	0.004	350.62
2050	260.788	0.033	0.004	262.77
	CO ₂ MTons/MWH	CH ₄ MTons/MWH	N ₂ O MTons/MWH	MTons/MWh
2025	0.158	1.50E-05	1.81E-06	0.16
2050	0.118	1.50E-05	1.81E-06	0.12

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-3, Electricity Utility Greenhouse Gas Emissions Factors

GHG Emissions from Energy Associated with Water/Wastewater

Energy Associated with Water Use	Existing Mwh	General Plan Update Mwh	Current General Plan Mwh
TOTAL Water Use	76,830	20,544	18,099
TOTAL Wastewater Generation	8,365	4,057	3,574
Total Water/Wastewater	85,195	24,601	21,673

Water and Wastewater

GHG Emissions from Energy Associated with Water Use/Wastewater Generation	Existing MTCO₂e	General Plan Update MTCO₂e	Current General Plan MTCO₂e
TOTAL Water Use	12,219	2,449	2,157
TOTAL Wastewater Generation	1,330	484	426
Total Water/Wastewater	13,550	2,932	2,583

Total GHGs

GHG Emissions from Water/Wastewater Use	Existing MTCO₂e	General Plan Update MTCO₂e	Current General Plan MTCO₂e
TOTAL Water Use	12,219	2,449	2,157
TOTAL Wastewater Generation	2,798	1,195	1,053
Total Water/Wastewater	15,017	3,644	3,210

Refrigerants

2021 Statewide Refrigerant Use (AR5)

Main Sector	Activity Subset	GHGs	Year 2021	AR4 GWPs	GHGs	AR5 GWPs	Year 2021
			MTCO ₂ e (AR4 GWPs)		Metric Ton		MTCO ₂ e (AR5 GWPs)
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							39,455,353
People MT/person							0.45

	Existing	General Plan Update	Current General Plan
Population	267,267	330,892	298,300
MTCO ₂ e	120,459	149,136	134,446

Notes:

AR4=Intergovernmental Panel on Climate Change Fourth Assessment Report

AR5=Intergovernmental Panel on Climate Change Fifth Assessment Report

GWP=Global warming potential

Source:

CARB. Greenhouse Gas Emissions Inventory Query Tool for years 2000 to 2021 (2023 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>.

Greenhouse Gas Protocol. Global Warming Potential Values. Global warming potential (GWP) values relative to CO₂. AR5. https://ghgprotocol.org/sites/default/files/Global-Warming-Potential-Values%20%28Feb%2016%202016%29_1.pdf.

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

San Bernardino - VMT

Source: KOA 2025. Based on the San Bernardino Transportation Analysis Model+ (SBTAM+)

	Daily VMT			Total Daily VMT	Total with RTAC	Service Population	VMT/SP	VMT/SP w RTAC
	IX	XI	II					
Existing (2025 Interpolation)	6,124,183	6,136,777	1,761,636	14,022,596	7,892,116	378,957	37.0	20.8
General Plan Update (2050)	7,327,527	7,307,369	2,169,838	16,804,735	9,487,287	503,082	33.4	18.9
Current Geberal Plan (No Build)	6,465,063	6,484,022	1,884,179	14,833,263	8,358,721	443,213	33.5	18.9

Notes: Total may not add to 100% due to rounding.

IX = Internal-External

XI = External- Internal

II = Internal-Internal

Modeling of vehicle miles traveled (VMT) provided by KOA is based on San Bernardino Transportation Analysis Model+ (SBTAM+). VMT from passenger vehicles and trucks that have an origin or destination in the City using a transportation origin-destination methodology. Accounting of VMT is based on the recommendations of CARB's Regional Targets Advisory Committee (RTAC) created under Senate Bill 375 (SB 375). For accounting purposes, there are three types of trips:

- » Vehicle trips that originated and terminated within the City (Internal-Internal, I-I). Using the accounting rules established by RTAC, 100 percent of the length of these trips, and their emissions, are attributed to the City.
- » Vehicle trips that either originated or terminated (but not both) within the City (Internal-External or External-Internal, I-X and X-I). Using the accounting rules established by RTAC, 50 percent of the trip length for these trips is attributed to the City.
- » Vehicle trips that neither originated nor terminated within the City. These trips are commonly called pass-through trips (External-External, X-X). Using the accounting rules established by RTAC, these trips are not counted towards the City's VMT or emissions.

San Bernardino — TRANSPORTATION SECTOR

Source: EMFAC2021 V 1.0.2, Web Database - Emissions Rates. San Bernardino (SC) Sub Area. 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.

Criteria Air Pollutant Emissions

	lbs/day					
	ROG	NO _x	CO	SO _x	PM10	PM2.5
Existing (2025)	271	2,959	14,785	65	466	177
Existing (2050)	96	1,575	8,089	50	485	174
Current General Plan (2050)	102	1,668	8,567	53	514	184
General Plan Update (2050)	116	1,893	9,724	60	583	209
Change from Existing Conditions (2025)	-156	-1,066	-5,062	-4	117	32
Change from Existing Land Uses (2050)	19	318	1,635	10	98	35
Change from Current General Plan	14	225	1,157	7	69	25

GHG EMISSIONS

	MTons/year			
	CO ₂	CH ₄	N ₂ O	CO ₂ e
Existing (2025)	1,055,602	35	58	1,071,954
Current General Plan (2050)	868,611	10	51	882,456
General Plan Update (2050)	985,888	12	58	1,001,602
Change from Existing Conditions (2025)	-69,714	-24	0	-70,352
Change from Current General Plan	117,277	1	7	119,146

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

Year 2025 Existing: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

Daily VMT		7,892,116	lbs/day					
Vehicle Type	Fuel Type	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.02%	0.38	7.17	1.19	0.04	0.41	0.26
All Other Buses	Natural Gas	0.00%	0.01	0.10	2.07	0.00	0.05	0.02
LDA	Gasoline	47.66%	63.89	294.97	5,957.67	22.64	137.95	47.54
LDA	Diesel	0.08%	0.33	2.25	4.27	0.03	0.43	0.26
LDA	Electricity	2.67%	0.00	0.00	0.00	0.00	5.74	1.64
LDA	Plug-in Hybrid	1.65%	0.37	0.84	62.26	0.38	3.58	1.12
LDT1	Gasoline	3.30%	21.04	95.80	1,043.27	1.89	10.87	4.03
LDT1	Diesel	0.00%	0.02	0.09	0.11	0.00	0.01	0.01
LDT1	Electricity	0.01%	0.00	0.00	0.00	0.00	0.02	0.01
LDT1	Plug-in Hybrid	0.01%	0.00	0.00	0.31	0.00	0.02	0.01
LDT2	Gasoline	19.43%	36.68	217.86	2,876.31	11.24	59.76	20.64
LDT2	Diesel	0.06%	0.13	0.45	1.19	0.03	0.21	0.10
LDT2	Electricity	0.14%	0.00	0.00	0.00	0.00	0.30	0.09
LDT2	Plug-in Hybrid	0.23%	0.05	0.11	8.03	0.05	0.48	0.15
LHD1	Gasoline	1.51%	6.24	41.74	273.75	1.57	22.88	7.97
LHD1	Diesel	1.03%	18.19	282.30	55.69	0.83	20.77	9.83
LHD1	Electricity	0.02%	0.00	0.00	0.00	0.00	0.20	0.07
LHD2	Gasoline	0.24%	0.56	5.77	30.72	0.28	4.14	1.44
LHD2	Diesel	0.45%	7.17	94.87	18.91	0.43	9.85	4.47
LHD2	Electricity	0.01%	0.00	0.00	0.00	0.00	0.05	0.02
MCY	Gasoline	0.29%	55.29	29.09	660.74	0.09	0.91	0.36
MDV	Gasoline	13.89%	40.23	244.40	2,509.22	9.92	43.49	15.09
MDV	Diesel	0.18%	0.46	4.24	7.66	0.13	0.78	0.40
MDV	Electricity	0.15%	0.00	0.00	0.00	0.00	0.33	0.09
MDV	Plug-in Hybrid	0.15%	0.03	0.07	5.43	0.03	0.32	0.10
MH	Gasoline	0.07%	0.49	3.99	13.92	0.21	0.66	0.22
MH	Diesel	0.03%	0.34	18.80	1.52	0.05	0.89	0.67
Motor Coach	Diesel	0.01%	0.03	4.10	0.25	0.04	0.30	0.13
OBUS	Gasoline	0.04%	0.30	2.56	7.74	0.10	0.35	0.12
OBUS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
PTO	Diesel	0.10%	0.36	49.99	4.10	0.33	0.08	0.08
PTO	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.03%	0.34	2.64	6.96	0.05	0.33	0.11
SBUS	Diesel	0.02%	0.43	23.86	1.03	0.04	0.32	0.19
SBUS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.02%	0.25	2.78	58.51	0.00	0.27	0.10
T6 CAIRP Class 4	Diesel	0.00%	0.00	0.06	0.01	0.00	0.01	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00	0.08	0.01	0.00	0.01	0.01
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00	0.18	0.02	0.01	0.03	0.01
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	0.02	1.31	0.12	0.03	0.22	0.08
T6 CAIRP Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.05%	0.20	7.30	0.80	0.09	0.62	0.28
T6 Instate Delivery Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.06%	0.11	4.89	0.55	0.11	0.68	0.27
T6 Instate Delivery Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00	0.00	0.07	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.25%	0.54	24.90	2.51	0.44	2.75	1.14
T6 Instate Delivery Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00	0.01	0.31	0.00	0.01	0.00
T6 Instate Delivery Class 7	Diesel	0.07%	0.09	7.79	0.59	0.13	0.77	0.30

T6 Instate Delivery Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00	0.04	0.73	0.00	0.02	0.01
T6 Instate Other Class 4	Diesel	0.12%	0.54	18.97	2.00	0.21	1.45	0.69
T6 Instate Other Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	0.00	0.01	0.16	0.00	0.00	0.00
T6 Instate Other Class 5	Diesel	0.31%	0.43	24.41	2.35	0.57	3.33	1.31
T6 Instate Other Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	0.00	0.02	0.35	0.00	0.01	0.00
T6 Instate Other Class 6	Diesel	0.27%	0.73	30.50	3.10	0.48	3.06	1.32
T6 Instate Other Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	0.00	0.01	0.30	0.00	0.01	0.00
T6 Instate Other Class 7	Diesel	0.17%	0.25	18.80	1.41	0.31	1.86	0.74
T6 Instate Other Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Instate Other Class 7	Natural Gas	0.01%	0.01	0.09	1.85	0.00	0.05	0.02
T6 Instate Tractor Class 6	Diesel	0.00%	0.01	0.37	0.04	0.01	0.04	0.02
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.12%	0.18	14.03	1.02	0.20	1.30	0.52
T6 Instate Tractor Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00	0.07	1.23	0.00	0.03	0.01
T6 OOS Class 4	Diesel	0.00%	0.00	0.04	0.00	0.00	0.01	0.00
T6 OOS Class 5	Diesel	0.00%	0.00	0.05	0.00	0.00	0.01	0.00
T6 OOS Class 6	Diesel	0.00%	0.00	0.13	0.01	0.00	0.02	0.01
T6 OOS Class 7	Diesel	0.01%	0.01	0.94	0.09	0.02	0.15	0.06
T6 Public Class 4	Diesel	0.01%	0.04	5.92	0.13	0.01	0.10	0.05
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	0.00	0.01	0.23	0.00	0.01	0.00
T6 Public Class 5	Diesel	0.01%	0.04	4.75	0.16	0.03	0.17	0.08
T6 Public Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	0.00	0.06	1.08	0.00	0.03	0.01
T6 Public Class 6	Diesel	0.01%	0.07	8.06	0.22	0.02	0.16	0.08
T6 Public Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	0.00	0.02	0.52	0.00	0.02	0.01
T6 Public Class 7	Diesel	0.03%	0.19	20.73	0.59	0.06	0.45	0.24
T6 Public Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	0.01	0.04	1.21	0.00	0.04	0.01
T6 Utility Class 5	Diesel	0.02%	0.01	1.02	0.08	0.03	0.16	0.06
T6 Utility Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.00	0.00	0.03	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00	0.19	0.02	0.01	0.03	0.01
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00	0.23	0.02	0.01	0.04	0.02
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00	0.00	0.02	0.00	0.00	0.00
T6TS	Gasoline	0.18%	1.42	11.55	36.56	0.51	1.77	0.60
T6TS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 CAIRP Class 8	Diesel	0.84%	1.72	204.43	7.34	2.07	20.62	9.39
T7 CAIRP Class 8	Electricity	0.01%	0.00	0.00	0.00	0.00	0.13	0.04
T7 CAIRP Class 8	Natural Gas	0.00%	0.01	0.15	2.76	0.00	0.07	0.02
T7 NNOOS Class 8	Diesel	1.01%	2.01	241.15	7.99	2.44	24.58	11.07
T7 NOOS Class 8	Diesel	0.37%	0.77	91.63	3.24	0.90	9.06	4.15
T7 POLA Class 8	Diesel	0.67%	1.29	180.28	8.23	1.80	16.26	7.29
T7 POLA Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 POLA Class 8	Natural Gas	0.01%	0.02	0.43	8.18	0.00	0.14	0.05
T7 Public Class 8	Diesel	0.06%	0.75	102.33	2.96	0.18	2.06	1.07
T7 Public Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T7 Public Class 8	Natural Gas	0.03%	0.06	1.25	23.58	0.00	0.58	0.19
T7 Single Concrete/Transit Mix	Diesel	0.06%	0.09	9.62	0.43	0.17	1.42	0.57
T7 Single Concrete/Transit Mix	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T7 Single Concrete/Transit Mix	Natural Gas	0.01%	0.01	0.25	4.53	0.00	0.11	0.04
T7 Single Dump Class 8	Diesel	0.10%	0.27	24.91	1.31	0.26	2.27	0.95
T7 Single Dump Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00

T7 Single Dump Class 8	Natural Gas	0.01%	0.02	0.39	7.27	0.00	0.13	0.04
T7 Single Other Class 8	Diesel	0.31%	0.58	57.53	2.79	0.81	6.95	2.81
T7 Single Other Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.06	0.02
T7 Single Other Class 8	Natural Gas	0.02%	0.05	0.99	18.79	0.00	0.46	0.15
T7 SWCV Class 8	Diesel	0.06%	0.03	153.91	0.13	0.39	2.90	1.06
T7 SWCV Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.05	0.02
T7 SWCV Class 8	Natural Gas	0.29%	2.47	62.52	512.94	0.00	12.72	4.32
T7 Tractor Class 8	Diesel	0.69%	1.62	178.04	7.39	1.74	16.47	7.20
T7 Tractor Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.06	0.02
T7 Tractor Class 8	Natural Gas	0.02%	0.05	1.05	19.32	0.00	0.45	0.15
T7 Utility Class 8	Diesel	0.01%	0.02	2.19	0.12	0.03	0.28	0.11
T7 Utility Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	0.11	0.78	6.30	0.00	0.01	0.00
T7IS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.01%	0.01	0.09	1.15	0.01	0.22	0.08
UBUS	Diesel	0.00%	0.01	0.04	0.01	0.00	0.02	0.01
UBUS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.04	0.01
UBUS	Natural Gas	0.08%	0.57	6.34	465.33	0.00	1.95	0.66
TOTAL		100%	271.06	2958.72	14785.49	64.50	466.40	176.81

Year 2025 Existing: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping Plan Measure Documentation Supplement.

		CO ₂	CH ₄	N ₂ O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	2,738,564,297	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
All Other Buses	Diesel	0.02%	625.36	0.00	0.10	651.54
All Other Buses	Natural Gas	0.00%	117.46	0.07	0.02	125.88
LDA	Gasoline	47.66%	360,488.69	2.78	5.65	362,064.88
LDA	Diesel	0.08%	532.13	0.00	0.08	554.42
LDA	Electricity	2.67%	0.00	0.00	0.00	0.00
LDA	Plug-in Hybrid	1.65%	6,021.01	0.02	0.02	6,028.12
LDT1	Gasoline	3.30%	30,123.30	0.74	1.06	30,425.73
LDT1	Diesel	0.00%	3.78	0.00	0.00	3.95
LDT1	Electricity	0.01%	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.01%	29.89	0.00	0.00	29.92
LDT2	Gasoline	19.43%	178,970.86	1.50	3.06	179,822.82
LDT2	Diesel	0.06%	485.52	0.00	0.08	505.81
LDT2	Electricity	0.14%	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.23%	775.03	0.00	0.00	775.93
LHD1	Gasoline	1.51%	24,949.99	0.20	0.37	25,054.49
LHD1	Diesel	1.03%	13,824.52	0.13	2.18	14,405.43
LHD1	Electricity	0.02%	0.00	0.00	0.00	0.00
LHD2	Gasoline	0.24%	4,477.73	0.02	0.06	4,493.52
LHD2	Diesel	0.45%	7,109.61	0.05	1.12	7,407.91
LHD2	Electricity	0.01%	0.00	0.00	0.00	0.00
MCY	Gasoline	0.29%	1,511.27	1.33	0.32	1,632.62
MDV	Gasoline	13.89%	157,949.04	1.54	2.97	158,778.61
MDV	Diesel	0.18%	2,087.22	0.00	0.33	2,174.45
MDV	Electricity	0.15%	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.15%	524.23	0.00	0.00	524.84
MH	Gasoline	0.07%	3,274.58	0.02	0.04	3,286.04
MH	Diesel	0.03%	768.74	0.00	0.12	800.90
Motor Coach	Diesel	0.01%	687.81	0.00	0.11	716.54
OBUS	Gasoline	0.04%	1,612.16	0.01	0.02	1,617.59
OBUS	Electricity	0.00%	0.00	0.00	0.00	0.00
PTO	Diesel	0.10%	5,541.61	0.00	0.87	5,773.05
PTO	Electricity	0.00%	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.03%	826.15	0.01	0.02	832.68
SBUS	Diesel	0.02%	617.63	0.00	0.10	643.51
SBUS	Electricity	0.00%	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.02%	1,100.83	2.80	0.22	1,238.65
T6 CAIRP Class 4	Diesel	0.00%	27.33	0.00	0.00	28.47
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	37.58	0.00	0.01	39.15
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	95.80	0.00	0.02	99.80
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.02%	568.70	0.00	0.09	592.45
T6 CAIRP Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.36	0.00	0.00	0.38
T6 Instate Delivery Class 4	Diesel	0.05%	1,527.63	0.00	0.24	1,591.45
T6 Instate Delivery Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	4.45	0.00	0.00	4.77
T6 Instate Delivery Class 5	Diesel	0.06%	1,886.31	0.00	0.30	1,965.09
T6 Instate Delivery Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 5	Natural Gas	0.00%	4.27	0.00	0.00	4.57
T6 Instate Delivery Class 6	Diesel	0.25%	7,395.26	0.00	1.17	7,704.13

Year 2025 Existing: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping Plan Measure Documentation Supplement.

		CO ₂	CH ₄	N ₂ O
		AR5 GWP	AR5 GWP	AR5 GWP
Annual VMT	2,738,564,297	1	28	265

Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
T6 Instate Delivery Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	18.90	0.01	0.00	20.25
T6 Instate Delivery Class 7	Diesel	0.07%	2,124.19	0.00	0.33	2,212.90
T6 Instate Delivery Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	42.79	0.02	0.01	45.77
T6 Instate Other Class 4	Diesel	0.12%	3,502.92	0.00	0.55	3,649.28
T6 Instate Other Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	9.83	0.01	0.00	10.53
T6 Instate Other Class 5	Diesel	0.31%	9,451.99	0.00	1.49	9,846.71
T6 Instate Other Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	21.54	0.01	0.00	23.06
T6 Instate Other Class 6	Diesel	0.27%	8,017.60	0.01	1.26	8,352.49
T6 Instate Other Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	18.40	0.01	0.00	19.70
T6 Instate Other Class 7	Diesel	0.17%	5,082.05	0.00	0.80	5,294.28
T6 Instate Other Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.01%	113.81	0.07	0.02	121.79
T6 Instate Tractor Class 6	Diesel	0.00%	90.94	0.00	0.01	94.74
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.25	0.00	0.00	0.27
T6 Instate Tractor Class 7	Diesel	0.12%	3,402.36	0.00	0.54	3,544.45
T6 Instate Tractor Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	71.34	0.04	0.01	76.31
T6 OOS Class 4	Diesel	0.00%	16.18	0.00	0.00	16.85
T6 OOS Class 5	Diesel	0.00%	22.23	0.00	0.00	23.16
T6 OOS Class 6	Diesel	0.00%	56.79	0.00	0.01	59.16
T6 OOS Class 7	Diesel	0.01%	389.82	0.00	0.06	406.10
T6 Public Class 4	Diesel	0.01%	222.70	0.00	0.04	232.00
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	15.92	0.01	0.00	17.06
T6 Public Class 5	Diesel	0.01%	441.28	0.00	0.07	459.71
T6 Public Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	65.08	0.04	0.01	69.65
T6 Public Class 6	Diesel	0.01%	344.01	0.00	0.05	358.38
T6 Public Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	34.68	0.02	0.01	37.15
T6 Public Class 7	Diesel	0.03%	960.70	0.00	0.15	1,000.85
T6 Public Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	88.48	0.06	0.02	94.88
T6 Utility Class 5	Diesel	0.02%	459.54	0.00	0.07	478.73
T6 Utility Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	1.99	0.00	0.00	2.13
T6 Utility Class 6	Diesel	0.00%	86.10	0.00	0.01	89.70
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.64	0.00	0.00	0.69
T6 Utility Class 7	Diesel	0.00%	119.56	0.00	0.02	124.56
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.94	0.00	0.00	1.00
T6TS	Gasoline	0.18%	8,049.73	0.05	0.10	8,076.29
T6TS	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Diesel	0.84%	34,447.91	0.01	5.43	35,886.49

Year 2025 Existing: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping Plan Measure Documentation Supplement.

		CO₂ CH₄ N₂O				
		AR5 GWP AR5 GWP AR5 GWP				
Annual VMT	2,738,564,297	1	28	265		

Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
T7 CAIRP Class 8	Electricity	0.01%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	103.92	0.08	0.02	111.88
T7 NNOOS Class 8	Diesel	1.01%	40,502.85	0.01	6.38	42,194.29
T7 NOOS Class 8	Diesel	0.37%	14,889.58	0.01	2.35	15,511.39
T7 POLA Class 8	Diesel	0.67%	29,911.93	0.01	4.71	31,161.05
T7 POLA Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.01%	232.39	0.17	0.05	249.74
T7 Public Class 8	Diesel	0.06%	2,945.38	0.01	0.46	3,068.50
T7 Public Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.03%	895.24	0.72	0.18	963.63
T7 Single Concrete/Transit Mix	Diesel	0.06%	2,798.60	0.00	0.44	2,915.46
T7 Single Concrete/Transit Mix	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.01%	174.78	0.14	0.04	188.16
T7 Single Dump Class 8	Diesel	0.10%	4,357.55	0.00	0.69	4,539.54
T7 Single Dump Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.01%	224.85	0.17	0.05	241.70
T7 Single Other Class 8	Diesel	0.31%	13,487.77	0.00	2.13	14,051.01
T7 Single Other Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.02%	724.22	0.58	0.15	779.47
T7 SWCV Class 8	Diesel	0.06%	6,481.77	0.00	1.02	6,752.39
T7 SWCV Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.29%	8,973.68	15.95	1.83	9,905.18
T7 Tractor Class 8	Diesel	0.69%	28,944.75	0.01	4.56	30,153.55
T7 Tractor Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.02%	725.46	0.56	0.15	780.44
T7 Utility Class 8	Diesel	0.01%	563.26	0.00	0.09	586.78
T7 Utility Class 8	Electricity	0.00%	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	24.75	0.00	0.00	25.64
T7IS	Electricity	0.00%	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.01%	227.51	0.00	0.00	228.00
UBUS	Diesel	0.00%	28.69	0.00	0.00	29.89
UBUS	Electricity	0.00%	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.08%	4,006.07	5.24	0.82	4,369.32
Total		100%	1055602.02	35.31	57.98	1071954.14

Year 2050 Current General Plan: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

Daily VMT		8,358,721	lbs/day					
Vehicle Type	Fuel Type	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.02%	0.04	1.92	0.23	0.03	0.22	0.09
All Other Buses	Natural Gas	0.01%	0.01	0.07	2.48	0.00	0.06	0.02
LDA	Gasoline	40.49%	21.02	140.35	3,692.69	16.64	120.17	38.12
LDA	Diesel	0.02%	0.02	0.04	0.52	0.01	0.07	0.02
LDA	Electricity	5.10%	0.00	0.00	0.00	0.00	11.65	3.32
LDA	Plug-in Hybrid	1.90%	0.39	0.88	64.87	0.39	4.27	1.25
LDT1	Gasoline	2.48%	1.40	9.24	241.73	1.17	7.97	2.56
LDT1	Diesel	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.08%	0.00	0.00	0.00	0.00	0.18	0.05
LDT1	Plug-in Hybrid	0.06%	0.01	0.03	2.11	0.01	0.14	0.04
LDT2	Gasoline	21.01%	15.24	82.48	2,258.07	10.31	67.12	21.47
LDT2	Diesel	0.08%	0.17	0.40	1.81	0.04	0.31	0.13
LDT2	Electricity	0.59%	0.00	0.00	0.00	0.00	1.35	0.39
LDT2	Plug-in Hybrid	0.59%	0.12	0.27	19.99	0.12	1.32	0.39
LHD1	Gasoline	0.73%	0.20	2.08	77.28	0.64	11.69	4.07
LHD1	Diesel	0.48%	3.44	14.00	6.47	0.39	9.00	3.62
LHD1	Electricity	1.19%	0.00	0.00	0.00	0.00	10.32	3.44
LHD2	Gasoline	0.09%	0.02	0.34	9.33	0.09	1.60	0.56
LHD2	Diesel	0.23%	2.08	9.99	3.99	0.22	4.96	2.04
LHD2	Electricity	0.29%	0.00	0.00	0.00	0.00	2.87	0.96
MCY	Gasoline	0.25%	34.68	20.65	433.11	0.08	0.84	0.33
MDV	Gasoline	12.61%	9.43	51.08	1,392.90	7.49	40.58	13.00
MDV	Diesel	0.14%	0.10	0.28	3.31	0.08	0.45	0.15
MDV	Electricity	0.55%	0.00	0.00	0.00	0.00	1.26	0.36
MDV	Plug-in Hybrid	0.38%	0.08	0.18	13.14	0.08	0.87	0.25
MH	Gasoline	0.03%	0.03	1.18	0.78	0.10	0.33	0.11
MH	Diesel	0.02%	0.10	5.88	0.31	0.03	0.25	0.12
Motor Coach	Diesel	0.01%	0.02	2.44	0.16	0.04	0.32	0.13
OBUS	Gasoline	0.01%	0.01	0.44	0.28	0.03	0.10	0.03
OBUS	Electricity	0.01%	0.00	0.00	0.00	0.00	0.08	0.03
PTO	Diesel	0.07%	0.18	31.28	2.24	0.21	0.05	0.05
PTO	Electricity	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.02	0.19	0.34	0.01	0.10	0.03
SBUS	Diesel	0.00%	0.01	0.33	0.06	0.01	0.05	0.02
SBUS	Electricity	0.03%	0.00	0.00	0.00	0.00	0.17	0.05
SBUS	Natural Gas	0.01%	0.10	0.45	19.15	0.00	0.14	0.05
T6 CAIRP Class 4	Diesel	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00	0.07	0.01	0.00	0.02	0.01
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 CAIRP Class 7	Diesel	0.03%	0.02	0.89	0.15	0.04	0.28	0.11
T6 CAIRP Class 7	Electricity	0.01%	0.00	0.00	0.00	0.00	0.05	0.02
T6 CAIRP Class 7	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.04%	0.03	1.27	0.22	0.06	0.39	0.15
T6 Instate Delivery Class 4	Electricity	0.05%	0.00	0.00	0.00	0.00	0.30	0.09
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00	0.00	0.09	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.04%	0.04	1.54	0.27	0.08	0.48	0.18
T6 Instate Delivery Class 5	Electricity	0.06%	0.00	0.00	0.00	0.00	0.37	0.11
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00	0.00	0.11	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.18%	0.15	6.22	1.06	0.30	1.90	0.70
T6 Instate Delivery Class 6	Electricity	0.24%	0.00	0.00	0.00	0.00	1.45	0.46
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00	0.01	0.44	0.00	0.01	0.00
T6 Instate Delivery Class 7	Diesel	0.07%	0.07	3.52	0.48	0.11	0.73	0.28

T6 Instate Delivery Class 7	Electricity	0.05%	0.00	0.00	0.00	0.00	0.33	0.10
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00	0.02	0.54	0.00	0.02	0.01
T6 Instate Other Class 4	Diesel	0.08%	0.07	2.80	0.48	0.14	0.88	0.33
T6 Instate Other Class 4	Electricity	0.11%	0.00	0.00	0.00	0.00	0.69	0.22
T6 Instate Other Class 4	Natural Gas	0.00%	0.00	0.01	0.20	0.00	0.01	0.00
T6 Instate Other Class 5	Diesel	0.22%	0.19	7.43	1.29	0.37	2.35	0.87
T6 Instate Other Class 5	Electricity	0.30%	0.00	0.00	0.00	0.00	1.85	0.58
T6 Instate Other Class 5	Natural Gas	0.00%	0.00	0.01	0.54	0.00	0.02	0.01
T6 Instate Other Class 6	Diesel	0.19%	0.16	6.48	1.11	0.32	2.01	0.75
T6 Instate Other Class 6	Electricity	0.26%	0.00	0.00	0.00	0.00	1.58	0.50
T6 Instate Other Class 6	Natural Gas	0.00%	0.00	0.01	0.46	0.00	0.01	0.01
T6 Instate Other Class 7	Diesel	0.15%	0.15	7.34	1.03	0.26	1.66	0.62
T6 Instate Other Class 7	Electricity	0.14%	0.00	0.00	0.00	0.00	0.86	0.27
T6 Instate Other Class 7	Natural Gas	0.00%	0.01	0.04	1.19	0.00	0.04	0.01
T6 Instate Tractor Class 6	Diesel	0.00%	0.00	0.07	0.01	0.00	0.02	0.01
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.16%	0.16	7.32	1.07	0.24	1.73	0.65
T6 Instate Tractor Class 7	Electricity	0.04%	0.00	0.00	0.00	0.00	0.26	0.08
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.01	0.04	1.21	0.00	0.04	0.01
T6 OOS Class 4	Diesel	0.00%	0.00	0.04	0.00	0.00	0.01	0.00
T6 OOS Class 5	Diesel	0.00%	0.00	0.05	0.01	0.00	0.01	0.01
T6 OOS Class 6	Diesel	0.00%	0.00	0.13	0.02	0.01	0.03	0.01
T6 OOS Class 7	Diesel	0.02%	0.02	0.97	0.13	0.03	0.26	0.10
T6 Public Class 4	Diesel	0.00%	0.00	0.12	0.02	0.01	0.03	0.01
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Public Class 4	Natural Gas	0.00%	0.00	0.01	0.18	0.00	0.01	0.00
T6 Public Class 5	Diesel	0.01%	0.01	0.28	0.04	0.01	0.07	0.03
T6 Public Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00	0.05	0.02
T6 Public Class 5	Natural Gas	0.00%	0.00	0.01	0.42	0.00	0.01	0.00
T6 Public Class 6	Diesel	0.01%	0.00	0.19	0.03	0.01	0.06	0.02
T6 Public Class 6	Electricity	0.01%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Public Class 6	Natural Gas	0.00%	0.00	0.01	0.30	0.00	0.01	0.00
T6 Public Class 7	Diesel	0.02%	0.01	0.57	0.08	0.03	0.17	0.06
T6 Public Class 7	Electricity	0.02%	0.00	0.00	0.00	0.00	0.10	0.03
T6 Public Class 7	Natural Gas	0.00%	0.00	0.03	0.92	0.00	0.03	0.01
T6 Utility Class 5	Diesel	0.01%	0.00	0.15	0.03	0.01	0.07	0.02
T6 Utility Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00	0.06	0.02
T6 Utility Class 5	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00	0.03	0.01	0.00	0.01	0.00
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00	0.04	0.01	0.00	0.02	0.01
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.07%	0.09	0.72	1.76	0.17	0.68	0.23
T6TS	Electricity	0.09%	0.00	0.00	0.00	0.00	0.55	0.17
T7 CAIRP Class 8	Diesel	1.20%	2.38	248.68	7.98	2.65	32.58	14.41
T7 CAIRP Class 8	Electricity	0.35%	0.00	0.00	0.00	0.00	5.03	1.53
T7 CAIRP Class 8	Natural Gas	0.00%	0.01	0.12	2.31	0.00	0.10	0.03
T7 NNOOS Class 8	Diesel	1.85%	3.55	422.92	11.92	3.90	49.93	22.02
T7 NOOS Class 8	Diesel	0.67%	1.33	157.99	4.47	1.42	18.33	8.19
T7 POLA Class 8	Diesel	0.68%	1.25	138.33	4.44	1.59	18.01	7.74
T7 POLA Class 8	Electricity	0.14%	0.00	0.00	0.00	0.00	1.94	0.59
T7 POLA Class 8	Natural Gas	0.03%	0.07	0.76	14.89	0.00	0.61	0.20
T7 Public Class 8	Diesel	0.02%	0.05	4.26	0.18	0.05	0.44	0.18
T7 Public Class 8	Electricity	0.04%	0.00	0.00	0.00	0.00	0.59	0.18
T7 Public Class 8	Natural Gas	0.03%	0.08	0.96	18.59	0.00	0.70	0.23
T7 Single Concrete/Transit Mix	Diesel	0.03%	0.04	3.22	0.14	0.06	0.64	0.25
T7 Single Concrete/Transit Mix	Electricity	0.04%	0.00	0.00	0.00	0.00	0.56	0.17
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.00	0.06	1.13	0.00	0.05	0.01
T7 Single Dump Class 8	Diesel	0.05%	0.08	7.41	0.30	0.11	1.15	0.47
T7 Single Dump Class 8	Electricity	0.05%	0.00	0.00	0.00	0.00	0.74	0.22
T7 Single Dump Class 8	Natural Gas	0.00%	0.01	0.11	2.12	0.00	0.08	0.03

T7 Single Other Class 8	Diesel	0.26%	0.41	38.86	1.56	0.66	6.64	2.66
T7 Single Other Class 8	Electricity	0.33%	0.00	0.00	0.00	0.00	4.74	1.44
T7 Single Other Class 8	Natural Gas	0.02%	0.05	0.59	11.75	0.00	0.46	0.15
T7 SWCV Class 8	Diesel	0.00%	0.00	1.30	0.01	0.01	0.08	0.03
T7 SWCV Class 8	Electricity	0.16%	0.00	0.00	0.00	0.00	4.16	1.35
T7 SWCV Class 8	Natural Gas	0.18%	0.17	5.68	196.62	0.00	8.37	2.82
T7 Tractor Class 8	Diesel	1.06%	1.92	209.64	6.58	2.32	27.83	11.91
T7 Tractor Class 8	Electricity	0.23%	0.00	0.00	0.00	0.00	3.34	1.01
T7 Tractor Class 8	Natural Gas	0.03%	0.07	0.82	15.70	0.00	0.65	0.21
T7 Utility Class 8	Diesel	0.01%	0.01	0.86	0.04	0.02	0.16	0.06
T7 Utility Class 8	Electricity	0.01%	0.00	0.00	0.00	0.00	0.08	0.03
T7IS	Gasoline	0.00%	0.01	0.10	1.02	0.00	0.00	0.00
T7IS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.02%	0.00	0.06	1.64	0.02	0.31	0.11
UBUS	Electricity	0.10%	0.00	0.00	0.00	0.00	1.70	0.53
UBUS	Natural Gas	0.02%	0.13	0.34	0.16	0.00	0.33	0.12
total		100%	101.78	1667.99	8566.88	53.24	513.98	184.12

Year 2050 Proposed General Plan: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

Daily VMT		9,487,287	lbs/day					
Vehicle Type	Fuel Type	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.02%	0.04	2.18	0.27	0.04	0.25	0.10
All Other Buses	Natural Gas	0.01%	0.01	0.08	2.81	0.00	0.07	0.02
LDA	Gasoline	40.49%	23.85	159.30	4,191.27	18.89	136.40	43.27
LDA	Diesel	0.02%	0.02	0.04	0.59	0.01	0.08	0.03
LDA	Electricity	5.10%	0.00	0.00	0.00	0.00	13.22	3.77
LDA	Plug-in Hybrid	1.90%	0.44	0.99	73.63	0.45	4.85	1.42
LDT1	Gasoline	2.48%	1.59	10.48	274.37	1.33	9.05	2.90
LDT1	Diesel	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.08%	0.00	0.00	0.00	0.00	0.20	0.06
LDT1	Plug-in Hybrid	0.06%	0.01	0.03	2.40	0.01	0.16	0.05
LDT2	Gasoline	21.01%	17.29	93.62	2,562.94	11.70	76.18	24.37
LDT2	Diesel	0.08%	0.19	0.45	2.05	0.04	0.35	0.15
LDT2	Electricity	0.59%	0.00	0.00	0.00	0.00	1.54	0.44
LDT2	Plug-in Hybrid	0.59%	0.14	0.31	22.69	0.14	1.50	0.44
LHD1	Gasoline	0.73%	0.22	2.36	87.71	0.73	13.27	4.62
LHD1	Diesel	0.48%	3.91	15.89	7.35	0.44	10.21	4.11
LHD1	Electricity	1.19%	0.00	0.00	0.00	0.00	11.72	3.90
LHD2	Gasoline	0.09%	0.02	0.39	10.60	0.10	1.82	0.63
LHD2	Diesel	0.23%	2.36	11.33	4.53	0.25	5.63	2.32
LHD2	Electricity	0.29%	0.00	0.00	0.00	0.00	3.26	1.09
MCY	Gasoline	0.25%	39.36	23.43	491.59	0.10	0.96	0.38
MDV	Gasoline	12.61%	10.70	57.98	1,580.97	8.50	46.06	14.75
MDV	Diesel	0.14%	0.12	0.32	3.75	0.09	0.51	0.17
MDV	Electricity	0.55%	0.00	0.00	0.00	0.00	1.43	0.41
MDV	Plug-in Hybrid	0.38%	0.09	0.20	14.91	0.09	0.98	0.29
MH	Gasoline	0.03%	0.04	1.34	0.88	0.12	0.37	0.13
MH	Diesel	0.02%	0.12	6.67	0.35	0.04	0.29	0.14
Motor Coach	Diesel	0.01%	0.03	2.77	0.19	0.04	0.36	0.15
OBUS	Gasoline	0.01%	0.01	0.50	0.32	0.03	0.12	0.04
OBUS	Electricity	0.01%	0.00	0.00	0.00	0.00	0.10	0.03
PTO	Diesel	0.07%	0.20	35.50	2.55	0.24	0.06	0.05
PTO	Electricity	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.02	0.21	0.38	0.01	0.11	0.04
SBUS	Diesel	0.00%	0.01	0.38	0.06	0.01	0.06	0.02
SBUS	Electricity	0.03%	0.00	0.00	0.00	0.00	0.19	0.06
SBUS	Natural Gas	0.01%	0.11	0.51	21.74	0.00	0.16	0.06
T6 CAIRP Class 4	Diesel	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00	0.08	0.01	0.00	0.03	0.01
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 CAIRP Class 7	Diesel	0.03%	0.03	1.01	0.17	0.04	0.32	0.12
T6 CAIRP Class 7	Electricity	0.01%	0.00	0.00	0.00	0.00	0.06	0.02
T6 CAIRP Class 7	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.04%	0.04	1.45	0.25	0.07	0.45	0.17
T6 Instate Delivery Class 4	Electricity	0.05%	0.00	0.00	0.00	0.00	0.34	0.11
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00	0.00	0.11	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.04%	0.04	1.74	0.30	0.09	0.54	0.20
T6 Instate Delivery Class 5	Electricity	0.06%	0.00	0.00	0.00	0.00	0.41	0.13
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00	0.00	0.13	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.18%	0.17	7.06	1.21	0.34	2.16	0.80
T6 Instate Delivery Class 6	Electricity	0.24%	0.00	0.00	0.00	0.00	1.65	0.52
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00	0.01	0.50	0.00	0.02	0.01
T6 Instate Delivery Class 7	Diesel	0.07%	0.08	4.00	0.55	0.13	0.83	0.31

T6 Instate Delivery Class 7	Electricity	0.05%	0.00	0.00	0.00	0.00	0.37	0.12
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00	0.02	0.61	0.00	0.02	0.01
T6 Instate Other Class 4	Diesel	0.08%	0.08	3.17	0.55	0.16	1.00	0.37
T6 Instate Other Class 4	Electricity	0.11%	0.00	0.00	0.00	0.00	0.79	0.25
T6 Instate Other Class 4	Natural Gas	0.00%	0.00	0.01	0.23	0.00	0.01	0.00
T6 Instate Other Class 5	Diesel	0.22%	0.21	8.44	1.47	0.42	2.66	0.99
T6 Instate Other Class 5	Electricity	0.30%	0.00	0.00	0.00	0.00	2.10	0.66
T6 Instate Other Class 5	Natural Gas	0.00%	0.00	0.02	0.61	0.00	0.02	0.01
T6 Instate Other Class 6	Diesel	0.19%	0.18	7.36	1.26	0.36	2.29	0.85
T6 Instate Other Class 6	Electricity	0.26%	0.00	0.00	0.00	0.00	1.80	0.56
T6 Instate Other Class 6	Natural Gas	0.00%	0.00	0.01	0.52	0.00	0.02	0.01
T6 Instate Other Class 7	Diesel	0.15%	0.17	8.33	1.17	0.29	1.88	0.71
T6 Instate Other Class 7	Electricity	0.14%	0.00	0.00	0.00	0.00	0.98	0.31
T6 Instate Other Class 7	Natural Gas	0.00%	0.01	0.04	1.35	0.00	0.04	0.01
T6 Instate Tractor Class 6	Diesel	0.00%	0.00	0.08	0.01	0.00	0.03	0.01
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.16%	0.18	8.31	1.21	0.28	1.96	0.74
T6 Instate Tractor Class 7	Electricity	0.04%	0.00	0.00	0.00	0.00	0.30	0.09
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.01	0.04	1.37	0.00	0.04	0.01
T6 OOS Class 4	Diesel	0.00%	0.00	0.04	0.01	0.00	0.01	0.00
T6 OOS Class 5	Diesel	0.00%	0.00	0.06	0.01	0.00	0.02	0.01
T6 OOS Class 6	Diesel	0.00%	0.00	0.14	0.02	0.01	0.04	0.01
T6 OOS Class 7	Diesel	0.02%	0.02	1.11	0.15	0.04	0.29	0.11
T6 Public Class 4	Diesel	0.00%	0.00	0.14	0.02	0.01	0.04	0.01
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.03	0.01
T6 Public Class 4	Natural Gas	0.00%	0.00	0.01	0.21	0.00	0.01	0.00
T6 Public Class 5	Diesel	0.01%	0.01	0.32	0.04	0.01	0.08	0.03
T6 Public Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00	0.06	0.02
T6 Public Class 5	Natural Gas	0.00%	0.00	0.02	0.48	0.00	0.02	0.01
T6 Public Class 6	Diesel	0.01%	0.01	0.22	0.03	0.01	0.06	0.02
T6 Public Class 6	Electricity	0.01%	0.00	0.00	0.00	0.00	0.05	0.01
T6 Public Class 6	Natural Gas	0.00%	0.00	0.01	0.34	0.00	0.01	0.00
T6 Public Class 7	Diesel	0.02%	0.02	0.65	0.09	0.03	0.20	0.07
T6 Public Class 7	Electricity	0.02%	0.00	0.00	0.00	0.00	0.11	0.04
T6 Public Class 7	Natural Gas	0.00%	0.00	0.03	1.05	0.00	0.04	0.01
T6 Utility Class 5	Diesel	0.01%	0.00	0.16	0.03	0.01	0.07	0.03
T6 Utility Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00	0.07	0.02
T6 Utility Class 5	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00	0.03	0.01	0.00	0.01	0.01
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00	0.04	0.01	0.00	0.02	0.01
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Utility Class 7	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.07%	0.10	0.82	1.99	0.19	0.77	0.26
T6TS	Electricity	0.09%	0.00	0.00	0.00	0.00	0.63	0.20
T7 CAIRP Class 8	Diesel	1.20%	2.70	282.26	9.06	3.01	36.97	16.35
T7 CAIRP Class 8	Electricity	0.35%	0.00	0.00	0.00	0.00	5.71	1.73
T7 CAIRP Class 8	Natural Gas	0.00%	0.01	0.14	2.63	0.00	0.11	0.04
T7 NNOOS Class 8	Diesel	1.85%	4.03	480.03	13.53	4.43	56.67	25.00
T7 NOOS Class 8	Diesel	0.67%	1.51	179.32	5.07	1.61	20.81	9.30
T7 POLA Class 8	Diesel	0.68%	1.41	157.01	5.03	1.81	20.44	8.79
T7 POLA Class 8	Electricity	0.14%	0.00	0.00	0.00	0.00	2.20	0.67
T7 POLA Class 8	Natural Gas	0.03%	0.07	0.87	16.90	0.00	0.69	0.23
T7 Public Class 8	Diesel	0.02%	0.06	4.83	0.20	0.05	0.50	0.20
T7 Public Class 8	Electricity	0.04%	0.00	0.00	0.00	0.00	0.67	0.20
T7 Public Class 8	Natural Gas	0.03%	0.09	1.10	21.10	0.00	0.79	0.26
T7 Single Concrete/Transit Mix	Diesel	0.03%	0.04	3.65	0.16	0.07	0.73	0.28
T7 Single Concrete/Transit Mix	Electricity	0.04%	0.00	0.00	0.00	0.00	0.64	0.19
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.01	0.06	1.28	0.00	0.05	0.02
T7 Single Dump Class 8	Diesel	0.05%	0.09	8.41	0.34	0.13	1.31	0.53
T7 Single Dump Class 8	Electricity	0.05%	0.00	0.00	0.00	0.00	0.84	0.25
T7 Single Dump Class 8	Natural Gas	0.00%	0.01	0.12	2.41	0.00	0.09	0.03

T7 Single Other Class 8	Diesel	0.26%	0.47	44.10	1.77	0.75	7.54	3.01
T7 Single Other Class 8	Electricity	0.33%	0.00	0.00	0.00	0.00	5.38	1.64
T7 Single Other Class 8	Natural Gas	0.02%	0.06	0.67	13.34	0.00	0.52	0.17
T7 SWCV Class 8	Diesel	0.00%	0.00	1.47	0.01	0.01	0.09	0.03
T7 SWCV Class 8	Electricity	0.16%	0.00	0.00	0.00	0.00	4.72	1.53
T7 SWCV Class 8	Natural Gas	0.18%	0.19	6.44	223.17	0.00	9.50	3.20
T7 Tractor Class 8	Diesel	1.06%	2.18	237.94	7.47	2.64	31.59	13.51
T7 Tractor Class 8	Electricity	0.23%	0.00	0.00	0.00	0.00	3.79	1.15
T7 Tractor Class 8	Natural Gas	0.03%	0.08	0.93	17.82	0.00	0.74	0.24
T7 Utility Class 8	Diesel	0.01%	0.01	0.97	0.05	0.02	0.18	0.07
T7 Utility Class 8	Electricity	0.01%	0.00	0.00	0.00	0.00	0.10	0.03
T7IS	Gasoline	0.00%	0.01	0.11	1.16	0.00	0.01	0.00
T7IS	Electricity	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.02%	0.00	0.06	1.86	0.02	0.35	0.12
UBUS	Electricity	0.10%	0.00	0.00	0.00	0.00	1.93	0.60
UBUS	Natural Gas	0.02%	0.15	0.39	0.18	0.00	0.37	0.14
total		100%	115.52	1893.19	9723.56	60.43	583.37	208.98

Existing Year 2050: Criteria Air Pollutants

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates.San Bernardino (SC) Sub-Area.

Daily VMT		7,892,116	lbs/day					
Vehicle Type	Fuel Type	Percent of VMT	ROG	NOx	CO	SOx	PM10	PM2.5
All Other Buses	Diesel	0.02%	0.04	1.82	0.22	0.03	0.21	0.08
All Other Buses	Natural Gas	0.01%	0.01	0.07	2.34	0.00	0.06	0.02
LDA	Gasoline	40.49%	19.84	132.52	3,486.56	15.71	113.46	36.00
LDA	Diesel	0.02%	0.02	0.04	0.49	0.01	0.07	0.02
LDA	Electricity	5.10%	0.00	0.00	0.00	0.00	11.00	3.14
LDA	Plug-in Hybrid	1.90%	0.37	0.83	61.25	0.37	4.04	1.18
LDT1	Gasoline	2.48%	1.32	8.72	228.24	1.11	7.53	2.41
LDT1	Diesel	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
LDT1	Electricity	0.08%	0.00	0.00	0.00	0.00	0.17	0.05
LDT1	Plug-in Hybrid	0.06%	0.01	0.03	1.99	0.01	0.13	0.04
LDT2	Gasoline	21.01%	14.38	77.88	2,132.02	9.74	63.37	20.27
LDT2	Diesel	0.08%	0.16	0.38	1.71	0.03	0.29	0.13
LDT2	Electricity	0.59%	0.00	0.00	0.00	0.00	1.28	0.36
LDT2	Plug-in Hybrid	0.59%	0.11	0.25	18.87	0.11	1.24	0.37
LHD1	Gasoline	0.73%	0.18	1.96	72.96	0.61	11.04	3.84
LHD1	Diesel	0.48%	3.25	13.22	6.11	0.37	8.49	3.42
LHD1	Electricity	1.19%	0.00	0.00	0.00	0.00	9.75	3.25
LHD2	Gasoline	0.09%	0.02	0.32	8.81	0.08	1.51	0.53
LHD2	Diesel	0.23%	1.97	9.43	3.77	0.20	4.69	1.93
LHD2	Electricity	0.29%	0.00	0.00	0.00	0.00	2.71	0.91
MCY	Gasoline	0.25%	32.74	19.49	408.93	0.08	0.79	0.32
MDV	Gasoline	12.61%	8.90	48.23	1,315.15	7.07	38.32	12.27
MDV	Diesel	0.14%	0.10	0.27	3.12	0.07	0.43	0.14
MDV	Electricity	0.55%	0.00	0.00	0.00	0.00	1.19	0.34
MDV	Plug-in Hybrid	0.38%	0.07	0.17	12.40	0.08	0.82	0.24
MH	Gasoline	0.03%	0.03	1.12	0.73	0.10	0.31	0.11
MH	Diesel	0.02%	0.10	5.55	0.29	0.03	0.24	0.11
Motor Coach	Diesel	0.01%	0.02	2.30	0.15	0.03	0.30	0.12
OBUS	Gasoline	0.01%	0.01	0.42	0.27	0.02	0.10	0.03
OBUS	Electricity	0.01%	0.00	0.00	0.00	0.00	0.08	0.02
PTO	Diesel	0.07%	0.17	29.53	2.12	0.20	0.05	0.04
PTO	Electricity	0.08%	0.00	0.00	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	0.02	0.18	0.32	0.01	0.09	0.03
SBUS	Diesel	0.00%	0.01	0.31	0.05	0.01	0.05	0.02
SBUS	Electricity	0.03%	0.00	0.00	0.00	0.00	0.16	0.05
SBUS	Natural Gas	0.01%	0.09	0.42	18.08	0.00	0.13	0.05
T6 CAIRP Class 4	Diesel	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 5	Diesel	0.00%	0.00	0.02	0.00	0.00	0.01	0.00
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 CAIRP Class 6	Diesel	0.00%	0.00	0.06	0.01	0.00	0.02	0.01
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 CAIRP Class 7	Diesel	0.03%	0.02	0.84	0.14	0.04	0.27	0.10
T6 CAIRP Class 7	Electricity	0.01%	0.00	0.00	0.00	0.00	0.05	0.02
T6 CAIRP Class 7	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Diesel	0.04%	0.03	1.20	0.21	0.06	0.37	0.14
T6 Instate Delivery Class 4	Electricity	0.05%	0.00	0.00	0.00	0.00	0.28	0.09
T6 Instate Delivery Class 4	Natural Gas	0.00%	0.00	0.00	0.09	0.00	0.00	0.00
T6 Instate Delivery Class 5	Diesel	0.04%	0.04	1.45	0.25	0.07	0.45	0.17
T6 Instate Delivery Class 5	Electricity	0.06%	0.00	0.00	0.00	0.00	0.34	0.11
T6 Instate Delivery Class 5	Natural Gas	0.00%	0.00	0.00	0.11	0.00	0.00	0.00
T6 Instate Delivery Class 6	Diesel	0.18%	0.14	5.87	1.01	0.28	1.79	0.66
T6 Instate Delivery Class 6	Electricity	0.24%	0.00	0.00	0.00	0.00	1.37	0.43
T6 Instate Delivery Class 6	Natural Gas	0.00%	0.00	0.01	0.42	0.00	0.01	0.00
T6 Instate Delivery Class 7	Diesel	0.07%	0.07	3.33	0.46	0.11	0.69	0.26

T6 Instate Delivery Class 7	Electricity	0.05%	0.00	0.00	0.00	0.00	0.31	0.10
T6 Instate Delivery Class 7	Natural Gas	0.00%	0.00	0.02	0.51	0.00	0.02	0.01
T6 Instate Other Class 4	Diesel	0.08%	0.07	2.64	0.46	0.13	0.83	0.31
T6 Instate Other Class 4	Electricity	0.11%	0.00	0.00	0.00	0.00	0.65	0.21
T6 Instate Other Class 4	Natural Gas	0.00%	0.00	0.01	0.19	0.00	0.01	0.00
T6 Instate Other Class 5	Diesel	0.22%	0.18	7.02	1.22	0.35	2.22	0.82
T6 Instate Other Class 5	Electricity	0.30%	0.00	0.00	0.00	0.00	1.75	0.55
T6 Instate Other Class 5	Natural Gas	0.00%	0.00	0.01	0.51	0.00	0.02	0.01
T6 Instate Other Class 6	Diesel	0.19%	0.15	6.12	1.05	0.30	1.90	0.70
T6 Instate Other Class 6	Electricity	0.26%	0.00	0.00	0.00	0.00	1.50	0.47
T6 Instate Other Class 6	Natural Gas	0.00%	0.00	0.01	0.44	0.00	0.01	0.00
T6 Instate Other Class 7	Diesel	0.15%	0.15	6.93	0.98	0.24	1.57	0.59
T6 Instate Other Class 7	Electricity	0.14%	0.00	0.00	0.00	0.00	0.81	0.26
T6 Instate Other Class 7	Natural Gas	0.00%	0.00	0.03	1.12	0.00	0.04	0.01
T6 Instate Tractor Class 6	Diesel	0.00%	0.00	0.07	0.01	0.00	0.02	0.01
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Diesel	0.16%	0.15	6.91	1.01	0.23	1.63	0.61
T6 Instate Tractor Class 7	Electricity	0.04%	0.00	0.00	0.00	0.00	0.25	0.08
T6 Instate Tractor Class 7	Natural Gas	0.00%	0.00	0.04	1.14	0.00	0.04	0.01
T6 OOS Class 4	Diesel	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 OOS Class 5	Diesel	0.00%	0.00	0.05	0.01	0.00	0.01	0.00
T6 OOS Class 6	Diesel	0.00%	0.00	0.12	0.02	0.00	0.03	0.01
T6 OOS Class 7	Diesel	0.02%	0.02	0.92	0.12	0.03	0.24	0.09
T6 Public Class 4	Diesel	0.00%	0.00	0.11	0.02	0.01	0.03	0.01
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00	0.02	0.01
T6 Public Class 4	Natural Gas	0.00%	0.00	0.00	0.17	0.00	0.01	0.00
T6 Public Class 5	Diesel	0.01%	0.01	0.27	0.04	0.01	0.07	0.03
T6 Public Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00	0.05	0.02
T6 Public Class 5	Natural Gas	0.00%	0.00	0.01	0.40	0.00	0.01	0.00
T6 Public Class 6	Diesel	0.01%	0.00	0.18	0.03	0.01	0.05	0.02
T6 Public Class 6	Electricity	0.01%	0.00	0.00	0.00	0.00	0.04	0.01
T6 Public Class 6	Natural Gas	0.00%	0.00	0.01	0.28	0.00	0.01	0.00
T6 Public Class 7	Diesel	0.02%	0.01	0.54	0.08	0.03	0.16	0.06
T6 Public Class 7	Electricity	0.02%	0.00	0.00	0.00	0.00	0.09	0.03
T6 Public Class 7	Natural Gas	0.00%	0.00	0.02	0.87	0.00	0.03	0.01
T6 Utility Class 5	Diesel	0.01%	0.00	0.14	0.03	0.01	0.06	0.02
T6 Utility Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00	0.06	0.02
T6 Utility Class 5	Natural Gas	0.00%	0.00	0.00	0.01	0.00	0.00	0.00
T6 Utility Class 6	Diesel	0.00%	0.00	0.03	0.00	0.00	0.01	0.00
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6 Utility Class 7	Diesel	0.00%	0.00	0.03	0.01	0.00	0.02	0.01
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00	0.01	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.00	0.00	0.00	0.00	0.00	0.00
T6TS	Gasoline	0.07%	0.09	0.68	1.66	0.16	0.64	0.22
T6TS	Electricity	0.09%	0.00	0.00	0.00	0.00	0.52	0.16
T7 CAIRP Class 8	Diesel	1.20%	2.25	234.80	7.54	2.51	30.76	13.60
T7 CAIRP Class 8	Electricity	0.35%	0.00	0.00	0.00	0.00	4.75	1.44
T7 CAIRP Class 8	Natural Gas	0.00%	0.01	0.12	2.18	0.00	0.09	0.03
T7 NNOOS Class 8	Diesel	1.85%	3.36	399.32	11.26	3.68	47.14	20.80
T7 NOOS Class 8	Diesel	0.67%	1.26	149.17	4.22	1.34	17.31	7.73
T7 POLA Class 8	Diesel	0.68%	1.18	130.61	4.19	1.51	17.00	7.31
T7 POLA Class 8	Electricity	0.14%	0.00	0.00	0.00	0.00	1.83	0.56
T7 POLA Class 8	Natural Gas	0.03%	0.06	0.72	14.06	0.00	0.58	0.19
T7 Public Class 8	Diesel	0.02%	0.05	4.02	0.17	0.04	0.41	0.17
T7 Public Class 8	Electricity	0.04%	0.00	0.00	0.00	0.00	0.56	0.17
T7 Public Class 8	Natural Gas	0.03%	0.07	0.91	17.56	0.00	0.66	0.22
T7 Single Concrete/Transit Mix	Diesel	0.03%	0.04	3.04	0.13	0.06	0.61	0.24
T7 Single Concrete/Transit Mix	Electricity	0.04%	0.00	0.00	0.00	0.00	0.53	0.16
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	0.00	0.05	1.06	0.00	0.04	0.01
T7 Single Dump Class 8	Diesel	0.05%	0.07	6.99	0.28	0.11	1.09	0.44
T7 Single Dump Class 8	Electricity	0.05%	0.00	0.00	0.00	0.00	0.69	0.21
T7 Single Dump Class 8	Natural Gas	0.00%	0.01	0.10	2.00	0.00	0.07	0.02

Year 2050 Current General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping

			CO ₂	CH ₄	N ₂ O	
			AR5 GWP	AR5 GWP	AR5 GWP	
Annual VMT		2,900,476,149	1	28	265	
Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
All Other Buses	Diesel	0.02%	535.16	0.00	0.08	557.51
All Other Buses	Natural Gas	0.01%	131.46	0.10	0.03	141.49
LDA	Gasoline	40.49%	264,966.76	1.16	3.70	265,980.95
LDA	Diesel	0.02%	123.30	0.00	0.02	128.45
LDA	Electricity	5.10%	0.00	0.00	0.00	0.00
LDA	Plug-in Hybrid	1.90%	6,249.54	0.02	0.02	6,256.39
LDT1	Gasoline	2.48%	18,654.20	0.08	0.23	18,718.18
LDT1	Diesel	0.00%	0.29	0.00	0.00	0.30
LDT1	Electricity	0.08%	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.06%	203.39	0.00	0.00	203.61
LDT2	Gasoline	21.01%	164,190.08	0.80	2.03	164,750.48
LDT2	Diesel	0.08%	586.05	0.00	0.09	610.56
LDT2	Electricity	0.59%	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.59%	1,925.97	0.01	0.01	1,928.03
LHD1	Gasoline	0.73%	10,247.70	0.01	0.03	10,256.80
LHD1	Diesel	0.48%	6,480.12	0.03	1.02	6,751.38
LHD1	Electricity	1.19%	0.00	0.00	0.00	0.00
LHD2	Gasoline	0.09%	1,379.73	0.00	0.01	1,381.29
LHD2	Diesel	0.23%	3,598.54	0.02	0.57	3,749.20
LHD2	Electricity	0.29%	0.00	0.00	0.00	0.00
MCY	Gasoline	0.25%	1,336.07	0.93	0.25	1,428.42
MDV	Gasoline	12.61%	119,175.71	0.49	1.24	119,519.17
MDV	Diesel	0.14%	1,299.57	0.00	0.20	1,353.84
MDV	Electricity	0.55%	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.38%	1,265.68	0.00	0.00	1,267.04
MH	Gasoline	0.03%	1,639.15	0.00	0.02	1,643.36
MH	Diesel	0.02%	528.07	0.00	0.08	550.14
Motor Coach	Diesel	0.01%	610.75	0.00	0.10	636.26
OBUS	Gasoline	0.01%	404.08	0.00	0.00	405.17
OBUS	Electricity	0.01%	0.00	0.00	0.00	0.00
PTO	Diesel	0.07%	3,570.77	0.00	0.56	3,719.89
PTO	Electricity	0.08%	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	208.41	0.00	0.00	209.13
SBUS	Diesel	0.00%	151.85	0.00	0.02	158.19
SBUS	Electricity	0.03%	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.01%	501.63	1.10	0.10	559.42
T6 CAIRP Class 4	Diesel	0.00%	17.12	0.00	0.00	17.83
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	23.49	0.00	0.00	24.48
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	61.30	0.00	0.01	63.86
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.03%	651.02	0.00	0.10	678.21
T6 CAIRP Class 7	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.36	0.00	0.00	0.38
T6 Instate Delivery Class 4	Diesel	0.04%	1,029.61	0.00	0.16	1,072.60
T6 Instate Delivery Class 4	Electricity	0.05%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	6.36	0.00	0.00	6.83
T6 Instate Delivery Class 5	Diesel	0.04%	1,250.09	0.00	0.20	1,302.29
T6 Instate Delivery Class 5	Electricity	0.06%	0.00	0.00	0.00	0.00

Year 2050 Current General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping

			CO ₂	CH ₄	N ₂ O	
			AR5 GWP	AR5 GWP	AR5 GWP	
Annual VMT	2,900,476,149		1	28	265	
Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
T6 Instate Delivery Class 5	Natural Gas	0.00%	7.68	0.01	0.00	8.24
T6 Instate Delivery Class 6	Diesel	0.18%	4,967.23	0.00	0.78	5,174.65
T6 Instate Delivery Class 6	Electricity	0.24%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	30.57	0.02	0.01	32.83
T6 Instate Delivery Class 7	Diesel	0.07%	1,907.91	0.00	0.30	1,987.58
T6 Instate Delivery Class 7	Electricity	0.05%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	35.79	0.02	0.01	38.40
T6 Instate Other Class 4	Diesel	0.08%	2,300.16	0.00	0.36	2,396.21
T6 Instate Other Class 4	Electricity	0.11%	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	14.22	0.01	0.00	15.27
T6 Instate Other Class 5	Diesel	0.22%	6,140.03	0.00	0.97	6,396.42
T6 Instate Other Class 5	Electricity	0.30%	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	37.79	0.03	0.01	40.58
T6 Instate Other Class 6	Diesel	0.19%	5,262.58	0.00	0.83	5,482.33
T6 Instate Other Class 6	Electricity	0.26%	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	32.39	0.02	0.01	34.79
T6 Instate Other Class 7	Diesel	0.15%	4,300.01	0.00	0.68	4,479.57
T6 Instate Other Class 7	Electricity	0.14%	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	81.31	0.06	0.02	87.26
T6 Instate Tractor Class 6	Diesel	0.00%	59.26	0.00	0.01	61.73
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.37	0.00	0.00	0.39
T6 Instate Tractor Class 7	Diesel	0.16%	4,037.05	0.00	0.64	4,205.63
T6 Instate Tractor Class 7	Electricity	0.04%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	80.48	0.06	0.02	86.41
T6 OOS Class 4	Diesel	0.00%	24.11	0.00	0.00	25.12
T6 OOS Class 5	Diesel	0.00%	33.09	0.00	0.01	34.47
T6 OOS Class 6	Diesel	0.00%	86.36	0.00	0.01	89.97
T6 OOS Class 7	Diesel	0.02%	565.49	0.00	0.09	589.11
T6 Public Class 4	Diesel	0.00%	91.46	0.00	0.01	95.28
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	13.42	0.01	0.00	14.41
T6 Public Class 5	Diesel	0.01%	197.84	0.00	0.03	206.10
T6 Public Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	30.48	0.02	0.01	32.70
T6 Public Class 6	Diesel	0.01%	147.44	0.00	0.02	153.59
T6 Public Class 6	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	22.13	0.02	0.00	23.75
T6 Public Class 7	Diesel	0.02%	457.99	0.00	0.07	477.12
T6 Public Class 7	Electricity	0.02%	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	68.56	0.05	0.01	73.60
T6 Utility Class 5	Diesel	0.01%	172.57	0.00	0.03	179.77
T6 Utility Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.77	0.00	0.00	0.82
T6 Utility Class 6	Diesel	0.00%	32.61	0.00	0.01	33.97
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.14	0.00	0.00	0.16
T6 Utility Class 7	Diesel	0.00%	44.96	0.00	0.01	46.83
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.20	0.00	0.00	0.21

Year 2050 Current General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping

		CO₂ CH₄ N₂O				
		AR5 GWP				
Annual VMT		2,900,476,149			1 28 265	
Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
T6TS	Gasoline	0.07%	2,650.48	0.00	0.01	2,653.78
T6TS	Electricity	0.09%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Diesel	1.20%	44,111.42	0.02	6.95	45,953.59
T7 CAIRP Class 8	Electricity	0.35%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	129.29	0.12	0.03	139.52
T7 NNOOS Class 8	Diesel	1.85%	64,836.00	0.03	10.21	67,543.68
T7 NOOS Class 8	Diesel	0.67%	23,537.14	0.01	3.71	24,520.11
T7 POLA Class 8	Diesel	0.68%	26,502.15	0.01	4.18	27,608.90
T7 POLA Class 8	Electricity	0.14%	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.03%	807.92	0.73	0.16	871.91
T7 Public Class 8	Diesel	0.02%	753.88	0.00	0.12	785.37
T7 Public Class 8	Electricity	0.04%	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.03%	971.34	0.84	0.20	1,047.29
T7 Single Concrete/Transit Mix	Diesel	0.03%	1,066.22	0.00	0.17	1,110.74
T7 Single Concrete/Transit Mix	Electricity	0.04%	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	61.62	0.05	0.01	66.46
T7 Single Dump Class 8	Diesel	0.05%	1,902.86	0.00	0.30	1,982.32
T7 Single Dump Class 8	Electricity	0.05%	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.00%	109.19	0.09	0.02	117.74
T7 Single Other Class 8	Diesel	0.26%	10,959.59	0.00	1.73	11,417.24
T7 Single Other Class 8	Electricity	0.33%	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.02%	631.25	0.55	0.13	680.80
T7 SWCV Class 8	Diesel	0.00%	150.39	0.00	0.02	156.67
T7 SWCV Class 8	Electricity	0.16%	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.18%	4,885.48	1.83	1.00	5,200.70
T7 Tractor Class 8	Diesel	1.06%	38,591.92	0.01	6.08	40,203.56
T7 Tractor Class 8	Electricity	0.23%	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.03%	862.14	0.77	0.18	930.31
T7 Utility Class 8	Diesel	0.01%	273.09	0.00	0.04	284.49
T7 Utility Class 8	Electricity	0.01%	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	10.72	0.00	0.00	10.91
T7IS	Electricity	0.00%	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.02%	260.46	0.00	0.00	260.89
UBUS	Electricity	0.10%	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.02%	258.31	0.00	0.05	272.29
total		100%	868,610.71	10.15	51.17	882,455.70

Year 2050 Proposed General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping

			CO ₂	CH ₄	N ₂ O	
			AR5 GWP	AR5 GWP	AR5 GWP	
Annual VMT		3,292,088,502	1	28	265	
Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
All Other Buses	Diesel	0.02%	607.42	0.00	0.10	632.78
All Other Buses	Natural Gas	0.01%	149.21	0.12	0.03	160.59
LDA	Gasoline	40.49%	300,741.67	1.32	4.20	301,892.79
LDA	Diesel	0.02%	139.95	0.00	0.02	145.80
LDA	Electricity	5.10%	0.00	0.00	0.00	0.00
LDA	Plug-in Hybrid	1.90%	7,093.33	0.02	0.03	7,101.10
LDT1	Gasoline	2.48%	21,172.83	0.09	0.26	21,245.45
LDT1	Diesel	0.00%	0.33	0.00	0.00	0.35
LDT1	Electricity	0.08%	0.00	0.00	0.00	0.00
LDT1	Plug-in Hybrid	0.06%	230.85	0.00	0.00	231.10
LDT2	Gasoline	21.01%	186,358.46	0.91	2.30	186,994.52
LDT2	Diesel	0.08%	665.18	0.00	0.10	692.99
LDT2	Electricity	0.59%	0.00	0.00	0.00	0.00
LDT2	Plug-in Hybrid	0.59%	2,186.00	0.01	0.01	2,188.34
LHD1	Gasoline	0.73%	11,631.31	0.01	0.04	11,641.63
LHD1	Diesel	0.48%	7,355.04	0.03	1.16	7,662.92
LHD1	Electricity	1.19%	0.00	0.00	0.00	0.00
LHD2	Gasoline	0.09%	1,566.02	0.00	0.01	1,567.79
LHD2	Diesel	0.23%	4,084.40	0.02	0.64	4,255.41
LHD2	Electricity	0.29%	0.00	0.00	0.00	0.00
MCY	Gasoline	0.25%	1,516.47	1.06	0.28	1,621.28
MDV	Gasoline	12.61%	135,266.41	0.56	1.41	135,656.24
MDV	Diesel	0.14%	1,475.03	0.00	0.23	1,536.64
MDV	Electricity	0.55%	0.00	0.00	0.00	0.00
MDV	Plug-in Hybrid	0.38%	1,436.57	0.00	0.01	1,438.11
MH	Gasoline	0.03%	1,860.46	0.00	0.02	1,865.25
MH	Diesel	0.02%	599.37	0.00	0.09	624.41
Motor Coach	Diesel	0.01%	693.21	0.00	0.11	722.16
OBUS	Gasoline	0.01%	458.64	0.00	0.00	459.88
OBUS	Electricity	0.01%	0.00	0.00	0.00	0.00
PTO	Diesel	0.07%	4,052.89	0.00	0.64	4,222.14
PTO	Electricity	0.08%	0.00	0.00	0.00	0.00
SBUS	Gasoline	0.01%	236.55	0.00	0.00	237.37
SBUS	Diesel	0.00%	172.35	0.00	0.03	179.55
SBUS	Electricity	0.03%	0.00	0.00	0.00	0.00
SBUS	Natural Gas	0.01%	569.35	1.24	0.12	634.95
T6 CAIRP Class 4	Diesel	0.00%	19.43	0.00	0.00	20.24
T6 CAIRP Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 5	Diesel	0.00%	26.67	0.00	0.00	27.78
T6 CAIRP Class 5	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 6	Diesel	0.00%	69.58	0.00	0.01	72.49
T6 CAIRP Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Diesel	0.03%	738.92	0.00	0.12	769.78
T6 CAIRP Class 7	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 CAIRP Class 7	Natural Gas	0.00%	0.40	0.00	0.00	0.43
T6 Instate Delivery Class 4	Diesel	0.04%	1,168.63	0.00	0.18	1,217.42
T6 Instate Delivery Class 4	Electricity	0.05%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 4	Natural Gas	0.00%	7.22	0.01	0.00	7.76
T6 Instate Delivery Class 5	Diesel	0.04%	1,418.88	0.00	0.22	1,478.13
T6 Instate Delivery Class 5	Electricity	0.06%	0.00	0.00	0.00	0.00

Year 2050 Proposed General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping

			CO ₂	CH ₄	N ₂ O	
			AR5 GWP	AR5 GWP	AR5 GWP	
Annual VMT	3,292,088,502		1	28	265	
Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
T6 Instate Delivery Class 5	Natural Gas	0.00%	8.71	0.01	0.00	9.36
T6 Instate Delivery Class 6	Diesel	0.18%	5,637.89	0.00	0.89	5,873.31
T6 Instate Delivery Class 6	Electricity	0.24%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 6	Natural Gas	0.00%	34.70	0.02	0.01	37.27
T6 Instate Delivery Class 7	Diesel	0.07%	2,165.51	0.00	0.34	2,255.94
T6 Instate Delivery Class 7	Electricity	0.05%	0.00	0.00	0.00	0.00
T6 Instate Delivery Class 7	Natural Gas	0.00%	40.62	0.03	0.01	43.58
T6 Instate Other Class 4	Diesel	0.08%	2,610.72	0.00	0.41	2,719.73
T6 Instate Other Class 4	Electricity	0.11%	0.00	0.00	0.00	0.00
T6 Instate Other Class 4	Natural Gas	0.00%	16.14	0.01	0.00	17.33
T6 Instate Other Class 5	Diesel	0.22%	6,969.04	0.00	1.10	7,260.04
T6 Instate Other Class 5	Electricity	0.30%	0.00	0.00	0.00	0.00
T6 Instate Other Class 5	Natural Gas	0.00%	42.89	0.03	0.01	46.06
T6 Instate Other Class 6	Diesel	0.19%	5,973.11	0.00	0.94	6,222.53
T6 Instate Other Class 6	Electricity	0.26%	0.00	0.00	0.00	0.00
T6 Instate Other Class 6	Natural Gas	0.00%	36.77	0.03	0.01	39.48
T6 Instate Other Class 7	Diesel	0.15%	4,880.58	0.00	0.77	5,084.38
T6 Instate Other Class 7	Electricity	0.14%	0.00	0.00	0.00	0.00
T6 Instate Other Class 7	Natural Gas	0.00%	92.29	0.06	0.02	99.04
T6 Instate Tractor Class 6	Diesel	0.00%	67.26	0.00	0.01	70.06
T6 Instate Tractor Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 6	Natural Gas	0.00%	0.42	0.00	0.00	0.45
T6 Instate Tractor Class 7	Diesel	0.16%	4,582.12	0.00	0.72	4,773.46
T6 Instate Tractor Class 7	Electricity	0.04%	0.00	0.00	0.00	0.00
T6 Instate Tractor Class 7	Natural Gas	0.00%	91.35	0.06	0.02	98.08
T6 OOS Class 4	Diesel	0.00%	27.37	0.00	0.00	28.51
T6 OOS Class 5	Diesel	0.00%	37.56	0.00	0.01	39.13
T6 OOS Class 6	Diesel	0.00%	98.02	0.00	0.02	102.12
T6 OOS Class 7	Diesel	0.02%	641.85	0.00	0.10	668.65
T6 Public Class 4	Diesel	0.00%	103.81	0.00	0.02	108.14
T6 Public Class 4	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Public Class 4	Natural Gas	0.00%	15.24	0.01	0.00	16.35
T6 Public Class 5	Diesel	0.01%	224.55	0.00	0.04	233.93
T6 Public Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 Public Class 5	Natural Gas	0.00%	34.59	0.02	0.01	37.12
T6 Public Class 6	Diesel	0.01%	167.34	0.00	0.03	174.33
T6 Public Class 6	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 Public Class 6	Natural Gas	0.00%	25.11	0.02	0.01	26.96
T6 Public Class 7	Diesel	0.02%	519.83	0.00	0.08	541.53
T6 Public Class 7	Electricity	0.02%	0.00	0.00	0.00	0.00
T6 Public Class 7	Natural Gas	0.00%	77.82	0.05	0.02	83.54
T6 Utility Class 5	Diesel	0.01%	195.87	0.00	0.03	204.05
T6 Utility Class 5	Electricity	0.01%	0.00	0.00	0.00	0.00
T6 Utility Class 5	Natural Gas	0.00%	0.87	0.00	0.00	0.93
T6 Utility Class 6	Diesel	0.00%	37.02	0.00	0.01	38.56
T6 Utility Class 6	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 6	Natural Gas	0.00%	0.16	0.00	0.00	0.18
T6 Utility Class 7	Diesel	0.00%	51.03	0.00	0.01	53.16
T6 Utility Class 7	Electricity	0.00%	0.00	0.00	0.00	0.00
T6 Utility Class 7	Natural Gas	0.00%	0.23	0.00	0.00	0.24

Year 2050 Proposed General Plan: Greenhouse Gas Emissions

Source: EMFAC2021 Version 1.0.2 web database. Emission Rates. San Bernardino (SC) Sub-Area.

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 2008 Climate Change Scoping

			CO ₂	CH ₄	N ₂ O	
			AR5 GWP	AR5 GWP	AR5 GWP	
Annual VMT	3,292,088,502		1	28	265	

Vehicle Type	Fuel Type	Percent of VMT	CO ₂	CH ₄	N ₂ O	CO ₂ e
T6TS	Gasoline	0.07%	3,008.34	0.00	0.01	3,012.08
T6TS	Electricity	0.09%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Diesel	1.20%	50,067.19	0.02	7.89	52,158.09
T7 CAIRP Class 8	Electricity	0.35%	0.00	0.00	0.00	0.00
T7 CAIRP Class 8	Natural Gas	0.00%	146.74	0.13	0.03	158.35
T7 NNOOS Class 8	Diesel	1.85%	73,589.93	0.03	11.59	76,663.20
T7 NOOS Class 8	Diesel	0.67%	26,715.05	0.01	4.21	27,830.73
T7 POLA Class 8	Diesel	0.68%	30,080.38	0.01	4.74	31,336.56
T7 POLA Class 8	Electricity	0.14%	0.00	0.00	0.00	0.00
T7 POLA Class 8	Natural Gas	0.03%	917.00	0.82	0.19	989.63
T7 Public Class 8	Diesel	0.02%	855.67	0.00	0.13	891.40
T7 Public Class 8	Electricity	0.04%	0.00	0.00	0.00	0.00
T7 Public Class 8	Natural Gas	0.03%	1,102.48	0.95	0.22	1,188.69
T7 Single Concrete/Transit Mix	Diesel	0.03%	1,210.18	0.00	0.19	1,260.71
T7 Single Concrete/Transit Mix	Electricity	0.04%	0.00	0.00	0.00	0.00
T7 Single Concrete/Transit Mix	Natural Gas	0.00%	69.94	0.06	0.01	75.43
T7 Single Dump Class 8	Diesel	0.05%	2,159.78	0.00	0.34	2,249.97
T7 Single Dump Class 8	Electricity	0.05%	0.00	0.00	0.00	0.00
T7 Single Dump Class 8	Natural Gas	0.00%	123.93	0.11	0.03	133.63
T7 Single Other Class 8	Diesel	0.26%	12,439.31	0.00	1.96	12,958.76
T7 Single Other Class 8	Electricity	0.33%	0.00	0.00	0.00	0.00
T7 Single Other Class 8	Natural Gas	0.02%	716.48	0.63	0.15	772.72
T7 SWCV Class 8	Diesel	0.00%	170.69	0.00	0.03	177.82
T7 SWCV Class 8	Electricity	0.16%	0.00	0.00	0.00	0.00
T7 SWCV Class 8	Natural Gas	0.18%	5,545.10	2.08	1.13	5,902.88
T7 Tractor Class 8	Diesel	1.06%	43,802.47	0.02	6.90	45,631.70
T7 Tractor Class 8	Electricity	0.23%	0.00	0.00	0.00	0.00
T7 Tractor Class 8	Natural Gas	0.03%	978.54	0.88	0.20	1,055.92
T7 Utility Class 8	Diesel	0.01%	309.96	0.00	0.05	322.90
T7 Utility Class 8	Electricity	0.01%	0.00	0.00	0.00	0.00
T7IS	Gasoline	0.00%	12.17	0.00	0.00	12.38
T7IS	Electricity	0.00%	0.00	0.00	0.00	0.00
UBUS	Gasoline	0.02%	295.63	0.00	0.00	296.11
UBUS	Electricity	0.10%	0.00	0.00	0.00	0.00
UBUS	Natural Gas	0.02%	293.18	0.00	0.06	309.05
total		100%	985,887.55	11.53	58.08	1,001,601.85

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Operation-Related Annual Vehicle Fuel/Energy Usage Summary

Existing - Baseline Year 2025													
Year	VTMT	Gas Gallons	Miles/Gal	VTMT	Diesel Gallons	Miles/Gal	VTMT	CNG Gallons	Miles/Gal	VTMT	Electricity kWh	Miles/kWh	
Existing Baseline	2,399,271,002	93,036,281	25.79	212,496,647	26,758,311	7.94	14,447,971	2,453,078	5.89	112,348,677	42,558,735	2.64	
Existing - Year 2050													
Year	VTMT	Gas Gallons	Miles/Gal	VTMT	Diesel Gallons	Miles/Gal	VTMT	CNG Gallons	Miles/Gal	VTMT	Electricity kWh	Miles/kWh	
Existing Year 2050	2,162,893,953	67,087,981	32.24	222,805,778	26,024,125	8.56	9,866,132	1,330,458	7.42	342,998,434	221,705,730	1.55	
Proposed Project (GP 2050)													
Year	VTMT	Gas Gallons	Miles/Gal	VTMT	Diesel Gallons	Miles/Gal	VTMT	CNG Gallons	Miles/Gal	VTMT	Electricity kWh	Miles/kWh	
Proposed Project	2,600,062,493	80,647,940	32.24	267,839,737	31,284,175	8.56	11,860,294	1,599,373	7.42	412,325,978	266,517,345	1.55	
Net Change													
Year	VTMT	Gas Gallons	Miles/Gal	VTMT	Diesel Gallons	Miles/Gal	VTMT	CNG Gallons	Miles/Gal	VTMT	Electricity kWh	Miles/kWh	
From Existing Baseline	200,791,492	-12,388,341	6.45	55,343,089	4,525,864	0.62	-2,587,677	-853,705	1.53	299,977,301	223,958,610	-1.09	
From Existing 2050	437,168,540	13,559,960	0.00	45,033,959	5,260,049	0.00	1,994,163	268,915	0.00	69,327,544	44,811,615	0.00	

Notes

* VMT based on VMT data provided by KOA, 2025.

** Fuel consumption rates based on data obtained from EMFAC2021 Web Database, Version 1.0.2. San Bernardino (SC) Sub-Area.

****VMT per year based on a conversion of VMT x 347 days per year to account for less travel on weekend, consistent with CARB statewide GHG emissions inventory methodology. California Air Resources Board. 2008, October. Climate Change Proposed Scoping Plan: A Framework for Change.

Existing Baseline Year 2025: VMT

Vehicle type	Fleet percent	VMT
LDA	52.06%	1,425,706,163
LDT1	3.32%	90,922,587
LDT2	19.85%	543,558,778
MDV	14.38%	393,737,313
LHD1	2.57%	70,304,285
LHD2	0.69%	18,902,773
MHD	1.79%	49,069,768
HHD	4.60%	126,075,327
OBUS	0.04%	990,602
UBUS	0.10%	2,622,308
MCY	0.29%	8,040,899
SBUS	0.08%	2,084,769
MH	0.10%	2,634,160
All Other Buses	0.03%	730,646
Motor Coach	0.01%	398,208
PTO	0.10%	2,785,712
	100.00%	2,738,564,297

Vehicle type	Gas percent	Diesel percent	CNG percent	Electricity percent
LDA	93.09%	0.16%	0.00%	6.76%
LDT1	99.55%	0.01%	0.00%	0.44%
LDT2	98.38%	0.30%	0.00%	1.32%
MDV	97.12%	1.27%	0.00%	1.62%
LHD1	58.77%	40.29%	0.00%	0.94%
LHD2	34.44%	64.71%	0.00%	0.85%
MHD	10.21%	87.55%	1.32%	0.92%
HHD	0.01%	90.90%	8.53%	0.56%
OBUS	46.26%	46.83%	6.43%	0.48%
UBUS	13.09%	1.11%	83.00%	2.80%
MCY	100.00%	0.00%	0.00%	0.00%
SBUS	44.19%	23.43%	31.97%	0.41%
MH	70.62%	29.38%	0.00%	0.00%
All Other Buses	0.00%	81.34%	18.66%	0.00%
Motor Coach	0.00%	100.00%	0.00%	0.00%
PTO	0.00%	98.68%	0.00%	1.32%

<< Equal to T6 (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

<< Equal to T7 (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

<< OBUS (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

Vehicle type	Gasoline			Diesel			CNG			Electricity		
	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	m/kWh	kWh
LDA	1,327,121,692	30.35	43,724,937	2,271,239	43.35	52,399	0	0.00	0	96,313,231	2.73	35,227,403
LDT1	90,509,750	25.00	3,619,989	9,058	24.31	373	0	0.00	0	403,780	2.80	144,042
LDT2	534,776,325	24.89	21,489,058	1,622,641	33.94	47,809	0	0.00	0	7,159,811	2.89	2,481,389
MDV	382,389,414	20.17	18,962,707	4,981,474	24.24	205,526	0	0.00	0	6,366,424	2.80	2,273,548
LHD1	41,316,201	13.94	2,964,515	28,326,025	20.66	1,370,945	0	0.00	0	662,059	1.78	371,097
LHD2	6,511,026	12.25	531,525	12,231,195	17.31	706,699	0	0.00	0	160,553	1.78	90,068
MHD	5,011,104	5.27	951,307	42,961,341	9.00	4,775,999	645,423	8.66	74,544	451,900	0.96	473,102
HHD	11,559	3.98	2,908	114,596,839	6.10	18,775,187	10,759,638	6.34	1,697,944	707,290	0.56	1,263,210
OBUS	458,205	5.16	88,849	463,884	0.00	0	63,725	0.00	0	4,788	0.95	5,028
UBUS	343,371	12.95	26,517	29,186	10.33	2,825	2,176,406	4.26	510,414	73,345	0.51	143,499
MCY	8,040,899	42.15	190,790	0	10.33	0	0	4.26	0	0	0.00	0
SBUS	921,247	8.99	102,475	488,458	7.38	66,177	666,435	4.30	154,853	8,629	0.86	9,977
MH	1,860,208	4.89	380,705	773,952	10.22	75,697	0	0.00	0	0	0.00	0
All Other Buses	0	0	0	594,302	9.54	62,264	136,344	8.90	15,323	0	0.00	0
Motor Coach	0	0	0	398,208	5.63	70,736	0	0.00	0	0	0.00	0
PTO	0	0	0	2,748,845	5.04	545,677	0	0.00	0	36,866	0.48	76,370
	2,399,271,002		93,036,281	212,496,647		26,758,311	14,447,971		2,453,078	112,348,677		42,558,735

Existing Year 2050: VMT

Vehicle type	Fleet percent	VMT
LDA	47.51%	1,301,186,393
LDT1	2.62%	71,708,309
LDT2	22.27%	609,797,805
MDV	13.69%	374,802,006
LHD1	2.41%	65,866,552
LHD2	0.61%	16,670,301
MHD	2.72%	74,480,787
HHD	7.47%	204,651,473
OBUS	0.02%	636,336
UBUS	0.14%	3,714,833
MCY	0.25%	6,891,646
SBUS	0.05%	1,439,077
MH	0.05%	1,376,747
All Other Buses	0.03%	698,476
Motor Coach	0.01%	386,279
PTO	0.16%	4,257,278
	100.00%	2,738,564,297

Vehicle type	Gas percent	Diesel percent	CNG percent	Electricity percent
LDA	86.85%	0.05%	0.00%	13.10%
LDT1	95.58%	0.00%	0.00%	4.42%
LDT2	95.42%	0.36%	0.00%	4.22%
MDV	93.30%	1.00%	0.00%	5.70%
LHD1	30.28%	20.16%	0.00%	49.56%
LHD2	14.27%	37.84%	0.00%	47.89%
MHD	2.43%	44.91%	0.77%	51.89%
HHD	0.00%	77.86%	4.05%	18.09%
OBUS	15.60%	53.58%	9.44%	21.38%
UBUS	12.25%	0.00%	11.90%	75.85%
MCY	100.00%	0.00%	0.00%	0.00%
SBUS	17.44%	8.92%	22.98%	50.66%
MH	63.89%	36.11%	0.00%	0.00%
All Other Buses	0.00%	76.73%	23.27%	0.00%
Motor Coach	0.00%	100.00%	0.00%	0.00%
PTO	0.00%	46.24%	0.00%	53.76%

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<<OBUS (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

Vehicle type	Gasoline			Diesel			CNG			Electricity		
	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	mpg	Gallons	VMT	m/kWh	kWh
LDA	1,130,079,035	36.98	30,558,258	640,665	55.89	11,464	0	0.00	0	170,466,693	2.70	63,223,739
LDT1	68,538,508	32.15	2,131,533	812	29.87	27	0	0.00	0	3,168,988	2.78	1,139,015
LDT2	581,865,765	30.99	18,773,062	2,200,741	40.39	54,487	0	0.00	0	25,731,299	2.82	9,135,716
MDV	349,694,914	25.69	13,611,859	3,740,067	30.95	120,823	0	0.00	0	21,367,024	2.77	7,724,743
LHD1	19,943,963	17.27	1,154,744	13,276,823	21.88	606,927	0	0.00	0	32,645,765	1.79	18,275,680
LHD2	2,378,561	15.32	155,297	6,308,713	18.65	338,248	0	0.00	0	7,983,028	1.78	4,475,136
MHD	1,810,498	6.12	295,848	33,447,586	10.16	3,291,593	572,243	8.84	64,710	38,650,461	0.96	40,399,216
HHD	6,298	5.33	1,182	159,332,980	7.55	21,094,661	8,298,320	7.22	1,149,266	37,013,875	0.56	66,087,701
OBUS	99,240	5.94	16,696	340,970	0.00	0	60,095	0.00	0	136,032	0.95	142,863
UBUS	454,958	15.87	28,659	0	0.00	0	442,240	14.23	31,074	2,817,635	0.51	5,518,123
MCY	6,891,646	44.06	156,413	0	0.00	0	0	0.00	0	0	0.00	0
SBUS	250,982	10.24	24,507	128,298	8.42	15,234	330,697	4.78	69,136	729,100	0.86	843,059
MH	879,586	4.89	179,923	497,161	10.13	49,096	0	0.00	0	0	0.00	0
All Other Buses	0	0	0	535,939	10.65	50,302	162,537	10	16,272	0	0.00	0
Motor Coach	0	0	0	386,279	6.52	59,282	0	0	0	0	0.00	0
PTO	0	0	0	1,968,745	5.93	331,983	0	0	0	2,288,533	0.48	4,740,739
	2,162,893,953		67,087,981	222,805,778		26,024,125	9,866,132		1,330,458	342,998,434		221,705,730

Proposed Project Year 2050 (General Plan 2050): VMT

Vehicle type	Fleet percent	VMT
LDA	47.51%	1,564,184,843
LDT1	2.62%	86,202,139
LDT2	22.27%	733,051,382
MDV	13.69%	450,557,752
LHD1	2.41%	79,179,634
LHD2	0.61%	20,039,736
MHD	2.72%	89,534,996
HHD	7.47%	246,016,047
OBUS	0.02%	764,954
UBUS	0.14%	4,465,683
MCY	0.25%	8,284,599
SBUS	0.05%	1,729,946
MH	0.05%	1,655,018
All Other Buses	0.03%	839,653
Motor Coach	0.01%	464,354
PTO	0.16%	5,117,768
	100.00%	3,292,088,502

Vehicle type	Gas percent	Diesel percent	CNG percent	Electricity percent
LDA	86.85%	0.05%	0.00%	13.10%
LDT1	95.58%	0.00%	0.00%	4.42%
LDT2	95.42%	0.36%	0.00%	4.22%
MDV	93.30%	1.00%	0.00%	5.70%
LHD1	30.28%	20.16%	0.00%	49.56%
LHD2	14.27%	37.84%	0.00%	47.89%
MHD	2.43%	44.91%	0.77%	51.89%
HHD	0.00%	77.86%	4.05%	18.09%
OBUS	15.60%	53.58%	9.44%	21.38%
UBUS	12.25%	0.00%	11.90%	75.85%
MCY	100.00%	0.00%	0.00%	0.00%
SBUS	17.44%	8.92%	22.98%	50.66%
MH	63.89%	36.11%	0.00%	0.00%
All Other Buses	0.00%	76.73%	23.27%	0.00%
Motor Coach	0.00%	100.00%	0.00%	0.00%
PTO	0.00%	46.24%	0.00%	53.76%

<< Equal to T6 (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

<< Equal to T7 (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

<< OBUS (<https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf>)

Vehicle type	VMT	Gasoline mpg	Gallons	VMT	Diesel mpg	Gallons	VMT	CNG mpg	Gallons	VMT	Electricity m/kWh	kWh
LDA	1,358,492,916	36.98	36,734,756	770,157	55.89	13,781	0	0.00	0	204,921,769	2.70	76,002,650
LDT1	82,391,652	32.15	2,562,363	977	29.87	33	0	0.00	0	3,809,511	2.78	1,369,235
LDT2	699,473,661	30.99	22,567,511	2,645,559	40.39	65,500	0	0.00	0	30,932,162	2.82	10,982,245
MDV	420,375,964	25.69	16,363,115	4,496,017	30.95	145,245	0	0.00	0	25,685,771	2.77	9,286,084
LHD1	23,975,078	17.27	1,388,143	15,960,362	21.88	729,600	0	0.00	0	39,244,194	1.79	21,969,597
LHD2	2,859,320	15.32	186,685	7,583,842	18.65	406,615	0	0.00	0	9,596,574	1.78	5,379,660
MHD	2,176,439	6.12	355,645	40,208,080	10.16	3,956,896	687,906	8.84	77,789	46,462,571	0.96	48,564,788
HHD	7,571	5.33	1,421	191,537,687	7.55	25,358,356	9,975,593	7.22	1,381,558	44,495,195	0.56	79,445,482
OBUS	119,298	5.94	20,071	409,887	0.00	0	72,241	0.00	0	163,527	0.95	171,739
UBUS	546,915	15.87	34,452	0	0.00	0	531,626	14.23	37,355	3,387,141	0.51	6,633,457
MCY	8,284,599	44.06	188,028	0	0.00	0	0	14.23	0	0	0.00	0
SBUS	301,710	10.24	29,460	154,230	8.42	18,313	397,539	4.78	83,110	876,467	0.86	1,013,460
MH	1,057,369	4.89	216,290	597,648	10.13	59,019	0	0.00	0	0	0.00	0
All Other Buses	0	0	0	644,264	10.65	60,469	195,389	9.99	19,561	0	0.00	0
Motor Coach	0	0	0	464,354	6.52	71,264	0	0.00	0	0	0.00	0
PTO	0	0	0	2,366,672	5.93	399,084	0	0.00	0	2,751,096	0.48	5,698,947
	2,600,062,493		80,647,940	267,839,737		31,284,175	11,860,294		1,599,373	412,325,978		266,517,345

EMFAC Fuel Usage: Year 2025

Vehicle type	GAS			DSL			NG			ELEC		
	VMT/day	Gallons/day	Miles/gallon	VMT/day	Gallons/day	Miles/gallon	VMT/day	Gallons/day	Miles/gallon	VMT/day	kWh/day	Miles/kWh
All other buses	0	0	0.00	9,112	955	9.54	2,090	235	8.90	0	0	0.00
LDA	20,347,036	670,378	30.35	34,822	803	43.35	0	0	0.00	1,476,646	540,096	2.73
LDT1	1,387,669	55,501	25.00	139	6	24.31	0	0	0.00	6,191	2,208	2.80
LDT2	8,199,032	329,464	24.89	24,878	733	33.94	0	0	0.00	109,772	38,044	2.89
LHD1	633,448	45,451	13.94	434,286	21,019	20.66	0	0	0.00	10,150	5,690	1.78
LHD2	99,825	8,149	12.25	187,525	10,835	17.31	0	0	0.00	2,462	1,381	1.78
MCY	123,281	2,925	42.15	0	0	0.00	0	0	0.00	0	0	0.00
MDV	5,862,681	290,731	20.17	76,374	3,151	24.24	0	0	0.00	97,608	34,857	2.80
MH	28,520	5,837	4.89	11,866	1,161	10.22	0	0	0.00	0	0	0.00
Motor coach	0	0	0.00	6,105	1,085	5.63	0	0	0.00	0	0	0.00
OBUS	15,031	2,915	5.16	0	0	0.00	0	0	0.00	157	165	0.95
PTO	0	0	0.00	42,144	8,366	5.04	0	0	0.00	565	1,171	0.48
SBUS	14,124	1,571	8.99	7,489	1,015	7.38	10,218	2,374	4.30	132	153	0.86
T6	76,829	14,585	5.27	658,671	73,224	9.00	9,895	1,143	8.66	6,928	7,253	0.96
T7	177	45	3.98	1,756,965	287,856	6.10	164,964	26,032	6.34	10,844	19,367	0.56
UBUS	5,264	407	12.95	447	43	10.33	33,368	7,826	4.26	1,125	2,200	0.51
Total	36,792,917	1,427,957	25.77	3,250,823	410,250	7.92	220,535	37,610	5.86	1,722,580	652,586	2.64

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: Sub-Area

Region: San Bernardino (SC)

Calendar Year: 2025, 2050

Season: Annual

Vehicle Classification: EMFAC202X Categories

Units: miles/day for Combustion VMT and Electric VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption, kWh/day for Energy Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Fuel Consumption	Energy Consumption
San Bernardino (	2025	All Other Buses	Aggregate	Aggregate	Diesel	169.8041533	9111.666348	9111.666348	0	1511.25696	0.954608057	0
San Bernardino (	2025	All Other Buses	Aggregate	Aggregate	Natural Gas	34.88313202	2090.378559	2090.378559	0	310.459875	0.234933258	0
San Bernardino (	2025	LDA	Aggregate	Aggregate	Gasoline	457374.7047	20012363.19	20012363.19	0	2124445.41	659.2303928	0
San Bernardino (	2025	LDA	Aggregate	Aggregate	Diesel	986.5858319	34821.96021	34821.96021	0	4226.27462	0.803361461	0
San Bernardino (	2025	LDA	Aggregate	Aggregate	Electricity	22921.29943	1119595.112	0	1119595	114790.15	0	432256.1185
San Bernardino (	2025	LDA	Aggregate	Aggregate	Plug-in Hybrid	13621.71468	691723.9558	334673.1571	357050.8	56325.7902	11.14738256	107839.983
San Bernardino (	2025	LDT1	Aggregate	Aggregate	Gasoline	39862.49619	1386010.237	1386010.237	0	172343.791	55.44488475	0
San Bernardino (	2025	LDT1	Aggregate	Aggregate	Diesel	9.62153332	138.8700264	138.8700264	0	27.0666175	0.005712258	0
San Bernardino (	2025	LDT1	Aggregate	Aggregate	Electricity	81.74409231	4029.090974	0	4029.091	409.6554	0	1555.561655
San Bernardino (	2025	LDT1	Aggregate	Aggregate	Plug-in Hybrid	75.22656194	3819.958249	1658.418308	2161.54	311.061834	0.055707597	652.8494865
San Bernardino (	2025	LDT2	Aggregate	Aggregate	Gasoline	197589.8024	8156000.659	8156000.659	0	925465.374	328.0141754	0
San Bernardino (	2025	LDT2	Aggregate	Aggregate	Diesel	559.2848358	24877.85405	24877.85405	0	2707.61189	0.732985994	0
San Bernardino (	2025	LDT2	Aggregate	Aggregate	Electricity	1637.444663	58171.59292	0	58171.59	8336.72928	0	22459.03603
San Bernardino (	2025	LDT2	Aggregate	Aggregate	Plug-in Hybrid	1934.989022	94631.92591	43031.41867	51600.51	8001.17961	1.449689627	15584.89113
San Bernardino (	2025	LHD1	Aggregate	Aggregate	Gasoline	16963.11371	633447.7463	633447.7463	0	252725.119	45.45107153	0
San Bernardino (	2025	LHD1	Aggregate	Aggregate	Diesel	11403.02981	434286.2222	434286.2222	0	143435.77	21.01892267	0
San Bernardino (	2025	LHD1	Aggregate	Aggregate	Electricity	147.3648902	10150.48537	0	10150.49	2061.84386	0	5689.551696
San Bernardino (	2025	LHD2	Aggregate	Aggregate	Gasoline	2823.949841	99825.11713	99825.11713	0	42072.6449	8.149183621	0
San Bernardino (	2025	LHD2	Aggregate	Aggregate	Diesel	4888.887446	187525.0486	187525.0486	0	61496.0539	10.83489203	0
San Bernardino (	2025	LHD2	Aggregate	Aggregate	Electricity	37.58571717	2461.549606	0	2461.55	498.422545	0	1380.892536
San Bernardino (	2025	MCY	Aggregate	Aggregate	Gasoline	20826.96994	123280.6812	123280.6812	0	41653.9399	2.925130919	0
San Bernardino (	2025	MDV	Aggregate	Aggregate	Gasoline	147056.3511	5833561.643	5833561.643	0	672637.607	289.7409456	0
San Bernardino (	2025	MDV	Aggregate	Aggregate	Diesel	1906.902909	76374.47974	76374.47974	0	8796.88542	3.151065928	0
San Bernardino (	2025	MDV	Aggregate	Aggregate	Electricity	1802.834782	63969.43971	0	63969.44	9175.3562	0	24697.48341
San Bernardino (	2025	MDV	Aggregate	Aggregate	Plug-in Hybrid	1256.812117	62758.18504	29119.49413	33638.69	5196.9181	0.98965379	10159.88725
San Bernardino (	2025	MH	Aggregate	Aggregate	Gasoline	3227.585522	28520.15334	28520.15334	0	322.887656	5.836852659	0
San Bernardino (	2025	MH	Aggregate	Aggregate	Diesel	1329.243498	11866.0087	11866.0087	0	132.92435	1.160560036	0
San Bernardino (	2025	Motor Coach	Aggregate	Aggregate	Diesel	45.66627183	6105.206394	6105.206394	0	1049.41093	1.084503348	0
San Bernardino (	2025	OBUS	Aggregate	Aggregate	Gasoline	358.2884481	15030.55432	15030.55432	0	7168.63527	2.914537526	0
San Bernardino (	2025	OBUS	Aggregate	Aggregate	Electricity	1.990200949	157.0570869	0	157.0571	39.8199406	0	164.9376395
San Bernardino (	2025	PTO	Aggregate	Aggregate	Diesel	0	42144.48035	42144.48035	0	0	8.366154299	0
San Bernardino (	2025	PTO	Aggregate	Aggregate	Electricity	0	565.2262214	0	565.2262	0	0	1170.876726
San Bernardino (	2025	SBUS	Aggregate	Aggregate	Gasoline	300.4577721	14124.28621	14124.28621	0	1201.83109	1.57111818	0
San Bernardino (	2025	SBUS	Aggregate	Aggregate	Diesel	363.8707141	7488.892183	7488.892183	0	5268.84794	1.014599014	0
San Bernardino (	2025	SBUS	Aggregate	Aggregate	Electricity	4.690534617	132.2929048	0	132.2929	57.7594012	0	152.9704635
San Bernardino (	2025	SBUS	Aggregate	Aggregate	Natural Gas	411.4766102	10217.59148	10217.59148	0	5958.18132	2.374159413	0
San Bernardino (	2025	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	5.752843824	385.7442435	385.7442435	0	132.200351	0.041584909	0
San Bernardino (	2025	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	0.072984666	5.994061806	0	5.994062	1.67718763	0	6.298979749
San Bernardino (	2025	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	7.611482927	530.0551207	530.0551207	0	174.911878	0.057177766	0
San Bernardino (	2025	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	0.084490841	7.339390339	0	7.33939	1.94159953	0	7.712745149
San Bernardino (	2025	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	25.82531113	1375.68847	1375.68847	0	593.46565	0.146081783	0
San Bernardino (	2025	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	0.475347025	28.53876256	0	28.53876	10.9234746	0	29.99052951
San Bernardino (	2025	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	42.59528096	8714.394185	8714.394185	0	978.839557	0.860981303	0
San Bernardino (	2025	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	0.405349924	86.39592131	0	86.39592	9.31494125	0	90.79088211
San Bernardino (	2025	T6 CAIRP Class 7	Aggregate	Aggregate	Natural Gas	0.036735693	7.232866529	7.232866529	0	0.84418624	0.000706302	0
San Bernardino (	2025	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	638.2523506	21673.46805	21673.46805	0	9107.86104	2.434187906	0
San Bernardino (	2025	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	5.256724137	213.0091649	0	213.0092	75.0134534	0	222.8784994
San Bernardino (	2025	T6 Instate Delivery Class 4	Aggregate	Aggregate	Natural Gas	2.390694959	85.33335851	85.33335851	0	34.1152171	0.009988193	0
San Bernardino (	2025	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	767.95228	26354.86236	26354.86236	0	10958.679	3.000197562	0
San Bernardino (	2025	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	5.940372881	239.57782	0	239.5778	84.769121	0	250.6781577
San Bernardino (	2025	T6 Instate Delivery Class 5	Aggregate	Aggregate	Natural Gas	2.285409224	82.82724144	82.82724144	0	32.6127896	0.009562376	0
San Bernardino (	2025	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	3069.45604	104668.5715	104668.5715	0	43801.1377	11.77643673	0
San Bernardino (	2025	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	24.20451995	960.5608775	0	960.5609	345.3985	0	1005.066458
San Bernardino (	2025	T6 Instate Delivery Class 6	Aggregate	Aggregate	Natural Gas	10.29800832	365.8073963	365.8073963	0	146.952579	0.042392013	0
San Bernardino (	2025	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	554.0890462	30329.81131	30329.81131	0	7906.85069	3.319032164	0
San Bernardino (	2025	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	3.025073417	145.1989436	0	145.1989	43.1677977	0	151.9264332
San Bernardino (	2025	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	14.65614514	806.2702616	806.2702616	0	209.143191	0.091250236	0
San Bernardino (	2025	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1181.982606	49337.29822	49337.29822	0	13663.7189	5.546587286	0
San Bernardino (	2025	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	10.80643549	502.458197	0	502.4582	124.922394	0	525.7324659
San Bernardino (	2025	T6 Instate Other Class 4	Aggregate	Aggregate	Natural Gas	4.251168467	185.9966983	185.9966983	0	49.1435075	0.02169663	0
San Bernardino (	2025	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	3036.823363	132038.3795	132038.3795	0	35105.6781	14.9228447	0
San Bernardino (	2025	T6 Instate Other Class 5	Aggregate	Aggregate	Electricity	23.34157551	1095.669054	0	1095.669	269.828613	0	1146.421328
San Bernardino (	2025	T6 Instate Other Class 5	Aggregate	Aggregate	Natural Gas	9.358900753	415.3357921	415.3357921	0	108.188893	0.047458945	0
San Bernardino (	2025	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	2641.085825	113011.2349	113011.2349	0	30530.9521	12.67504089	0
San Bernardino (	2025	T6 Instate Other Class 6	Aggregate	Aggregate	Electricity	22.4199058	1030.650345	0	1030.65	259.174111	0	1078.3909
San Bernardino (	2025	T6 Instate Other Class 6	Aggregate	Aggregate	Natural Gas	8.099198405	354.4718026	354.4718026	0	93.6267336	0.040573241	0
San Bernardino (	2025	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	1524.029242	72985.77264	72985.77264	0	17617.778	8.005320117	0
San Bernardino (	2025	T6 Instate Other Class 7	Aggregate	Aggregate	Electricity	11.92078418	820.2882646	0	820.2883	137.804265	0	858.2846786
San Bernardino (	2025	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	44.57321051	2147.434228	2147.434228	0	515.266314	0.247720603	0
San Bernardino (	2025	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	24.41451326	1280.661243	1280.661243	0	282.2311773	0.142527976	0
San Bernardino (	2025	T6 Instate Tractor Class 6	Aggregate	Aggregate	Electricity	0.237149255	15.56464506	0	15.56465	2.74144538	0	16.28561197
San Bernardino (	2025	T6 Instate Tractor Class 6	Aggregate	Aggregate	Natural Gas	0.084330179	4.80338753	4.80338753	0	0.97485687	0.000536877	0
San Bernardino (	2025	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	851.017395	51012.9746	51012.9746	0	9837.76109	5.323816218	0
San Bernardino (	2025	T6 Instate Tractor Class 7	Aggregate	Aggregate	Electricity	2.807624774	214.4417727	0	214.4418	32.4561424	0	224.3748885

San Bernardino (	2025 T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	22.35090716	1354.165967	1354.165967	0	258.376487	0.151834313	0
San Bernardino (	2025 T6 OOS Class 4	Aggregate	Aggregate	Diesel	3.471441888	231.0338597	231.0338597	0	79.7737346	0.024618182	0
San Bernardino (	2025 T6 OOS Class 5	Aggregate	Aggregate	Diesel	4.569997548	316.9369102	316.9369102	0	105.018544	0.033830855	0
San Bernardino (	2025 T6 OOS Class 6	Aggregate	Aggregate	Diesel	15.62348203	828.1652139	828.1652139	0	359.027617	0.086599823	0
San Bernardino (	2025 T6 OOS Class 7	Aggregate	Aggregate	Diesel	23.62736296	6021.79092	6021.79092	0	542.956801	0.589837188	0
San Bernardino (	2025 T6 Public Class 4	Aggregate	Aggregate	Diesel	91.86321411	3147.378514	3147.378514	0	471.258288	0.366836606	0
San Bernardino (	2025 T6 Public Class 4	Aggregate	Aggregate	Electricity	0.972176043	41.95346823	0	41.95347	4.9872631	0	44.03354678
San Bernardino (	2025 T6 Public Class 4	Aggregate	Aggregate	Natural Gas	7.649034186	316.6180761	316.6180761	0	39.2395454	0.037512395	0
San Bernardino (	2025 T6 Public Class 5	Aggregate	Aggregate	Diesel	170.3823309	6231.40932	6231.40932	0	874.061357	0.722180421	0
San Bernardino (	2025 T6 Public Class 5	Aggregate	Aggregate	Electricity	1.587809547	68.38557231	0	68.38557	8.14546298	0	71.7761707
San Bernardino (	2025 T6 Public Class 5	Aggregate	Aggregate	Natural Gas	31.723857	1271.704811	1271.704811	0	162.743386	0.152083161	0
San Bernardino (	2025 T6 Public Class 6	Aggregate	Aggregate	Diesel	138.9898444	4878.081734	4878.081734	0	713.017902	0.564254334	0
San Bernardino (	2025 T6 Public Class 6	Aggregate	Aggregate	Electricity	1.550274705	64.42407736	0	64.42408	7.95290924	0	67.61826241
San Bernardino (	2025 T6 Public Class 6	Aggregate	Aggregate	Natural Gas	16.76891058	680.4682607	680.4682607	0	86.0245113	0.081541361	0
San Bernardino (	2025 T6 Public Class 7	Aggregate	Aggregate	Diesel	295.8279928	13593.66606	13593.66606	0	1517.5976	1.543167023	0
San Bernardino (	2025 T6 Public Class 7	Aggregate	Aggregate	Electricity	3.659220406	235.5250153	0	235.525	18.7718007	0	247.2024893
San Bernardino (	2025 T6 Public Class 7	Aggregate	Aggregate	Natural Gas	32.17060533	1746.889655	1746.889655	0	165.035205	0.200323514	0
San Bernardino (	2025 T6 Utility Class 5	Aggregate	Aggregate	Diesel	165.6674555	6709.82091	6709.82091	0	2120.54343	0.720015187	0
San Bernardino (	2025 T6 Utility Class 5	Aggregate	Aggregate	Electricity	2.910769091	126.4924226	0	126.4924	37.2578444	0	132.7639941
San Bernardino (	2025 T6 Utility Class 5	Aggregate	Aggregate	Natural Gas	0.977720946	39.07420664	39.07420664	0	12.5148281	0.004310797	0
San Bernardino (	2025 T6 Utility Class 6	Aggregate	Aggregate	Diesel	31.29937573	1262.678992	1262.678992	0	400.632009	0.1349446	0
San Bernardino (	2025 T6 Utility Class 6	Aggregate	Aggregate	Electricity	0.553814138	24.06744491	0	24.06744	7.08882096	0	25.26072351
San Bernardino (	2025 T6 Utility Class 6	Aggregate	Aggregate	Natural Gas	0.322989724	12.56263198	12.56263198	0	4.13426846	0.001389076	0
San Bernardino (	2025 T6 Utility Class 7	Aggregate	Aggregate	Diesel	35.3312159	1750.664825	1750.664825	0	452.239564	0.186102836	0
San Bernardino (	2025 T6 Utility Class 7	Aggregate	Aggregate	Electricity	0.626194891	38.67585935	0	38.67586	8.0152946	0	40.59343204
San Bernardino (	2025 T6 Utility Class 7	Aggregate	Aggregate	Natural Gas	0.421324414	18.42983082	18.42983082	0	5.3929525	0.002011091	0
San Bernardino (	2025 T6TS	Aggregate	Aggregate	Gasoline	1427.423114	76828.767	76828.767	0	28559.8817	14.58515666	0
San Bernardino (	2025 T6TS	Aggregate	Aggregate	Electricity	10.29995955	963.1885609	0	963.1886	206.081591	0	1009.385006
San Bernardino (	2025 T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	1704.892962	351668.8762	351668.8762	0	39178.4403	55.99138451	0
San Bernardino (	2025 T7 CAIRP Class 8	Aggregate	Aggregate	Electricity	21.53021919	4291.670748	0	4291.671	494.764437	0	7670.364066
San Bernardino (	2025 T7 CAIRP Class 8	Aggregate	Aggregate	Natural Gas	7.02364257	1433.040879	1433.040879	0	161.403306	0.247923385	0
San Bernardino (	2025 T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	1543.320362	423226.327	423226.327	0	35465.5019	65.49375246	0
San Bernardino (	2025 T7 NOOS Class 8	Aggregate	Aggregate	Diesel	653.2574882	153673.9142	153673.9142	0	15011.8571	24.35129605	0
San Bernardino (	2025 T7 POLA Class 8	Aggregate	Aggregate	Diesel	2223.053132	280559.2904	280559.2904	0	36369.1492	46.99995605	0
San Bernardino (	2025 T7 POLA Class 8	Aggregate	Aggregate	Electricity	4.452577156	481.4007157	0	481.4007	72.8441623	0	859.5541731
San Bernardino (	2025 T7 POLA Class 8	Aggregate	Aggregate	Natural Gas	23.71028976	2967.974326	2967.974326	0	387.900341	0.505024562	0
San Bernardino (	2025 T7 Public Class 8	Aggregate	Aggregate	Diesel	671.3881365	27197.25305	27197.25305	0	3444.22114	4.665820373	0
San Bernardino (	2025 T7 Public Class 8	Aggregate	Aggregate	Electricity	6.866016336	440.0704517	0	440.0705	35.2226638	0	785.6229168
San Bernardino (	2025 T7 Public Class 8	Aggregate	Aggregate	Natural Gas	240.2942661	12158.4253	12158.4253	0	1232.70959	1.92823272	0
San Bernardino (	2025 T7 Single Concrete/Transit	Aggregate	Aggregate	Diesel	386.4911701	26725.32937	26725.32937	0	3640.74682	4.388702884	0
San Bernardino (	2025 T7 Single Concrete/Transit	Aggregate	Aggregate	Electricity	7.232768538	604.3602703	0	604.3603	68.1326796	0	1079.374799
San Bernardino (	2025 T7 Single Concrete/Transit	Aggregate	Aggregate	Natural Gas	33.75278409	2369.602341	2369.602341	0	317.951226	0.379400546	0
San Bernardino (	2025 T7 Single Dump Class 8	Aggregate	Aggregate	Diesel	726.49267	41155.80059	41155.80059	0	6843.56095	6.913786265	0
San Bernardino (	2025 T7 Single Dump Class 8	Aggregate	Aggregate	Electricity	5.149145433	414.1383099	0	414.1383	48.50495	0	739.6423576
San Bernardino (	2025 T7 Single Dump Class 8	Aggregate	Aggregate	Natural Gas	46.93300983	2874.674897	2874.674897	0	442.108953	0.494401196	0
San Bernardino (	2025 T7 Single Other Class 8	Aggregate	Aggregate	Diesel	2388.843245	129412.3919	129412.3919	0	22502.9034	21.40257066	0
San Bernardino (	2025 T7 Single Other Class 8	Aggregate	Aggregate	Electricity	26.56843494	1828.09365	0	1828.094	250.274657	0	3264.937015
San Bernardino (	2025 T7 Single Other Class 8	Aggregate	Aggregate	Natural Gas	170.1044086	9710.227878	9710.227878	0	1602.38353	1.612871052	0
San Bernardino (	2025 T7 SWCV Class 8	Aggregate	Aggregate	Diesel	418.5183242	27173.17663	27173.17663	0	1925.18429	9.94989036	0
San Bernardino (	2025 T7 SWCV Class 8	Aggregate	Aggregate	Electricity	15.04326343	922.5436308	0	922.5436	69.1990118	0	1645.150397
San Bernardino (	2025 T7 SWCV Class 8	Aggregate	Aggregate	Natural Gas	1912.940397	123791.6814	123791.6814	0	8799.52583	19.1761858	0
San Bernardino (	2025 T7 Tractor Class 8	Aggregate	Aggregate	Diesel	3856.097342	290789.1005	290789.1005	0	56029.0944	46.82923375	0
San Bernardino (	2025 T7 Tractor Class 8	Aggregate	Aggregate	Electricity	22.0340046	1813.340263	0	1813.34	320.154087	0	3236.212458
San Bernardino (	2025 T7 Tractor Class 8	Aggregate	Aggregate	Natural Gas	125.7588018	9657.96051	9657.96051	0	1827.27539	1.688327532	0
San Bernardino (	2025 T7 Utility Class 8	Aggregate	Aggregate	Diesel	121.2475914	5383.303927	5383.303927	0	1551.96917	0.869210361	0
San Bernardino (	2025 T7 Utility Class 8	Aggregate	Aggregate	Electricity	0.712845009	45.58710379	0	45.5871	9.12441611	0	81.38304517
San Bernardino (	2025 T7IS	Aggregate	Aggregate	Gasoline	3.869766832	177.2217014	177.2217014	0	77.4262948	0.044579975	0
San Bernardino (	2025 T7IS	Aggregate	Aggregate	Electricity	0.009245663	2.762771433	0	2.762771	0.18498722	0	4.927042374
San Bernardino (	2025 UBUS	Aggregate	Aggregate	Gasoline	54.83056931	5264.458034	5264.458034	0	219.322277	0.406547565	0
San Bernardino (	2025 UBUS	Aggregate	Aggregate	Diesel	4.529432466	447.4667714	447.4667714	0	18.1177299	0.043317656	0
San Bernardino (	2025 UBUS	Aggregate	Aggregate	Electricity	7.409987909	1124.502697	0	1124.503	29.6399516	0	2200.084218
San Bernardino (	2025 UBUS	Aggregate	Aggregate	Natural Gas	243.8212922	33368.01555	33368.01555	0	975.285169	7.825519274	0

EMFAC Fuel Usage: Year 2050

Vehicle type	GAS			DSL			NG			ELEC		
	VTM/day	Gallons/day	Miles/gallon	VTM/day	Gallons/day	Miles/gallon	VTM/day	Gallons/day	Miles/gallon	VTM/day	kWh/day	Miles/kWh
All other buses	0	0	0.00	9,716	912	10.65	2,947	295	9.99	0	0	0.00
LDA	20,486,500	553,972	36.98	11,614	208	55.89	0	0	0.00	3,090,285	1,146,144	2.70
LDT1	1,242,492	38,641	32.15	15	0	29.87	0	0	0.00	57,449	20,648	2.78
LDT2	10,548,283	340,325	30.99	39,896	988	40.39	0	0	0.00	466,467	165,616	2.82
LHD1	361,552	20,934	17.27	240,687	11,003	21.88	0	0	0.00	591,815	331,308	1.79
LHD2	43,119	2,815	15.32	114,367	6,132	18.65	0	0	0.00	144,719	81,127	1.78
MCY	124,934	2,836	44.06	0	0	0.00	0	0	0.00	0	0	0.00
MDV	6,339,402	246,761	25.69	67,801	2,190	30.95	0	0	0.00	387,350	140,037	2.77
MH	15,945	3,262	4.89	9,013	890	10.13	0	0	0.00	0	0	0.00
Motor coach	0	0	0.00	7,003	1,075	6.52	0	0	0.00	0	0	0.00
OBUS	4,866	819	5.94	0	0	0.00	0	0	0.00	6,670	7,005	0.95
PTO	0	0	0.00	35,690	6,018	5.93	0	0	0.00	41,487	85,942	0.48
SBUS	4,550	444	10.24	2,326	276	8.42	5,995	1,253	4.78	13,217	15,283	0.86
T6	32,821	5,363	6.12	606,350	59,671	10.16	10,374	1,173	8.84	700,670	732,372	0.96
T7	114	21	5.33	2,888,449	382,412	7.55	150,435	20,834	7.22	671,002	1,198,063	0.56
UBUS	8,248	520	15.87	0	0	0.00	8,017	563	14.23	51,079	100,035	0.51
Total	39,212,827	1,216,712	32.23	4,032,926	471,775	8.55	177,768	24,119	7.37	6,222,209	4,023,580	1.55

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: Sub-Area

Region: San Bernardino (SC)

Calendar Year: 2025, 2050

Season: Annual

Vehicle Classification: EMFAC202X Categories

Units: miles/day for Combustion VMT and Electric VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption, kWh/day for Energy Consumption

Region	Calendar Year	Vehicle Category	Model Year	Speed	Fuel	Population	Total VMT	CVMT	EVMT	Trips	Fuel Consumption	Energy Consumption
San Bernardino (	2050	All Other Buses	Aggregate	Aggregate	Diesel	190.0039446	9715.698348	9715.698348	0	1691.03511	0.911897679	0
San Bernardino (	2050	All Other Buses	Aggregate	Aggregate	Natural Gas	56.2481208	2946.530911	2946.530911	0	500.608275	0.294993421	0
San Bernardino (	2050	LDA	Aggregate	Aggregate	Gasoline	479562.4591	20102501.8	20102501.8	0	2229938.18	540.9384552	0
San Bernardino (	2050	LDA	Aggregate	Aggregate	Diesel	293.3189727	11614.21395	11614.21395	0	1331.20943	0.207817501	0
San Bernardino (	2050	LDA	Aggregate	Aggregate	Electricity	66442.77135	2531574.81	0	2531574.81	311469.176	0	977396.8189
San Bernardino (	2050	LDA	Aggregate	Aggregate	Plug-in Hybrid	22585.56718	942708.4567	383998.5458	558709.9108	93391.3203	13.03321564	168747.0453
San Bernardino (	2050	LDT1	Aggregate	Aggregate	Gasoline	33893.96457	1229992.696	1229992.696	0	153117.603	38.21206737	0
San Bernardino (	2050	LDT1	Aggregate	Aggregate	Diesel	0.393709711	14.72915349	14.72915349	0	1.80890437	0.000493111	0
San Bernardino (	2050	LDT1	Aggregate	Aggregate	Electricity	1054.969063	39228.96427	0	39228.96427	4904.86897	0	15145.61795
San Bernardino (	2050	LDT1	Aggregate	Aggregate	Plug-in Hybrid	804.707976	30718.97531	12499.31709	18219.65822	3327.46748	0.429176951	5502.879816
San Bernardino (	2050	LDT2	Aggregate	Aggregate	Gasoline	274596.2535	10429930.84	10429930.84	0	1268159.97	336.2499309	0
San Bernardino (	2050	LDT2	Aggregate	Aggregate	Diesel	1045.134092	39895.86835	39895.86835	0	4841.54408	0.987753912	0
San Bernardino (	2050	LDT2	Aggregate	Aggregate	Electricity	11208.95187	294206.421	0	294206.421	52468.5981	0	113587.9607
San Bernardino (	2050	LDT2	Aggregate	Aggregate	Plug-in Hybrid	7608.799559	290612.2249	118351.9123	172260.3126	31462.3862	4.075237396	52027.74859
San Bernardino (	2050	LHD1	Aggregate	Aggregate	Gasoline	10357.61967	361551.7155	361551.7155	0	154313.1	20.93362927	0
San Bernardino (	2050	LHD1	Aggregate	Aggregate	Diesel	7168.902015	240687.2733	240687.2733	0	90175.7689	11.00259414	0
San Bernardino (	2050	LHD1	Aggregate	Aggregate	Electricity	14749.42958	591814.7824	0	591814.7824	206465.045	0	331308.4384
San Bernardino (	2050	LHD2	Aggregate	Aggregate	Gasoline	1298.21399	43119.44596	43119.44596	0	19341.4541	2.815274393	0
San Bernardino (	2050	LHD2	Aggregate	Aggregate	Diesel	3614.286708	114366.7292	114366.7292	0	45463.18	6.131889234	0
San Bernardino (	2050	LHD2	Aggregate	Aggregate	Electricity	3725.242292	144719.3507	0	144719.3507	49285.5161	0	81126.95993
San Bernardino (	2050	MCY	Aggregate	Aggregate	Gasoline	22648.52804	124934.3577	124934.3577	0	45297.0561	2.835518159	0
San Bernardino (	2050	MDV	Aggregate	Aggregate	Gasoline	164730.8581	6261626.299	6261626.299	0	754182.567	244.0481992	0
San Bernardino (	2050	MDV	Aggregate	Aggregate	Diesel	1807.282702	67801.34532	67801.34532	0	8216.57165	2.190333457	0
San Bernardino (	2050	MDV	Aggregate	Aggregate	Electricity	10611.78069	274184.7286	0	274184.7286	49394.8197	0	105857.935
San Bernardino (	2050	MDV	Aggregate	Aggregate	Plug-in Hybrid	4996.656844	190940.2031	77775.43006	113164.7731	20661.176	2.712726731	34179.13432
San Bernardino (	2050	MH	Aggregate	Aggregate	Gasoline	1541.570404	15945.46247	15945.46247	0	154.218703	3.261714912	0
San Bernardino (	2050	MH	Aggregate	Aggregate	Diesel	992.1821755	9012.724826	9012.724826	0	99.2182176	0.890023992	0
San Bernardino (	2050	Motor Coach	Aggregate	Aggregate	Diesel	55.59534343	7002.604945	7002.604945	0	1277.58099	1.074690931	0
San Bernardino (	2050	OBUS	Aggregate	Aggregate	Gasoline	148.5689442	4865.875041	4865.875041	0	2972.56744	0.818628069	0
San Bernardino (	2050	OBUS	Aggregate	Aggregate	Electricity	121.9019108	6669.864428	0	6669.864428	2439.01343	0	7004.809233
San Bernardino (	2050	PTO	Aggregate	Aggregate	Diesel	0	35690.15288	35690.15288	0	0	6.01830781	0
San Bernardino (	2050	PTO	Aggregate	Aggregate	Electricity	0	41487.39594	0	41487.39594	0	0	85941.91933
San Bernardino (	2050	SBUS	Aggregate	Aggregate	Gasoline	102.0917625	4549.887697	4549.887697	0	408.36705	0.444272253	0
San Bernardino (	2050	SBUS	Aggregate	Aggregate	Diesel	112.4994631	2325.837313	2325.837313	0	1628.99223	0.276160007	0
San Bernardino (	2050	SBUS	Aggregate	Aggregate	Electricity	477.4128398	13217.39438	0	13217.39438	6032.28014	0	15283.29087
San Bernardino (	2050	SBUS	Aggregate	Aggregate	Natural Gas	288.3956766	5995.008005	5995.008005	0	4175.9694	1.253323614	0
San Bernardino (	2050	T6 CAIRP Class 4	Aggregate	Aggregate	Diesel	4.039614479	298.5842079	298.5842079	0	92.8303407	0.029051996	0
San Bernardino (	2050	T6 CAIRP Class 4	Aggregate	Aggregate	Electricity	6.019859808	460.3753212	0	460.3753212	138.336378	0	483.6626294
San Bernardino (	2050	T6 CAIRP Class 5	Aggregate	Aggregate	Diesel	4.956095365	409.8003971	409.8003971	0	113.891071	0.039847963	0
San Bernardino (	2050	T6 CAIRP Class 5	Aggregate	Aggregate	Electricity	7.377361164	631.3555978	0	631.3555978	169.53176	0	663.2916545
San Bernardino (	2050	T6 CAIRP Class 6	Aggregate	Aggregate	Diesel	22.62071598	1069.703231	1069.703231	0	519.824053	0.104459128	0
San Bernardino (	2050	T6 CAIRP Class 6	Aggregate	Aggregate	Electricity	33.78294543	1650.867172	0	1650.867172	776.332086	0	1734.373499
San Bernardino (	2050	T6 CAIRP Class 7	Aggregate	Aggregate	Diesel	62.60823509	12843.92367	12843.92367	0	1438.73724	1.10034642	0
San Bernardino (	2050	T6 CAIRP Class 7	Aggregate	Aggregate	Electricity	19.90486537	4212.431246	0	4212.431246	457.413806	0	4425.509967
San Bernardino (	2050	T6 CAIRP Class 7	Aggregate	Aggregate	Natural Gas	0.041135273	8.437769251	8.437769251	0	0.94528857	0.000784213	0
San Bernardino (	2050	T6 Instate Delivery Class 4	Aggregate	Aggregate	Diesel	540.9415446	18117.76082	18117.76082	0	7719.23584	1.827609182	0
San Bernardino (	2050	T6 Instate Delivery Class 4	Aggregate	Aggregate	Electricity	696.9382923	24309.36403	0	24309.36403	9945.30943	0	25396.2113
San Bernardino (	2050	T6 Instate Delivery Class 4	Aggregate	Aggregate	Natural Gas	4.210408319	141.3826917	141.3826917	0	60.0825267	0.016170846	0
San Bernardino (	2050	T6 Instate Delivery Class 5	Aggregate	Aggregate	Diesel	656.3668944	21987.17001	21987.17001	0	9366.35558	2.218923729	0
San Bernardino (	2050	T6 Instate Delivery Class 5	Aggregate	Aggregate	Electricity	846.697478	29527.15409	0	29527.15409	12082.373	0	30847.28352
San Bernardino (	2050	T6 Instate Delivery Class 5	Aggregate	Aggregate	Natural Gas	5.074804471	170.6044601	170.6044601	0	72.4174598	0.019502582	0
San Bernardino (	2050	T6 Instate Delivery Class 6	Aggregate	Aggregate	Diesel	2610.445049	87404.91138	87404.91138	0	37251.0509	8.81718469	0
San Bernardino (	2050	T6 Instate Delivery Class 6	Aggregate	Aggregate	Electricity	3366.577178	117271.8064	0	117271.8064	48041.0563	0	122514.9112
San Bernardino (	2050	T6 Instate Delivery Class 6	Aggregate	Aggregate	Natural Gas	20.22670396	679.4307793	679.4307793	0	288.635066	0.077674881	0
San Bernardino (	2050	T6 Instate Delivery Class 7	Aggregate	Aggregate	Diesel	652.0380008	33255.42465	33255.42465	0	9304.58227	3.329609994	0
San Bernardino (	2050	T6 Instate Delivery Class 7	Aggregate	Aggregate	Electricity	502.0864196	26565.19055	0	26565.19055	7164.77321	0	27752.89356
San Bernardino (	2050	T6 Instate Delivery Class 7	Aggregate	Aggregate	Natural Gas	15.42657844	784.195736	784.195736	0	220.137274	0.086364833	0
San Bernardino (	2050	T6 Instate Other Class 4	Aggregate	Aggregate	Diesel	1016.713807	40516.27389	40516.27389	0	11753.2116	4.063193376	0
San Bernardino (	2050	T6 Instate Other Class 4	Aggregate	Aggregate	Electricity	1308.025498	56086.57128	0	56086.57128	15120.7748	0	58611.67628
San Bernardino (	2050	T6 Instate Other Class 4	Aggregate	Aggregate	Natural Gas	7.930236857	317.7814611	317.7814611	0	91.6735381	0.03565655	0
San Bernardino (	2050	T6 Instate Other Class 5	Aggregate	Aggregate	Diesel	2712.22508	108125.9805	108125.9805	0	31353.3219	10.84594971	0
San Bernardino (	2050	T6 Instate Other Class 5	Aggregate	Aggregate	Electricity	3489.740346	149769.7878	0	149769.7878	40341.3984	0	156512.6574
San Bernardino (	2050	T6 Instate Other Class 5	Aggregate	Aggregate	Natural Gas	21.02559343	844.7646717	844.7646717	0	243.05586	0.094711649	0
San Bernardino (	2050	T6 Instate Other Class 6	Aggregate	Aggregate	Diesel	2326.894012	92695.3254	92695.3254	0	26898.8948	9.296365217	0
San Bernardino (	2050	T6 Instate Other Class 6	Aggregate	Aggregate	Electricity	2992.053991	128213.6877	0	128213.6877	34588.1441	0	133986.0681
San Bernardino (	2050	T6 Instate Other Class 6	Aggregate	Aggregate	Natural Gas	18.03746938	724.1642591	724.1642591	0	208.513146	0.081192929	0
San Bernardino (	2050	T6 Instate Other Class 7	Aggregate	Aggregate	Diesel	1832.040703	75556.38812	75556.38812	0	21178.3905	7.591391413	0
San Bernardino (	2050	T6 Instate Other Class 7	Aggregate	Aggregate	Electricity	1370.447316	69801.06012	0	69801.06012	15842.371	0	72943.61281
San Bernardino (	2050	T6 Instate Other Class 7	Aggregate	Aggregate	Natural Gas	44.58817215	1795.965465	1795.965465	0	515.43927	0.20326738	0
San Bernardino (	2050	T6 Instate Tractor Class 6	Aggregate	Aggregate	Diesel	21.17817713	1043.287371	1043.287371	0	244.819728	0.103754594	0
San Bernardino (	2050	T6 Instate Tractor Class 6	Aggregate	Aggregate	Electricity	27.15184054	1469.172468	0	1469.172468	313.875277	0	1535.316906
San Bernardino (	2050	T6 Instate Tractor Class 6	Aggregate	Aggregate	Natural Gas	0.164749385	8.173331621	8.173331621	0	1.90450289	0.0008939	0
San Bernardino (	2050	T6 Instate Tractor Class 7	Aggregate	Aggregate	Diesel	1338.080386	78713.04802	78713.04802	0	15468.2093	7.050985345	0
San Bernardino (	2050	T6 Instate Tractor Class 7	Aggregate	Aggregate	Electricity	318.1967724	21332.38275	0	21332.38275	3678.35469	0	22292.79992

San Bernardino (	2050 T6 Instate Tractor Class 7	Aggregate	Aggregate	Natural Gas	31.28000424	1826.896828	1826.896828	0	361.596849	0.193265676	0
San Bernardino (	2050 T6 OOS Class 4	Aggregate	Aggregate	Diesel	6.028153495	447.608383	447.608383	0	138.526967	0.04092636	0
San Bernardino (	2050 T6 OOS Class 5	Aggregate	Aggregate	Diesel	7.400364275	614.0382109	614.0382109	0	170.060371	0.056120747	0
San Bernardino (	2050 T6 OOS Class 6	Aggregate	Aggregate	Diesel	33.70661204	1604.499413	1604.499413	0	774.577945	0.147151766	0
San Bernardino (	2050 T6 OOS Class 7	Aggregate	Aggregate	Diesel	41.50453306	11666.70591	11666.70591	0	953.77417	0.955062379	0
San Bernardino (	2050 T6 Public Class 4	Aggregate	Aggregate	Diesel	45.73142881	1584.922291	1584.922291	0	234.60223	0.166403428	0
San Bernardino (	2050 T6 Public Class 4	Aggregate	Aggregate	Electricity	54.3446567	2073.531168	0	2073.531168	278.788089	0	2175.187625
San Bernardino (	2050 T6 Public Class 4	Aggregate	Aggregate	Natural Gas	8.765449705	304.4964998	304.4964998	0	44.966757	0.0366607	0
San Bernardino (	2050 T6 Public Class 5	Aggregate	Aggregate	Diesel	98.81907228	3417.676143	3417.676143	0	506.941841	0.360145845	0
San Bernardino (	2050 T6 Public Class 5	Aggregate	Aggregate	Electricity	116.8570447	4452.329006	0	4452.329006	599.47664	0	4670.607853
San Bernardino (	2050 T6 Public Class 5	Aggregate	Aggregate	Natural Gas	20.06658244	688.438052	688.438052	0	102.941568	0.083173725	0
San Bernardino (	2050 T6 Public Class 6	Aggregate	Aggregate	Diesel	73.95512156	2554.461108	2554.461108	0	379.389774	0.268353839	0
San Bernardino (	2050 T6 Public Class 6	Aggregate	Aggregate	Electricity	86.77743033	3300.669221	0	3300.669221	445.168218	0	3462.487063
San Bernardino (	2050 T6 Public Class 6	Aggregate	Aggregate	Natural Gas	14.53011955	500.797308	500.797308	0	74.5395133	0.06046823	0
San Bernardino (	2050 T6 Public Class 7	Aggregate	Aggregate	Diesel	190.4767631	8032.805204	8032.805204	0	977.145795	0.822237753	0
San Bernardino (	2050 T6 Public Class 7	Aggregate	Aggregate	Electricity	172.1018201	8020.543437	0	8020.543437	882.882337	0	8413.756736
San Bernardino (	2050 T6 Public Class 7	Aggregate	Aggregate	Natural Gas	36.79894207	1553.071147	1553.071147	0	188.778573	0.180608087	0
San Bernardino (	2050 T6 Utility Class 5	Aggregate	Aggregate	Diesel	75.47617281	3029.302582	3029.302582	0	966.095012	0.301268346	0
San Bernardino (	2050 T6 Utility Class 5	Aggregate	Aggregate	Electricity	115.8145057	4724.877102	0	4724.877102	1482.42567	0	4956.517829
San Bernardino (	2050 T6 Utility Class 5	Aggregate	Aggregate	Natural Gas	0.433857903	17.41326853	17.41326853	0	5.55338115	0.001861801	0
San Bernardino (	2050 T6 Utility Class 6	Aggregate	Aggregate	Diesel	14.26333531	572.4833334	572.4833334	0	182.570692	0.056934291	0
San Bernardino (	2050 T6 Utility Class 6	Aggregate	Aggregate	Electricity	21.88577893	892.8996245	0	892.8996245	280.13797	0	936.6747139
San Bernardino (	2050 T6 Utility Class 6	Aggregate	Aggregate	Natural Gas	0.081989594	3.290792432	3.290792432	0	1.0494668	0.000351846	0
San Bernardino (	2050 T6 Utility Class 7	Aggregate	Aggregate	Diesel	15.86795833	788.4130379	788.4130379	0	203.109867	0.077961999	0
San Bernardino (	2050 T6 Utility Class 7	Aggregate	Aggregate	Electricity	24.35151078	1250.467992	0	1250.467992	311.699338	0	1311.773145
San Bernardino (	2050 T6 Utility Class 7	Aggregate	Aggregate	Natural Gas	0.09121341	4.532016055	4.532016055	0	1.16753165	0.000474939	0
San Bernardino (	2050 T6TS	Aggregate	Aggregate	Gasoline	655.4784219	32821.38627	32821.38627	0	13114.8123	5.363241077	0
San Bernardino (	2050 T6TS	Aggregate	Aggregate	Electricity	707.3011704	44653.64966	0	44653.64966	14151.6818	0	46745.00604
San Bernardino (	2050 T7 CAIRP Class 8	Aggregate	Aggregate	Diesel	2821.624464	597223.1685	597223.1685	0	64840.9302	79.92372171	0
San Bernardino (	2050 T7 CAIRP Class 8	Aggregate	Aggregate	Electricity	801.0527992	175332.2117	0	175332.2117	18408.1933	0	313397.9545
San Bernardino (	2050 T7 CAIRP Class 8	Aggregate	Aggregate	Natural Gas	10.32254863	2184.850741	2184.850741	0	237.212167	0.345030397	0
San Bernardino (	2050 T7 NNOOS Class 8	Aggregate	Aggregate	Diesel	3159.337073	917449.2032	917449.2032	0	72601.5659	116.7024067	0
San Bernardino (	2050 T7 NOOS Class 8	Aggregate	Aggregate	Diesel	1362.444925	333126.7483	333126.7483	0	31308.9844	42.8718602	0
San Bernardino (	2050 T7 POLA Class 8	Aggregate	Aggregate	Diesel	1830.97323	336829.5667	336829.5667	0	29954.722	45.84615603	0
San Bernardino (	2050 T7 POLA Class 8	Aggregate	Aggregate	Electricity	369.4794614	67315.76077	0	67315.76077	6044.68399	0	120167.7844
San Bernardino (	2050 T7 POLA Class 8	Aggregate	Aggregate	Natural Gas	73.76040986	13568.16159	13568.16159	0	1206.72031	1.909727315	0
San Bernardino (	2050 T7 Public Class 8	Aggregate	Aggregate	Diesel	224.823919	8634.126246	8634.126246	0	1153.3467	1.328386277	0
San Bernardino (	2050 T7 Public Class 8	Aggregate	Aggregate	Electricity	453.6730659	20630.06334	0	20630.06334	2327.34283	0	36826.54623
San Bernardino (	2050 T7 Public Class 8	Aggregate	Aggregate	Natural Gas	376.6785595	15718.92725	15718.92725	0	1932.36101	2.393411309	0
San Bernardino (	2050 T7 Single Concrete/Transit f	Aggregate	Aggregate	Diesel	191.1199155	12867.38079	12867.38079	0	1800.3496	1.865753841	0
San Bernardino (	2050 T7 Single Concrete/Transit f	Aggregate	Aggregate	Electricity	276.3689038	19429.26074	0	19429.26074	2603.39507	0	34692.18233
San Bernardino (	2050 T7 Single Concrete/Transit f	Aggregate	Aggregate	Natural Gas	14.92022834	1004.365797	1004.365797	0	140.548551	0.15109977	0
San Bernardino (	2050 T7 Single Dump Class 8	Aggregate	Aggregate	Diesel	450.4511973	22616.46203	22616.46203	0	4243.25028	3.375686734	0
San Bernardino (	2050 T7 Single Dump Class 8	Aggregate	Aggregate	Electricity	424.8706092	25459.40592	0	25459.40592	4002.28114	0	45459.39055
San Bernardino (	2050 T7 Single Dump Class 8	Aggregate	Aggregate	Natural Gas	34.9602061	1758.667197	1758.667197	0	329.325141	0.27762583	0
San Bernardino (	2050 T7 Single Other Class 8	Aggregate	Aggregate	Diesel	3002.418659	131251.5601	131251.5601	0	28282.7838	19.57129349	0
San Bernardino (	2050 T7 Single Other Class 8	Aggregate	Aggregate	Electricity	3257.10123	164050.152	0	164050.152	30681.8936	0	292921.9933
San Bernardino (	2050 T7 Single Other Class 8	Aggregate	Aggregate	Natural Gas	234.3456411	10244.30781	10244.30781	0	2207.53594	1.640357325	0
San Bernardino (	2050 T7 SWCV Class 8	Aggregate	Aggregate	Diesel	14.37487094	759.6393552	759.6393552	0	66.1244063	0.258476769	0
San Bernardino (	2050 T7 SWCV Class 8	Aggregate	Aggregate	Electricity	1229.412953	79465.79837	0	79465.79837	5655.29958	0	141656.8387
San Bernardino (	2050 T7 SWCV Class 8	Aggregate	Aggregate	Natural Gas	1408.634979	91460.45686	91460.45686	0	6479.7209	11.79298044	0
San Bernardino (	2050 T7 Tractor Class 8	Aggregate	Aggregate	Diesel	7902.086266	524495.682	524495.682	0	114817.313	70.19790752	0
San Bernardino (	2050 T7 Tractor Class 8	Aggregate	Aggregate	Electricity	1621.537851	116234.196	0	116234.196	23560.945	0	207434.1668
San Bernardino (	2050 T7 Tractor Class 8	Aggregate	Aggregate	Natural Gas	218.7457614	14495.34451	14495.34451	0	3178.37591	2.324099243	0
San Bernardino (	2050 T7 Utility Class 8	Aggregate	Aggregate	Diesel	77.39234367	3195.010442	3195.010442	0	990.621999	0.47033871	0
San Bernardino (	2050 T7 Utility Class 8	Aggregate	Aggregate	Electricity	64.12771245	2941.535467	0	2941.535467	820.834719	0	5250.909321
San Bernardino (	2050 T7IS	Aggregate	Aggregate	Gasoline	0.913768675	114.1788283	114.1788283	0	18.2826836	0.021427485	0
San Bernardino (	2050 T7IS	Aggregate	Aggregate	Electricity	0.961757771	143.1514253	0	143.1514253	19.2428495	0	255.0766747
San Bernardino (	2050 UBUS	Aggregate	Aggregate	Gasoline	84.28772604	8247.655866	8247.655866	0	337.150904	0.519540157	0
San Bernardino (	2050 UBUS	Aggregate	Aggregate	Electricity	333.5515118	51079.15059	0	51079.15059	1334.20605	0	100034.6223
San Bernardino (	2050 UBUS	Aggregate	Aggregate	Natural Gas	102.4124248	8017.093903	8017.093903	0	409.649699	0.563320465	0

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

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

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APR - 8 2015

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**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.

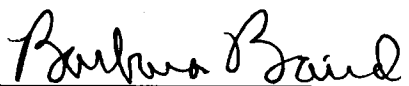
CERTIFICATION REGARDING AUTHORSHIP AND FUNDING

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.

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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.

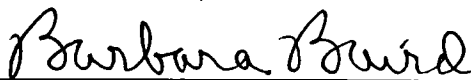
CONCLUSION

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

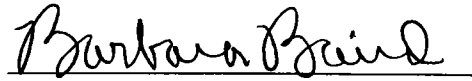
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

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

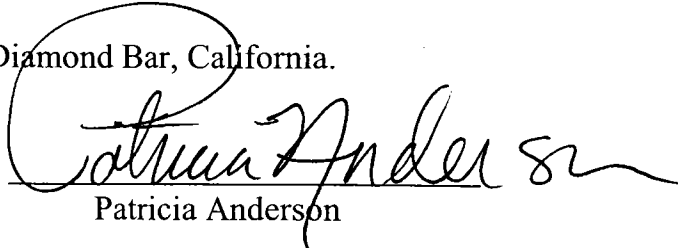
I am employed in the County of Los Angeles, California. I am over the age of 18 years and not a party to the within action. My business address is 21865 Copley Drive, Diamond Bar, California 91765.

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

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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
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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

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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.

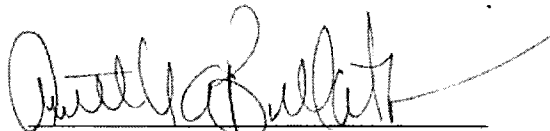
Rule 8.520 Disclosure

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

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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

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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.

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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/particulatepollution/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%20August%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.

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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

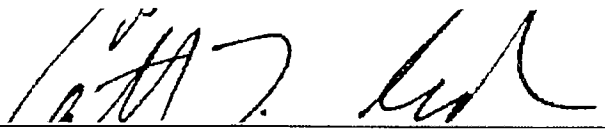
For all of the foregoing reasons, the Air District respectfully requests that the portion of the Court of Appeal’s decision requiring an analysis correlating the localized human health impacts associated with an individual project’s criteria air pollutant emissions be reversed.

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.

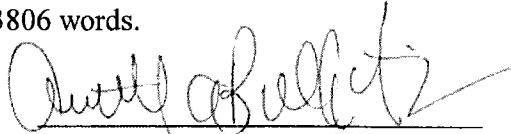
Catherine T. Redmond
Attorney for Proposed Amicus
Curiae

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:

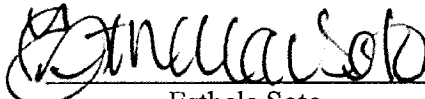
**APPLICATION FOR LEAVE TO FILE AMICUS CURIAE BRIEF OF
SAN JOAQUIN VALLEY UNIFIED AIR POLLUTION CONTROL DISTRICT IN
SUPPORT OF DEFENDANT AND RESPONDENT, COUNTY OF FRESNO**

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	
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