

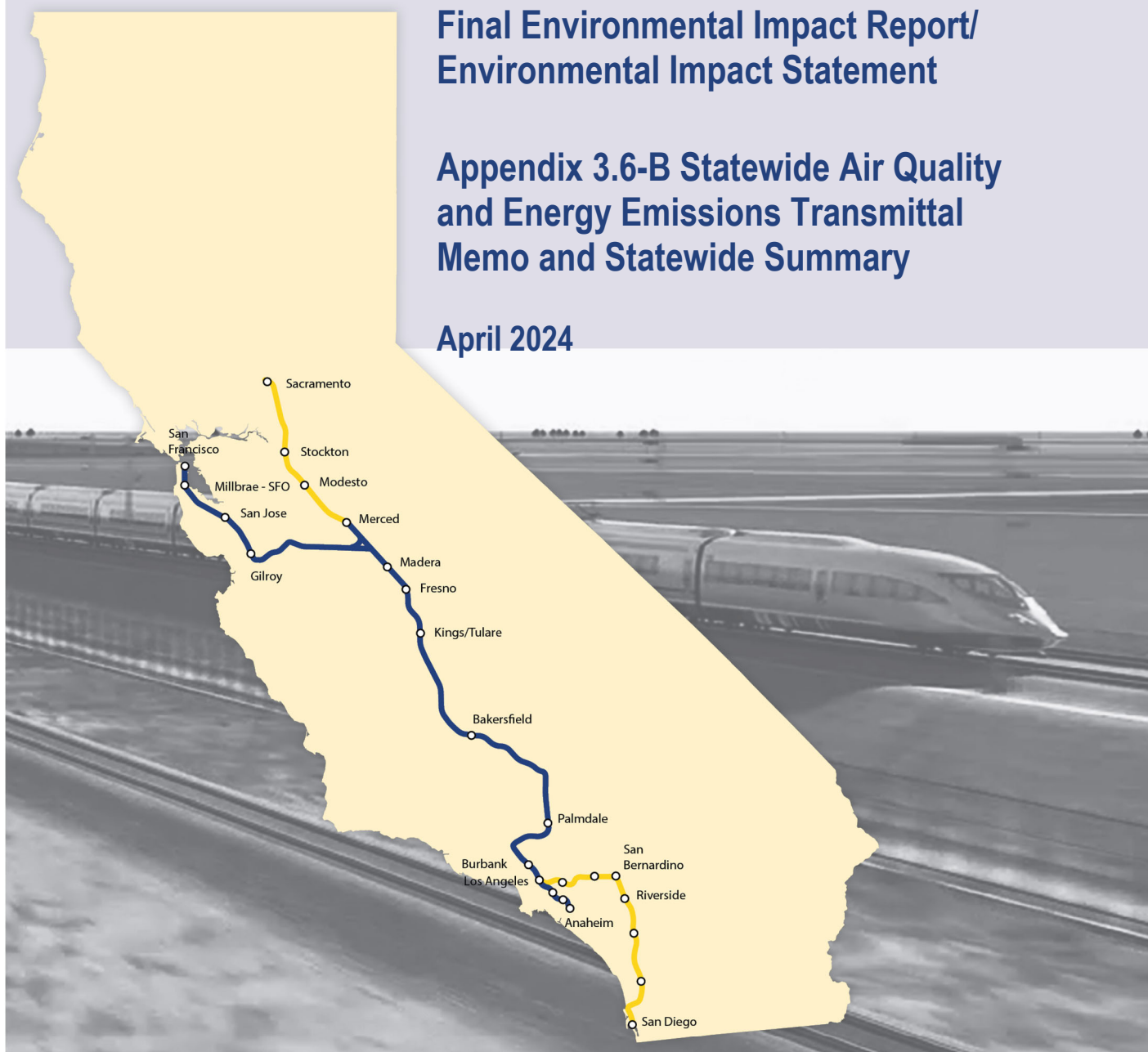
California High-Speed Rail Authority

Palmdale to Burbank *Project Section*

Final Environmental Impact Report/
Environmental Impact Statement

Appendix 3.6-B Statewide Air Quality
and Energy Emissions Transmittal
Memo and Statewide Summary

April 2024



The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the State of California pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated July 23, 2019, and executed by the Federal Railroad Administration and the State of California.

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Memorandum

DATE: October 2020
TO: Authority and Regional Consultant Environmental Staff
FROM: Alice Lovegrove and Edward Tadross, WSP
CC: Bryan Porter
SUBJECT: California High-Speed Rail Statewide Criteria Pollutant and GHG Analysis

This memo describes the calculation of statewide criteria pollutant and greenhouse gas (GHG) emission levels associated with future operation of the California High-Speed Rail Project. This memo is meant to accompany Excel spreadsheet files with statewide summary emission data for the following high-speed rail (HSR) sections: Palmdale to Burbank and Los Angeles to Anaheim. An earlier analysis of emission levels for the other HSR sections was completed several years ago.

The spreadsheets consist of multiple tables. The list below explains what is included as part of each spreadsheet file.

- MED - EX(2015) & EX+PROJ = Medium Alternative 2015 (Existing & Existing Plus Project)
- MED - 2029 NB&BD = Medium Alternative 2029 (No Build & Build)
- MED - 2040 NB&BD = Medium Alternative 2040 (No Build & Build)
- HIGH - EX(2015) & EX+PROJ = High Alternative 2015 (Existing & Existing Plus Project)
- HIGH - 2029 NB&BD = High Alternative 2029 (No Build & Build)
- HIGH - 2040 NB&BD = High Alternative 2040 (No Build & Build)

Provided below is a description of the emission calculations. You can also use this text in preparing the air quality section for your HSR section environmental impact report/environmental impact statement (EIR/EIS). Should you have specific questions about the methodology used to derive the emission burdens, please contact Alice Lovegrove at alice.lovegrove@wsp.com or Edward Tadross at edward.tadross@wsp.com.

Statewide and Regional Operational Emissions Calculations

The emission burden analysis of a project determines a project's overall impact on air quality levels. The project section would affect long-distance, city-to-city travel along freeways and highways throughout the state, as well as long-distance, city-to-city aircraft takeoffs and landings. The HSR system would also affect electrical demand throughout the state. Analysts calculated criteria pollutant and GHG operational emissions for two ridership scenarios: a medium ridership scenario of the Silicon Valley to Central Valley line (from San Jose to North of Bakersfield) and a high ridership scenario of the Silicon Valley to Central Valley line for Existing (2015) and Phase 1 of Statewide High-Speed Rail Build Out (2040) years. All applicable scenarios are based on the level of ridership as presented in the Authority's *2016 Business*

Plan (Authority 2016). The tables in the effects analysis therefore present two values for operational emissions for each pollutant, corresponding to these two scenarios.

On-Road Vehicles

Analysts evaluated on-road vehicle emissions using average daily VMT estimates and associated average daily speed estimates for each affected county. Analysts estimated emission factors using the emission factors using the California Air Resources Board (CARB) emission factor program, Emission FACTors 2017 (EMFAC2017), which accounts for existing regulations that would reduce emissions, such as the Pavley Clean Car Standards. Parameters were set in the program for each individual county to reflect conditions within each county and statewide parameters to reflect travel through each county. The analysis was conducted for the following modeling years:

- Existing (Year 2015)
- Opening Year (Year 2029)
- Horizon Year (Year 2040)

To determine overall pollutant burdens generated by on-road vehicles, analysts multiplied the estimated VMT by the applicable pollutant's emission factors, which are based on speed, vehicle mix, and analysis year.

Aircraft

Analysts used the Federal Aviation Administration's Aviation Environmental Design Tool (AEDT) to estimate aircraft emissions. This tool estimates the emissions generated from specified numbers of landing and take-off cycles. Along with emissions from the aircraft themselves, emissions generated from associated ground maintenance requirements are included. Analysts calculated average aircraft emissions based on the profile of aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the HSR using the results of the travel demand modeling analyses conducted for the project section, based on the ridership estimates presented in the California High-Speed Rail Authority's *2016 Business Plan* (Authority 2016).

Power Plants

Analysts conservatively estimated the electrical demands caused by propulsion of the trains and the trains at terminal stations and in storage depots and maintenance facilities as part of the project section design. Analysts derived average emission factors for each kilowatt-hour required from CARB statewide emission inventories of electrical and cogeneration facilities data along with USEPA eGRID2018 (released 1/2020) electrical generation data. The energy estimates used in this analysis for the propulsion of the HSR include the use of regenerative brake power.

The HSR system is currently analyzed as if it would be powered by the state's current electric grid. This is a conservative assumption because of the state requirement that an increasing fraction of electricity (100 percent by 2045) generated for the state's power portfolio come from renewable energy sources. As such, the emissions generated for the HSR system are expected to be lower in the future than the

emissions estimated for this analysis. Furthermore, under the 2013 Policy Directive POLI-PLAN-03, the Authority has adopted a goal to purchase 100 percent of the HSR system's power from renewable energy sources.

Greenhouse Gas Analysis

As discussed in Section XX [of the EIR/EIS], Definition of Resource Study Area, the project section would reduce long-distance, city-to-city travel along freeways and highways throughout the state, as well as long-distance, city-to-city aircraft takeoffs and landings. The project section would also affect electricity demand throughout the state. These elements would affect GHG emissions in both the statewide and regional study areas. The methodology for estimating GHG emissions associated with operations of the project section is discussed below.

On-road Vehicle Emissions

Analysts conducted the on-road vehicle GHG emission analysis using the same methods and RSAs as described for air quality emission calculations in Section X, On-Road Vehicles.

Aircraft Emissions

Analysts calculated aircraft emissions by using the fuel consumption factors and emission factors from the CARB's 2000–2018 *Documentation of California's Greenhouse Gas Inventory (13th Edition)* and accompanying support documentation. The emission factor includes both landing and take-off and cruise operations (formula: aircraft emissions per flight = fuel consumption × emission factor; aircraft emissions = flights removed × aircraft emissions per flight). Analysts calculated average aircraft GHG emissions based on the profile of intrastate aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the project section through the travel demand modeling analysis conducted for the project section, based on the ridership estimates presented in the Authority's *2016 Business Plan* (Authority 2016).

Power Plant Emissions

The electrical demands due to propulsion of the trains, stations, storage depots and maintenance facilities were calculated as part of the project design. Average GHG emission factors for each kilowatt-hour required were derived from USEPA eGRID2018 electrical generation data. The energy estimates used in this analysis for the propulsion of the HSR include the use of regenerative brake power.

In addition, because of the state requirement that an increasing fraction (100 percent by 2045) of electricity generated for the state's power portfolio come from renewable energy sources, the emissions generated for the HSR system are expected to be lower in the future when compared to emissions estimated for this analysis.

Energy Analysis

As discussed in Section XX [of the EIR/EIS], Definition of Resource Study Area, the project section would reduce long-distance, city-to-city travel along freeways and highways throughout the state, as well as

long-distance, city-to-city aircraft takeoffs and landings. The project section would also affect electricity demand throughout the state. These elements would affect energy in both the statewide and regional study areas. The methodology for estimating energy associated with operation of the project section is discussed below.

On-road Vehicle Energy Usage

Analysts conducted the on-road vehicle energy analysis using the same inputs and RSAs as described for air quality emission calculations in Section X, Energy rates were determined through the use of carbon balance equations as recommended by CARB.

Aircraft Energy Usage

Analysts calculated aircraft energy use by using the fuel consumption factors from the CARB's 2000–2018 *Documentation of California's Greenhouse Gas Inventory (13th Edition)* and the accompanying technical support document. The energy use includes both landing and take-off and cruise operations (formula: aircraft energy per flight = fuel consumption × btu/gallon of fuel; aircraft energy = flights removed × aircraft energy per flight). Analysts calculated average aircraft energy based on the profile of intrastate aircraft currently servicing the San Francisco to Los Angeles corridor. Analysts estimated the number of air trips removed attributable to the project section through the travel demand modeling analysis conducted for the project section, based on the ridership estimates presented in the Authority's *2016 Business Plan* (Authority 2016).

Energy Usage

The electrical demands due to propulsion of the trains, stations, storage depots and maintenance facilities were calculated as part of the project design. Analysts estimated the energy use based on the ridership estimates and train operating characteristics as presented in the Authority's *2016 Business Plan* (Authority 2016).

Notes

¹ Following publication of the Palmdale to Burbank Project Section Draft EIR/EIS, on February 9, 2024, the Authority released its Draft 2024 Business Plan for a 60-day public review and comment period. The ridership estimates included in the updated plan are now lower than reported during the pandemic, primarily due to a decrease in California population projections. The Phase 1 medium ridership forecast for 2040 is now projected at 28.4 million, and the high ridership forecast is 30.6 million (2024 Draft Business Plan, p. 92). Even with this reduction in projected ridership, the Authority continues to conclude that building electrified high-speed rail in California remains economically beneficial.

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Segment Palmdale to Burbank
 GHG&Energy Report Tables

Input Year	2015
Project Build year base	2033

Input Energy Type	
Area	SC

Scenario:	Medium
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Source	County	Existing	EX + Project	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		Annual VMT	Annual VMT	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Roadway	LOS ANGELES	73,394,193,078	72,724,087,184	23.5	23.9	345,183,894.3	23.3	23.7	342,032,285.8	-0.2	-0.2	-3,151,608.5
	VENTURA	5,892,874,243	5,859,075,240	1.8	1.8	26,526,808.0	1.8	1.8	26,374,661.6	0.0	0.0	-152,146.4
	KERN	4,152,310,619	3,547,122,300	1.3	1.4	19,604,858.4	1.1	1.2	16,747,502.0	-0.2	-0.2	-2,857,356.4
	SANTA BARBARA	864,545,016	840,246,898	0.3	0.3	3,883,840.0	0.3	0.3	3,774,684.4	0.0	0.0	-109,155.7
	SAN BERNARDINO	12,725,201,965	12,665,228,642	3.8	3.9	56,038,415.0	3.8	3.9	55,774,308.4	0.0	0.0	-264,106.6
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regional Total		97,029,124,921	95,635,760,264	30.7	31.2	451,237,815.8	30.3	30.8	444,703,442.2	-0.4	-0.5	-6,534,373.6
Statewide Total		205,015,920,154	201,584,933,649	62.9	63.8	922,880,368.6	61.8	62.8	907,435,762.7	-1.1	-1.1	-15,444,605.9

Source	Area	Existing	EX + Project	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		# of Flights	# of Flights	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2015 Southern Cal	Southern California	107,915	73,378	0.9	0.9	12,947,020.2	0.6	0.6	8,803,488.3	-0.3	-0.3	-4,143,531.9
2015 Statewide	Statewide	268,567	188,430	2.3	2.3	32,221,206.1	1.6	1.6	22,606,829.5	-0.7	-0.7	-9,614,376.6

Source	Area	Existing	EX + Project	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
		Energy Use	Energy Use	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2033 Palmdale to Burbank	Palmdale to Burbank			N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	213,863.5
2033 Statewide	Statewide			N/A	N/A	N/A	N/A	N/A	N/A	0.4	0.4	5,346,587.7

Totals	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Regional	31.7	32.2	464,184,835.9	30.9	31.4	453,506,930.5	-0.7	-0.7	-10,464,042.0
Statewide	65.2	66.2	955,101,574.8	63.5	64.4	930,042,592.2	-1.4	-1.4	-19,712,394.9

Criteria Report Tables

Source	County	Existing	EX + Project	Total Existing Emissions (short tons/year)								Total Existing Plus Project Emissions (short tons/year)								Changes in Emissions (short tons/year)										
		Annual VMT	Annual VMT	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*
Roadway	LOS ANGELES	73,394,193,078	72,724,087,184	2,973	4,016	119,441	11,977	275	3,764	8,311	1,576	2,258	2,946	3,979	118,350	11,867	272	3,729	8,235	1,562	2,238	-27	-37	-1091	-109	-3	-34	-76	-14	-21
	VENTURA	5,892,874,243	5,859,075,240	225	304	9,317	959	22	302	668	126	181	224	302	9,264	954	22	301	664	125	180	-1	-2	-53	-6	0	-2	-4	-1	
	KERN	4,152,310,619	3,547,122,300	152	203	5,505	695	16	212	468	88	127	130	174	4,702	593	13	181	400	75	108	-22	-30	-802	-101	-2	-31	-68	-13	
	SANTA BARBARA	864,545,016	840,246,898	32	43	1,226	150	3	44	97	18	26	31	42	1,191	146	3	43	95	18	26	-1	-1	-34	-4	0	-1	-3	-1	
	SAN BERNARDINO	12,725,201,965	12,665,228,642	472	637	19,596	2,084	48	649	1,434	270	388	470	634	19,504	2,074	47	646	1,427	269	386	-2	-3	-92	-10	0	-3	-7	-1	
	Zero	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	
	Zero	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	
Regional Total		97,029,124,921	95,635,760,264	3,855	5,203	155,084	15,864	363	4,972	10,979	2,079	2,980	3,801	5,130	153,011	15,634	358	4,900	10,821	2,049	2,937	-54	-72	-2,073	-230	-5	-71	-157	-30	
Statewide Total		205,015,920,154	201,584,933,648.88	7,839	10,573	324,144	33,370	767	10,522	22,981	4,373	6,242	7,708	10,396	318,720	32,811	754	10,346	22,596	4,300	6,138	-131	-177	-5425	-558	-13	-176	-385	-73	

Source	Area	No Project	EX + Project	Total Existing Emissions (short tons/year)								Total Existing Plus Project Emissions (short tons/year)								Changes in Emissions (short tons/year)									
		# of Flights	# of Flights	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5
2015 Southern Cal	Southern California	107,915	73,378	136	137	1,161	1,116	120	34	34	34	34	92	93	789	759	82	23	23	23	23	-43	-44	-371	-357	-38	-11	-11	-11
2015 Statewide	Statewide	268,567	188,430	338	341	2,888	2,779	299	84	84	84	84	237	239	2,027	1,949	210	59	59	59	59	-101	-102	-862	-829	-89	-25	-25	

Source	Area	No Project	EX + Project	Total Existing Emissions (short tons/year)								Total Existing Plus Project Emissions (short tons/year)								Changes in Emissions (short tons/year)									
		Energy Use	Energy Use	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5
2033 Palmdale to Burbank	Palmdale to Burbank			357	2,357	2,665	2,386	142	417	417	414	414	357	2,362	2,673	2,390	142	418	418	415	415	1	4	9	4	1	1	1	1
2033 Statewide	Statewide			1,893	13,952	25,767	13,476	1,609	3,189	3,189	2,880	2,880	1,908	14,064	25,983	13,584	1,622	3,215	3,215	2,904	2,904	15	112	215	108	13	26	26	23

Total	Area	No Project	EX + Project	Total Existing Emissions (short tons/year)								Total Existing Plus Project Emissions (short tons/year)								Changes in Emissions (short tons/year)									
		Energy Use	Energy Use	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5
Regional				4,347	7,697	158,909	19,366	625	5,423	11,430	2,527	3,428	4,251	7,585	156,474	18,783	582	5,342	11,263	2,487	3,375	-97	-112	-2436	-583	-43	-81	-167	-40
Statewide				10,070	24,866	352,800	49,624	2,675	13,796	26,254	7,337	9,206	9,853	24,699	346,729	48,344	2,586	13,620	25,870	7,262	9,100	-217	-167	-6071	-1280	-89	-175	-384	-75

* With entrained roadway dust

Segment Palmdale to Burbank Input Year 2029 Input Energy Type ARB & eGRID Scenario: Medium

GHG&Energy Report Tables

Source	County	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		Annual VMT	Annual VMT	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Roadway	LOS ANGELES	83,292,097,055	82,912,308,772	16.6	16.9	250,815,302.0	16.5	16.8	249,671,655.6	-0.1	-0.1	-1,143,646.5
	VENTURA	6,958,738,851	6,938,712,330	1.3	1.4	20,347,897.4	1.3	1.4	20,289,338.3	0.0	0.0	-58,559.1
	KERN	4,885,345,714	4,494,669,973	1.0	1.0	15,041,654.7	0.9	0.9	13,838,790.1	-0.1	-0.1	-1,202,864.6
	SANTA BARBARA	981,913,675	965,944,500	0.2	0.2	2,906,995.2	0.2	0.2	2,859,717.8	0.0	0.0	-47,277.4
	SAN BERNARDINO	15,485,020,177	15,451,893,425	2.9	3.0	44,302,181.6	2.9	3.0	44,207,407.0	0.0	0.0	-94,774.6
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regional Total		111,603,115,472	110,763,529,001	22.1	22.4	333,414,031	21.9	22.3	330,866,909	-0.2	-0.2	-2,547,122.3
Statewide Total		240,475,748,703	238,209,151,397	46.9	47.6	708,228,579.1	46.5	47.2	701,553,190.9	-0.4	-0.4	-6,675,388.3

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		# of Flights	# of Flights	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2029 Southern Cal 2029 Statewide	Southern California	130,344	107,802	1.1	1.1	15,637,907.7	0.9	0.9	12,933,541.9	-0.2	-0.2	-2,704,365.8
	Statewide	329,614	277,475	2.9	2.9	39,545,267.7	2.4	2.4	33,289,981.2	-0.5	-0.5	-6,255,286.5

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
		Energy Use	Energy Use	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2029 Palmdale to Burbank 2029 Statewide	Palmdale to Burbank			N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	182,605.3
	Statewide			N/A	N/A	N/A	N/A	N/A	N/A	0.3	0.3	4,565,133.4

Totals	Total No Build Emissions			Total Build Emissions			Changes in Emissions		
	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Regional	23.2	23.6	349,051,938.7	22.9	23.2	343,800,450.7	-0.4	-0.4	-5,068,882.7
Statewide	49.8	50.5	747,773,846.8	48.9	49.6	734,843,172.0	-0.6	-0.6	-8,365,541.4

Criteria Report Tables

Source	County	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)											
		Annual VMT	Annual VMT	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	
Roadway	LOS ANGELES	83,292,097,055	82,912,308,772	619	901	44,582	3,415	200	4,061	9,221	1,669	2,443	616	897	44,378	3,400	199	4,042	9,179	1,661	2,432	-3	-4	-203	-16	-1	-19	-42	-8	-11	
	VENTURA	6,958,738,851	6,938,712,330	49	71	3,582	283	17	339	771	139	204	49	71	3,572	282	17	338	768	139	203	0	0	-10	-1	0	-1	-2	0	-1	
	KERN	4,885,345,714	4,494,669,973	32	46	1,982	196	12	238	539	97	143	29	43	1,824	181	11	219	496	90	131	-3	-4	-159	-16	-1	-19	-43	-8	-11	
	SANTA BARBARA	981,913,675	965,944,500	7	10	426	40	2	50	110	20	29	6	9	419	40	2	49	108	20	29	0	0	-7	-1	0	-1	-2	0	0	
	SAN BERNARDINO	15,485,020,177	15,451,893,425	104	151	7,669	626	37	783	1,737	321	464	104	151	7,653	625	37	781	1,734	320	463	0	0	-16	-1	0	-2	-4	-1	-1	
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Regional Total		111,603,115,472	110,763,529,001	810	1,179	58,242	4,561	268	5,470	12,379	2,246	3,283	804	1,171	57,846	4,527	266	5,429	12,286	2,229	3,258	-6	-9	-395	-34	-2	-41	-93	-17	-25	
Statewide Total		240,475,748,703	238,209,151,397	1,712	2,493	125,365	9,783	577	11,709	26,322	4,805	6,998	1,696	2,470	124,183	9,691	571	11,599	26,074	4,760	6,932	-16	-23	-1182	-92	-5	-110	-248	-45	-66	
2029 Southern Cal 2029 Statewide	Southern California	130,344	107,802	163	164	1,362	1,341	145	41	41	40	40	135	136	1,127	1,109	120	34	34	33	33	-28	-28	-236	-232	-25	-7	-7	-7	-7	
	Statewide	329,614	277,475	411	415	3,445	3,391	367	103	103	102	102	346	350	2,900	2,855	309	86	86	86	86	-65	-66	-545	-536	-58	-16	-16	-16	-16	
2029 Palmdale to Burbank 2029 Statewide	Palmdale to Burbank			382	2,524	2,907	1,285	145	450	450	447	447	383	2,528	2,914	1,288	146	451	451	447	447	0.5	3.8	7.4	3.7	0.4	0.9	0.9	0.8	0.8	
	Statewide			2,310	16,107	34,760	14,890	1,936	3,807	3,807	3,442	3,442	2,323	16,203	34,944	14,982	1,947	3,829	3,829	3,462	3,462	13.1	95.7	183.8	92.0	11.1	22.2	22.2	20.1	20.1	
Total	Area	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)											
		Energy Use	Energy Use	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	
	Regional			1,355	3,868	62,511	7,186	558	5,960	12,869	2,733	3,770	1,321	3,835	61,887	6,924	531	5,913	12,770	2,710	3,739	-33	-33	-624	-262	-27	-47	-99	-23	-31	
	Statewide			4,434	19,015	163,570	28,064	2,880	15,619	30,232	8,349	10,542	4,366	19,022	162,027	27,527	2,827	15,514	29,989	8,308	10,480	-68	7	-1543	-537	-52	-104	-242	-41	-62	

* With entrained roadway dust

Segment Palmdale to Burbank Input Year 2040 Input Energy Type ARB & eGRID Scenario: Medium

GHG&Energy Report Tables

Source	County	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		Annual VMT	Annual VMT	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Roadway	LOS ANGELES	86,055,909,405	85,124,593,011	14.5	14.7	221,932,144.1	14.4	14.6	219,530,344.5	-0.2	-0.2	-2,401,799.5
	VENTURA	7,085,588,919	7,038,614,902	1.2	1.2	18,012,997.3	1.2	1.2	17,893,579.8	0.0	0.0	-119,417.4
	KERN	5,789,706,865	4,948,613,229	1.0	1.0	15,401,273.6	0.9	0.9	13,163,869.6	-0.1	-0.1	-2,237,404.0
	SANTA BARBARA	1,038,912,666	1,005,143,024	0.2	0.2	2,691,214.4	0.2	0.2	2,603,737.1	0.0	0.0	-87,477.4
	SAN BERNARDINO	18,495,252,023	18,411,900,811	3.0	3.1	46,333,883.5	3.0	3.1	46,125,073.9	0.0	0.0	-208,809.6
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regional Total		118,465,369,878	116,528,864,976	19.9	20.2	304,371,512.9	19.6	19.9	299,316,605	-0.3	-0.3	-5,054,907.9
Statewide Total		261,252,464,970	256,484,063,423	43.5	44.1	664,156,499.6	43.0	43.6	656,744,319.7	-0.5	-0.5	-7,412,179.9

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		# of Flights	# of Flights	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2040 Southern Cal	Planes											
	Southern California	149,961	101,962	1.3	1.3	17,991,503.2	0.9	0.9	12,232,802.6	-0.4	-0.4	-5,758,700.6
2040 Statewide	Statewide	380,189	268,814	3.3	3.3	45,612,947.3	2.3	2.3	32,250,840.4	-1.0	-1.0	-13,362,106.9

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU				
		Energy Use	Energy Use	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy		
2040 Palmdale to B	Energy - ARB & e	Palmdale to Burbank			N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	213,863.5
2040 Statewide	Statewide				N/A	N/A	N/A	N/A	N/A	N/A	N/A	0.4	0.4	5,346,587.7

Totals	Total No Build Emissions			Total Build Emissions			Changes in Emissions		
	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Regional	21.2	21.5	322,363,016.0	20.5	20.8	311,549,407.6	-0.7	-0.7	-10,599,744.9
Statewide	46.8	47.5	709,769,446.8	45.3	46.0	688,995,160.0	-1.1	-1.1	-15,427,699.1

Criteria Report Tables

Source	County	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)											
		Annual VMT	Annual VMT	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	
Roadway	LOS ANGELES	86,055,909,405	85,124,593,011	357	519	30,726	2,208	176	4,082	9,414	1,649	2,449	353	514	30,394	2,184	174	4,038	9,312	1,631	2,423	-4	-6	-333	-24	-2	-44	-102	-18	-27	
	VENTURA	7,085,588,919	7,038,614,902	29	42	2,471	181	14	336	776	136	202	29	42	2,455	180	14	334	771	135	200	0	0	-16	-1	0	-2	-5	-1	-1	
	KERN	5,789,706,865	4,948,613,229	22	32	1,630	144	12	274	632	111	164	19	27	1,393	123	10	235	540	95	141	-3	-5	-237	-21	-2	-40	-92	-16	-24	
	SANTA BARBARA	1,038,912,666	1,005,143,024	4	6	305	26	2	52	116	21	31	4	6	295	25	2	50	112	20	30	0	0	-10	-1	0	-2	-4	-1	-1	
	SAN BERNARDINO	18,495,252,023	18,411,900,811	73	106	6,223	473	38	876	2,016	354	525	73	106	6,195	471	38	872	2,007	352	522	0	0	-28	-2	0	-4	-9	-2	-2	
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Regional Total		118,465,369,878	116,528,864,976	485	705	41,356	3,032	242	5,621	12,954	2,270	3,370	477	694	40,732	2,983	238	5,529	12,742	2,233	3,315	-8	-11	-624	-49	-4	-92	-212	-37	-55	
Statewide Total		261,252,464,970	256,484,063,423	1,059	1,541	91,121	6,688	534	12,386	28,262	5,001	7,383	1,052	1,530	90,518	6,573	525	12,163	27,749	4,913	7,251	-7	-10	-603	-115	-10	-223	-513	-89	-132	
2040 Southern Cal	Planes																														
	Southern California	149,961	101,962	187	189	1,565	1,541	167	47	47	46	46	127	128	1,064	1,048	114	32	32	32	32	-60	-60	-501	-493	-53	-15	-15	-15	-15	
2040 Statewide	Statewide	380,189	268,814	474	479	3,968	3,908	423	118	118	118	118	335	338	2,805	2,763	299	84	84	83	83	-139	-140	-1162	-1145	-124	-35	-35	-35	-35	
2040 Palmdale to B	Energy																														
	Palmdale to Burbank			385	2,547	2,950	1,288	147	455	455	452	452	385	2,551	2,959	1,293	147	456	456	453	453	0.6	4.5	8.6	4.3	0.5	1.0	1.0	0.9	0.9	
2040 Statewide	Statewide			2,579	17,449	39,173	16,080	2,104	4,082	4,082	3,686	3,686	2,594	17,561	39,388	16,188	2,117	4,108	4,108	3,710	3,710	15.4	112.1	215.3	107.7	13.0	26.0	26.0	23.5	23.5	
Total	Regional			1,056	3,441	45,871	5,862	556	6,123	13,456	2,769	3,869	989	3,373	44,755	5,324	499	6,017	13,230	2,718	3,800	-67	-67	-1116	-538	-57	-106	-226	-51	-69	
	Statewide			4,112	19,469	134,261	26,676	3,062	16,587	32,463	8,805	11,187	3,981	19,430	132,711	25,523	2,941	16,355	31,941	8,706	11,044	-131	-39	-1550	-1152	-121	-232	-522	-100	-143	

* With entrained roadway dust

Segment Palmdale to Burbank
 GHG&Energy Report Tables

Input Year	2015
Project Build year base	2033

Input Energy Type	ARB & eGRID
Area	SC

Scenario: High Scenario

Source	County	Existing	EX + Project	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		Annual VMT	Annual VMT	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Roadway	LOS ANGELES	73,236,845,700	72,310,888,632	23.5	23.8	344,443,866.0	23.2	23.5	340,088,951.1	-0.3	-0.3	-4,354,914.9
	VENTURA	5,871,995,391	5,823,357,866	1.8	1.9	26,827,506.1	1.8	1.8	26,605,294.8	0.0	0.0	-222,211.3
	KERN	4,094,480,903	3,267,281,332	1.3	1.3	19,331,819.3	1.1	1.1	15,426,251.5	-0.3	-0.3	-3,905,567.8
	SANTA BARBARA	849,400,023	814,378,660	0.3	0.3	3,815,803.4	0.2	0.3	3,658,475.1	0.0	0.0	-157,328.3
	SAN BERNARDINO	12,686,260,346	12,601,481,161	3.8	3.9	55,866,926.4	3.8	3.8	55,493,581.4	0.0	0.0	-373,345.1
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regional Total		96,738,982,363	94,817,387,651	30.7	31.2	450,285,921.2	30.1	30.5	441,272,553.9	-0.6	-0.6	-9,013,367.3
Statewide Total		203,997,417,634	199,280,213,986	62.6	63.5	918,295,573.5	61.1	62.0	897,061,053.6	-1.4	-1.5	-21,234,519.9

Source	Area	Existing	EX + Project	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		# of Flights	# of Flights	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2015 Southern Cal 2015 Statewide	Southern California	100,674	68,130	0.9	0.9	12,078,342.6	0.6	0.6	8,173,881.8	-0.3	-0.3	-3,904,460.8
	Statewide	250,276	173,177	2.2	2.2	30,026,781.4	1.5	1.5	20,776,778.4	-0.7	-0.7	-9,250,003.0

Source	Area	Existing	EX + Project	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
		Energy Use	Energy Use	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2033 Palmdale to Burbank 2033 Statewide	Palmdale to Burbank			N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	-235,249.9
	Statewide			N/A	N/A	N/A	N/A	N/A	N/A	0.4	0.4	-5,881,246.4

Totals	Total Existing Emissions (million metric tons/year), MMBTU			Total Existing Plus Project Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Regional	31.6	32.0	462,364,263.8	30.7	31.1	449,446,435.7	-0.9	-0.9	-12,682,578.2
Statewide	64.7	65.7	948,322,354.9	62.6	63.6	917,837,832.0	-1.7	-1.8	-24,603,276.5

Criteria Report Tables

Source	County	Existing	EX + Project	Total Existing Emissions (short tons/year)								Total Existing Plus Project Emissions (short tons/year)								Changes in Emissions (short tons/year)										
		Annual VMT	Annual VMT	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*
Roadway	LOS ANGELES	73,236,845,700	72,310,888,632	2,967	4,007	119,185	11,951	274	3,756	8,293	1,573	2,254	2,930	3,957	117,678	11,800	270	3,708	8,188	1,553	2,225	-38	-51	-1507	-151	-3	-47	-105	-20	-28
	VENTURA	5,871,995,391	5,823,357,866	229	309	9,375	957	22	300	665	126	180	227	306	9,297	949	22	298	660	124	179	-2	-3	-78	-8	0	-2	-6	-1	
	KERN	4,094,480,903	3,267,281,332	150	200	5,428	685	15	209	462	87	125	120	160	4,331	546	12	167	369	69	100	-30	-40	-1097	-138	-3	-42	-93	-18	-25
	SANTA BARBARA	849,400,023	814,378,660	32	42	1,204	147	3	43	96	18	26	30	41	1,154	141	3	42	92	17	25	-1	-2	-50	-6	0	-2	-4	-1	
	SAN BERNARDINO	12,686,260,346	12,601,481,161	471	635	19,536	2,077	47	647	1,429	270	387	468	630	19,406	2,064	47	643	1,420	268	384	-3	-4	-131	-14	0	-4	-10	-2	
	Zero	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	
	Zero	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0	0	0	0	0	0	0	0	
Regional Total		96,738,982,363	94,817,387,651	3,848	5,194	154,728	15,817	362	4,956	10,945	2,073	2,971	3,774	5,094	151,866	15,500	355	4,858	10,728	2,032	2,912	-74	-100	-2,861	-317	-7	-98	-217	-41	-59
Statewide Total		203,997,417,634	199,280,213,986	7,800	10,520	322,534	33,204	763	10,470	22,867	4,351	6,211	7,620	10,277	315,076	32,436	745	10,228	22,338	4,250	6,067	-180	-243	-7458	-768	-18	-242	-529	-101	-144
2015 Southern Cal 2015 Statewide	Southern California	100,674	68,130	127	128	1,083	1,042	112	31	31	31	31	86	87	733	705	76	21	21	21	21	-41	-41	-350	-337	-36	-10	-10	-10	
	Statewide	250,276	173,177	315	318	2,692	2,589	279	78	78	78	78	218	220	1,863	1,792	193	54	54	54	54	-97	-98	-829	-798	-86	-24	-24	-24	
2033 Palmdale to Burbank 2033 Statewide	Palmdale to Burbank			357	2,357	2,665	2,386	142	417	417	414	414	357	2,362	2,674	2,391	142	418	418	415	415	1	5	9	5	1	1	1	1	
	Statewide			1,893	13,952	25,767	13,476	1,609	3,189	3,189	2,880	2,880	1,910	14,075	26,004	13,594	1,624	3,218	3,218	2,906	2,906	17	123	237	118	14	29	29	26	
Total	Regional			4,331	7,679	158,475	19,244	616	5,405	11,394	2,519	3,417	4,217	7,543	155,273	18,595	573	5,297	11,168	2,468	3,349	-114	-136	-3202	-649	-43	-107	-226	-50	-68
	Statewide			10,008	24,790	350,993	49,269	2,651	13,738	26,134	7,310	9,170	9,747	24,572	342,942	47,822	2,562	13,500	25,610	7,211	9,028	-260	-218	-8051	-1447	-89	-238	-524	-99	-142

* With entrained roadway dust

Segment Palmdale to Burbank Input Year 2029 Input Energy Type ARB & eGRID Scenario: High Scenario

GHG&Energy Report Tables

Source	County	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		Annual VMT	Annual VMT	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Roadway	LOS ANGELES	84,124,984,453	83,596,457,306	16.8	17.0	253,323,354.0	16.7	16.9	251,731,814.1	-0.1	-0.1	-1,591,539.9
	VENTURA	7,053,048,744	7,024,064,519	1.4	1.4	20,623,666.9	1.4	1.4	20,538,914.8	0.0	0.0	-84,752.1
	KERN	5,435,876,058	4,895,234,851	1.1	1.1	16,736,701.1	1.0	1.0	15,072,102.7	-0.1	-0.1	-1,664,598.3
	SANTA BARBARA	1,054,058,771	1,030,577,339	0.2	0.2	3,120,583.7	0.2	0.2	3,051,066.0	0.0	0.0	-69,517.7
	SAN BERNARDINO	15,653,692,190	15,606,876,889	3.0	3.0	44,784,747.2	3.0	3.0	44,650,810.0	0.0	0.0	-133,937.2
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regional Total		113,321,660,216	112,153,210,903	22.4	22.8	338,589,053	22.2	22.5	335,044,708	-0.2	-0.2	-3,544,345.3
Statewide Total		245,782,498,313	242,644,922,069	47.6	48.3	718,687,274.9	47.3	48.1	714,617,042.7	-0.3	-0.3	-4,070,232.2

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		# of Flights	# of Flights	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2029 Southern Cal	Southern California	107,443	82,707	0.9	0.9	12,890,374.5	0.7	0.7	9,922,688.0	-0.2	-0.2	-2,967,686.4
2029 Statewide	Statewide	273,240	215,599	2.4	2.4	32,781,890.3	1.9	1.9	25,866,435.3	-0.5	-0.5	-6,915,455.0

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
		Energy Use	Energy Use	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2029 Palmdale to Burbank	Palmdale to Burbank			N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	200,865.9
2029 Statewide	Statewide			N/A	N/A	N/A	N/A	N/A	N/A	0.3	0.3	5,021,644.7

Totals	Total No Build Emissions			Total Build Emissions			Changes in Emissions		
	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Regional	23.4	23.7	351,479,427.3	22.9	23.3	344,967,395.6	-0.4	-0.4	-6,511,165.9
Statewide	50.0	50.7	751,469,165.2	49.2	49.9	740,483,478.1	-0.4	-0.4	-5,964,040.5

Criteria Report Tables

Source	County	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)										
		Annual VMT	Annual VMT	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*
Roadway	LOS ANGELES	84,124,984,453	83,596,457,306	625	910	45,028	3,449	202	4,101	9,314	1,686	2,468	621	904	44,745	3,428	201	4,076	9,255	1,675	2,452	-4	-6	-283	-22	-1	-26	-59	-11	-16
	VENTURA	7,053,048,744	7,024,064,519	50	72	3,631	286	17	343	781	141	206	49	72	3,616	285	17	342	778	140	206	0	0	-15	-11	0	-1	-3	-1	
	KERN	5,435,876,058	4,895,234,851	36	52	2,206	219	13	264	600	108	159	32	47	1,986	197	12	238	541	98	143	-4	-5	-219	-22	-1	-26	-60	-11	
	SANTA BARBARA	1,054,058,771	1,030,577,339	7	10	457	43	3	53	118	22	32	7	10	447	42	2	52	115	21	31	0	0	-10	-1	0	-1	-3	0	
	SAN BERNARDINO	15,653,692,190	15,606,876,889	105	153	7,753	633	38	792	1,756	324	469	105	153	7,730	631	37	789	1,751	323	467	0	0	-23	-2	0	-2	-5	-1	
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Regional Total		113,321,660,216	112,153,210,903	822	1,197	59,074	4,631	272	5,554	12,569	2,281	3,333	814	1,185	58,524	4,583	269	5,497	12,440	2,257	3,299	-8	-12	-551	-47	-3	-57	-129	-23	
Statewide Total		245,782,498,313	242,644,922,069	1,725	2,512	126,531	9,983	590	11,962	26,898	4,906	7,147	1,728	2,516	126,496	9,872	582	11,815	26,560	4,848	7,061	3	4	-35	-111	-8	-147	-338	-58	

Source	Area	No Project	Full Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)									
		# of Flights	# of Flights	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5
2029 Southern Cal	Southern California	107,443	82,707	134	135	1,123	1,105	120	33	33	33	33	103	104	864	851	92	26	26	26	26	-31	-31	-259	-254	-28	-8	-8	-8
2029 Statewide	Statewide	273,240	215,599	341	344	2,856	2,811	304	85	85	85	85	269	272	2,253	2,218	240	67	67	67	67	-72	-73	-602	-593	-64	-18	-18	

Source	Area	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)									
		Energy Use	Energy Use	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5
2029 Palmdale to Burbank	Palmdale to Burbank			382	2,524	2,907	1,285	145	450	450	447	447	383	2,528	2,915	1,289	146	451	451	448	448	0.6	4.2	8.1	4.0	0.5	1.0	1.0	0.9
2029 Statewide	Statewide			2,310	16,107	34,760	14,890	1,936	3,807	3,807	3,442	3,442	2,325	16,212	34,962	14,991	1,948	3,831	3,831	3,464	3,464	14.4	105.3	202.2	101.2	12.3	24.4	24.4	

Total	Area	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)									
		Energy Use	Energy Use	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5
Regional				1,338	3,856	63,104	7,021	537	6,037	13,052	2,761	3,813	1,300	3,818	62,303	6,723	507	5,973	12,916	2,730	3,772	-38	-39	-801	-298	-30	-64	-136	-30
Statewide				4,377	18,963	164,146	27,684	2,830	15,854	30,789	8,433	10,674	4,322	19,000	163,711	27,080	2,770	15,713	30,458	8,379	10,592	-55	36	-435	-603	-59	-141	-332	-54

* With entrained roadway dust

Segment Palmdale to Burbank Input Year 2040 Input Energy Type ARB & eGRID Scenario: High Scenario

GHG&Energy Report Tables

Source	County	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		Annual VMT	Annual VMT	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Roadway	LOS ANGELES	87,075,870,799	85,788,971,213	14.7	14.9	224,562,552.8	14.5	14.7	221,243,729.2	-0.2	-0.2	-3,318,823.6
	VENTURA	7,181,701,297	7,114,104,631	1.2	1.2	18,125,449.9	1.2	1.2	18,085,489.9	0.0	0.0	-39,960.0
	KERN	6,659,048,685	5,509,402,743	1.2	1.2	17,713,821.0	1.0	1.0	14,655,633.0	-0.2	-0.2	-3,058,187.9
	SANTA BARBARA	1,117,778,105	1,069,105,246	0.2	0.2	2,895,508.6	0.2	0.2	2,769,425.7	0.0	0.0	-126,082.9
	SAN BERNARDINO	18,770,247,920	18,652,421,401	3.1	3.1	47,022,796.9	3.1	3.1	46,727,620.6	0.0	0.0	-295,176.3
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Zero	-	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Regional Total		120,804,646,808	118,134,005,234	20.3	20.6	310,320,129.3	19.9	20.2	303,481,899	-0.4	-0.5	-6,838,230.8
Statewide Total		269,784,125,131	263,228,132,814	44.9	45.6	685,845,701.8	43.8	44.5	669,179,046.0	-1.1	-1.1	-16,666,655.8

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes Emissions (million metric tons/year), MMBTU		
		# of Flights	# of Flights	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2040 Southern California	Southern California	162,667	117,437	1.4	1.4	19,515,858.8	1.0	1.0	14,089,420.5	-0.4	-0.4	-5,426,438.4
2040 Statewide	Statewide	416,659	309,505	3.6	3.6	49,988,443.2	2.7	2.7	37,132,744.5	-0.9	-0.9	-12,855,698.6

Source	Area	No Project	Build	Total No Build Emissions (million metric tons/year), MMBTU			Total Build Emissions (million metric tons/year), MMBTU			Changes in Emissions (million metric tons/year), MMBTU		
		Energy Use	Energy Use	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
2040 Palmdale to Burbank	Palmdale to Burbank			N/A	N/A	N/A	N/A	N/A	N/A	0.0	0.0	235,249.9
2040 Statewide	Statewide			N/A	N/A	N/A	N/A	N/A	N/A	0.4	0.390	5,881,246.4

Totals	Total No Build Emissions			Total Build Emissions			Changes in Emissions		
	CO2	CO2e	Energy	CO2	CO2e	Energy	CO2	CO2e	Energy
Regional	21.7	22.0	329,835,988.1	20.9	21.2	317,571,319.0	-0.8	-0.8	-12,029,419.2
Statewide	48.5	49.2	735,834,145.0	46.5	47.2	706,311,790.6	-1.6	-1.7	-23,641,108.0

Criteria Report Tables

Source	County	No Project	Build	Total No Build Emissions (short tons/year)								Total Build Emissions (short tons/year)								Changes in Build Emissions (short tons/year)										
		Annual VMT	Annual VMT	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*	ROG	TOG	CO	NOX	SO2	PM10	PM10*	PM2.5	PM2.5*
Roadway	LOS ANGELES	87,075,870,799	85,788,971,213	361	526	31,091	2,234	178	4,130	9,526	1,669	2,478	356	518	30,631	2,201	175	4,069	9,385	1,644	2,442	-5	-8	-459	-33	-3	-61	-141	-25	-37
	VENTURA	7,181,701,297	7,114,104,631	29	42	2,475	184	15	340	786	137	204	29	42	2,481	182	15	337	779	136	202	0	0	6	-2	0	-3	-7	-1	-2
	KERN	6,659,048,685	5,509,402,743	25	37	1,874	166	14	316	727	127	189	21	30	1,551	137	11	261	602	105	156	-4	-6	-324	-29	-2	-54	-126	-22	-33
	SANTA BARBARA	1,117,778,105	1,069,105,246	4	6	328	28	2	56	125	23	33	4	6	314	27	2	53	119	22	31	0	0	-14	-1	0	-2	-5	-1	-1
	SAN BERNARDINO	18,770,247,920	18,652,421,401	74	108	6,316	480	38	889	2,046	359	532	74	107	6,276	477	38	884	2,033	357	529	0	-1	-40	-3	0	-6	-13	-2	-3
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Zero	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Regional Total		120,804,646,808	118,134,005,234	493	718	42,084	3,091	247	5,732	13,210	2,315	3,437	483	703	41,253	3,024	242	5,605	12,918	2,264	3,361	-10	-15	-831	-67	-5	-127	-292	-51	-76
Statewide Total		269,784,125,131	263,228,132,814	1,093	1,591	94,097	6,907	552	12,791	29,185	5,165	7,625	1,067	1,552	91,810	6,739	538	12,480	28,476	5,039	7,439	-27	-39	-2,287	-168	-13	-311	-709	-126	-185
2040 Southern California	Southern California	162,667	117,437	203	205	1,698	1,672	181	51	51	50	50	147	148	1,226	1,207	131	36	36	36	36	-56	-57	-472	-465	-50	-14	-14	-14	-14
	Statewide	416,659	309,505	520	525	4,348	4,282	464	129	129	129	129	386	390	3,230	3,181	345	96	96	96	96	-134	-135	-1,118	-1,101	-119	-33	-33	-33	
2040 Palmdale to Burbank	Palmdale to Burbank			385	2,547	2,950	1,288	147	455	455	452	452	385	2,552	2,960	1,293	147	456	456	453	453	0.7	4.9	9.5	4.7	0.6	1.1	1.1	1.0	1.0
	Statewide			2,579	17,449	39,173	16,080	2,104	4,082	4,082	3,686	3,686	2,596	17,573	39,409	16,198	2,118	4,111	4,111	3,712	3,712	16.9	123.3	236.8	118.5	14.3	28.6	28.6	25.8	25.8
Total	Regional			1,081	3,470	46,732	6,051	575	6,238	13,715	2,818	3,940	1,015	3,403	45,439	5,524	520	6,098	13,411	2,754	3,851	-66	-67	-1,293	-528	-55	-140	-305	-64	-89
	Statewide			4,192	19,565	137,618	27,269	3,120	17,003	33,397	8,980	11,440	4,049	19,515	134,450	26,118	3,001	16,687	32,683	8,847	11,247	-143	-50	-3,168	-1,151	-118	-316	-714	-133	-193

* With entrained roadway dust