

# Appendix E

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Mobile Energy Calculations

## Energy Calculations Summary

### Operational Fuel Use Summary

<b>Fuel Type</b>	<b>Fleet Mix (%)</b>	<b>Gallons per Mile</b>	<b>Annual VMT</b>	<b>Gallons</b>
Gasoline	97.15%	0.04	260,611	9,412
Diesel	2.85%	0.10		711

#### Notes:

1. Fleet mix calculated from CalEEMod default values.
2. Gallons per mile calculated from EMFAC 2017.
3. Annual VMT obtained from CalEEMod output file.

**Energy Calculations Summary**

**Construction Fuel Usage Summary**

	Diesel	Gasoline	Diesel	
Construction Year	Off-road Equipment (gallons)	On-road (gallons)	On-road (gallons)	Combined
2020	23,876	1,359	4,500	
2021		15,013	8,896	
2022		14,548	4,356	
2023		13,053	4,143	
<b>TOTAL</b>		<b>23,876</b>	<b>43,973</b>	<b>21,895</b>

<b>Total Gasoline</b>	<b>43,973</b>	<b>gallons</b>
<b>Total Diesel</b>	<b>45,771</b>	<b>gallons</b>

Land Use	Natural Gas <sup>1</sup> kBTU/year	Natural Gas <sup>1</sup> therm/year	Electricity <sup>2</sup> kWh/year	Diesel gallons/year
Government Office Building	1,236,310	0.012	2.38E+06	9,537
<b>Total</b>	<b>1,236,310</b>	<b>0.012</b>	<b>2,376,820</b>	<b>9,537</b>

btu/therm 1.00E-05

<sup>1</sup> No direct natural gas use. Output from CalEEMod.

<sup>2</sup> Electricity offset by 100% renewable energy.

Equipment	Amount	Usage Hours/yr	Horse Power	Load Factor	Average Daily Factor	Diesel Fuel Usage
Emergency Generator	1	500.00	871	0.73	0.6	9,537

EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: County

Region: SACRAMENTO

Calendar Year: 2024

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed miles/hr	Fuel	Population vehicles	VMT miles/day	Trips trips/day	Gasoline Fuel	Diesel Fuel		
									Consumption 1,000 gallons/day	Consumption 1,000 gallons/day		
SACRAMEI	2024	All Other Buses	Aggregate	Aggregate	DSL	437.2760982	23185.34538	3673.119225	0	2.490775991		
SACRAMEI	2024	LDA	Aggregate	Aggregate	GAS	621184.5373	21791121.19	2906212.223	656.5160125	0		
SACRAMEI	2024	LDA	Aggregate	Aggregate	DSL	6304.422337	224625.5875	29452.21692	0	4.193102239		
SACRAMEI	2024	LDA	Aggregate	Aggregate	ELEC	14401.50424	606697.2257	71494.39671	0	0		
SACRAMEI	2024	LDT1	Aggregate	Aggregate	GAS	66406.62237	2167045.803	302428.5847	76.58153967	0.00		
SACRAMEI	2024	LDT1	Aggregate	Aggregate	DSL	155.5559285	2531.091863	558.9087838	0	0.114799994		
SACRAMEI	2024	LDT1	Aggregate	Aggregate	ELEC	659.04866	28091.44558	3276.773077	0	0		
SACRAMEI	2024	LDT2	Aggregate	Aggregate	GAS	213508.8296	7147811.653	985234.2998	269.9971475	0.00		
SACRAMEI	2024	LDT2	Aggregate	Aggregate	DSL	1356.311823	52866.74641	6603.512714	0	1.338876831		
SACRAMEI	2024	LDT2	Aggregate	Aggregate	ELEC	2557.306168	79919.49172	12842.15287	0	0		
SACRAMEI	2024	LHD1	Aggregate	Aggregate	GAS	16148.68105	520461.6574	240591.2861	61.1965833	0.00		
SACRAMEI	2024	LHD1	Aggregate	Aggregate	DSL	14131.97513	472339.8454	177762.4691	0	25.62710815		
SACRAMEI	2024	LHD2	Aggregate	Aggregate	GAS	2236.898397	73166.69887	33326.45314	9.81533138	0.00		
SACRAMEI	2024	LHD2	Aggregate	Aggregate	DSL	4848.999904	165824.487	60994.31875	0	10.05130996		
SACRAMEI	2024	MCY	Aggregate	Aggregate	GAS	30709.38003	203163.0217	61418.76007	5.426202322	0.00		
SACRAMEI	2024	MDV	Aggregate	Aggregate	GAS	150017.7792	4701204.899	680651.5265	218.7063409	0.00		
SACRAMEI	2024	MDV	Aggregate	Aggregate	DSL	3405.597163	126439.0711	16336.56875	0	4.256688934		
SACRAMEI	2024	MDV	Aggregate	Aggregate	ELEC	1516.399991	48571.70556	7673.853607	0	0.00		
SACRAMEI	2024	MH	Aggregate	Aggregate	GAS	2880.979362	24624.58787	288.2131753	5.025871689	0.00		
SACRAMEI	2024	MH	Aggregate	Aggregate	DSL	1083.677135	9270.538143	108.3677135	0	0.928207266		
SACRAMEI	2024	Motor Coach	Aggregate	Aggregate	DSL	102.9100332	14328.07119	1502.486485	0	2.173678986		
SACRAMEI	2024	OBUS	Aggregate	Aggregate	GAS	544.9957027	22876.14392	10904.27402	4.765749036	0.00		
SACRAMEI	2024	PTO	Aggregate	Aggregate	DSL	0	23625.91986	0	0	4.308841426		
SACRAMEI	2024	SBUS	Aggregate	Aggregate	GAS	133.3686494	6358.180942	533.4745975	0.652551399	0.00		
SACRAMEI	2024	SBUS	Aggregate	Aggregate	DSL	1029.485742	32124.91948	11880.12273	0	3.986527652		
SACRAMEI	2024	T6 Ag	Aggregate	Aggregate	DSL	16.10352979	179.2582109	70.85553107	0	0.019732041		
SACRAMEI	2024	T6 CAIRP heavy	Aggregate	Aggregate	DSL	116.9446044	2282.86264	1707.391224	0	1.864209457		
SACRAMEI	2024	T6 CAIRP small	Aggregate	Aggregate	DSL	63.99178486	3260.986193	934.2800589	0	0.29340335		
SACRAMEI	2024	T6 instate construction he	Aggregate	Aggregate	DSL	209.8382818	13682.45728	948.6707136	0	1.585017446		
SACRAMEI	2024	T6 instate construction sm	Aggregate	Aggregate	DSL	1826.726911	100379.0573	8258.561341	0	11.539671137		
SACRAMEI	2024	T6 instate heavy	Aggregate	Aggregate	DSL	1456.552465	191517.8246	16808.4135	0	17.77432179		
SACRAMEI	2024	T6 instate small	Aggregate	Aggregate	DSL	5235.230028	261799.854	60413.82868	0	25.7678568		
SACRAMEI	2024	T6 OOS heavy	Aggregate	Aggregate	DSL	65.61671482	12461.81247	958.0040363	0	1.043501946		
SACRAMEI	2024	T6 OOS small	Aggregate	Aggregate	DSL	34.72335518	1749.967254	506.9609857	0	0.157897141		
SACRAMEI	2024	T6 Public	Aggregate	Aggregate	DSL	4474.525761	69974.64776	13572.72813	0	9.171783606		
SACRAMEI	2024	T6 utility	Aggregate	Aggregate	DSL	177.6332516	2965.810086	2042.782394	0	0.311794166		
SACRAMEI	2024	T6TS	Aggregate	Aggregate	GAS	2018.783503	94274.66572	40391.82033	19.47151244	0		
SACRAMEI	2024	T7 Ag	Aggregate	Aggregate	DSL	13.18975118	134.4552151	58.0349052	0	0.024165718		
SACRAMEI	2024	T7 CAIRP	Aggregate	Aggregate	DSL	863.3963588	157150.6132	12605.58684	0	22.05634038		
SACRAMEI	2024	T7 CAIRP construction	Aggregate	Aggregate	DSL	53.78117918	9828.227924	243.1426201	0	1.600844784		
SACRAMEI	2024	T7 NNOOS	Aggregate	Aggregate	DSL	988.6314135	191590.9645	14434.01864	0	25.39522394		
SACRAMEI	2024	T7 NOOS	Aggregate	Aggregate	DSL	343.1323426	61746.26076	5009.732202	0	8.888327976		
SACRAMEI	2024	T7 other port	Aggregate	Aggregate	DSL	10.8033276	1833.126924	82.10528976	0	0.292232953		
SACRAMEI	2024	T7 POAK	Aggregate	Aggregate	DSL	47.00370881	5841.356676	357.228187	0	0.970784911		
SACRAMEI	2024	T7 Public	Aggregate	Aggregate	DSL	4778.459512	96763.96923	14494.6605	0	17.5821313		
SACRAMEI	2024	T7 Single	Aggregate	Aggregate	DSL	1593.656194	118984.8548	18390.57153	0	16.93029809		
SACRAMEI	2024	T7 single construction	Aggregate	Aggregate	DSL	348.8214209	24382.02577	1577.008082	0	4.217422641		
SACRAMEI	2024	T7 SWCV	Aggregate	Aggregate	DSL	546.2342301	22279.51565	2130.313497	0	8.699180054		
SACRAMEI	2024	T7 SWCV	Aggregate	Aggregate	NG	309.0260029	12594.21775	1205.201411	5.186920782	0		
SACRAMEI	2024	T7 tractor	Aggregate	Aggregate	DSL	893.5748116	117962.8427	11348.40011	14.88039404	14.88039404		
SACRAMEI	2024	T7 tractor construction	Aggregate	Aggregate	DSL	295.3811602	20113.02465	1335.406741	3.503040016	3.503040016		
SACRAMEI	2024	T7 utility	Aggregate	Aggregate	DSL	24.9522763	506.0709972	286.9511774	0.084222357	0.084222357		
SACRAMEI	2024	T7IS	Aggregate	Aggregate	GAS	3.817736141	401.5883168	76.38526471	0.086850297	0		
SACRAMEI	2024	UBUS	Aggregate	Aggregate	GAS	212.9381293	16076.65729	851.7525173	3.729263937	0		
SACRAMEI	2024	UBUS	Aggregate	Aggregate	DSL	2.065794713	131.9980556	8.263178853	0	0.015090483		
SACRAMEI	2024	UBUS	Aggregate	Aggregate	ELEC	0.002191142	0.046907578	0.00876457	0	0		
SACRAMEI	2024	UBUS	Aggregate	Aggregate	NG	453.559249	43389.71084	1814.236996	11.24372105	0		
TOTAL							40,244,516		1366.87	254.14	24.8	0.04
Total (Gas)							36,768,587				26.9	0.04
Total (Diesel)							2,656,665				10.5	0.10
Annual VMT							260,611					
							Mix (%)	Miles	Gallons			
Gas							97.1%	253,180	9,412			
Diesel							2.9%	7,431	711			

**4.4 Fleet Mix**

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
Government Office Building	0.566033	0.037143	0.208217	0.113428	0.016713	0.004955	0.018463	0.024036	0.001978	0.001883	0.005758	0.000618	0.000776

Gas 97.1%  
Diesel 2.9%



EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: County

Region: SACRAMENTO

Calendar Year: 2020

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed miles/hr	Fuel	Population vehicles	VMT miles/day	Trips trips/day	Fuel gas 1,000 gallons/day	Diesel gas 1,000 gallons/day	Miles per gallon	Gasoline miles per gallon	Diesel miles per gallon
SACRAMEN	2020	LDA	Aggregated	Aggregated	GAS	562308.3977	20379237.88	2622438.143	684.8956964	0.00	29.76	27.07	5.20
SACRAMEN	2020	LDT1	Aggregated	Aggregated	GAS	62565.85469	2093109.763	283205.141	81.82020875	0.00	25.58		
SACRAMEN	2020	LDT2	Aggregated	Aggregated	GAS	200448.9527	7002680.301	925793.3827	301.8261924	0.00	23.20		
SACRAMEN	2020	T7 tractor construction	Aggregated	Aggregated	DSL	245.8322004	17275.95781	1111.39782	0.00	3.319186621	5.20		

Notes: Consistent with CalEEMod, worker vehicles assumed to be gasoline and 50% LDA, 25% LDT1, and 25% LDT2. Vendor and haul trips are assumed to be 100% diesel Heavy-Duty Trucks (T7).



EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: County

Region: SACRAMENTO

Calendar Year: 2021

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdYr	Speed miles/hr	Fuel	Population vehicles	VMT miles/day	Trips trips/day	Fuel gas 1,000 gallons/day	Diesel gas 1,000 gallons/day	Miles per gallon	Gasoline miles per gallon	Diesel miles per gallon
SACRAME	2021	LDA	Aggregated	Aggregated	GAS	576916.8631	20787699.97	2693628.523	680.3867171	0.00	30.55	27.82	5.28
SACRAME	2021	LDT1	Aggregated	Aggregated	GAS	63439.28027	2114017.763	287695.6243	80.67265944	0.00	26.20		
SACRAME	2021	LDT2	Aggregated	Aggregated	GAS	203602.0528	7045516.111	940182.7893	294.1321023	0.00	23.95		
SACRAME	2021	T7 tractor construction	Aggregated	Aggregated	DSL	258.7845228	17974.85613	1169.954766	0.00	3.407025315	5.28		

Notes: Consistent with CalEEMod, worker vehicles assumed to be gasoline and 50% LDA, 25% LDT1, and 25% LDT2. Vendor and haul trips are assumed to be 100% diesel Heavy-Duty Trucks (T7).

EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: County

Region: SACRAMENTO

Calendar Year: 2022

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CalYr	VehClass	MdlYr	Speed miles/hr	Fuel	Population vehicles	VMT miles/day	Trips trips/day	Fuel gas 1,000 gallons/day	Diesel gas 1,000 gallons/day	Miles per gallon	Gasoline miles per gallon	Diesel miles per gallon
SACRAMEI	2022	LDA	Aggregated	Aggregated	GAS	591545.2621	21127372.04	2764927.853	673.142382	0.00	31.39		
SACRAMEI	2022	LDT1	Aggregated	Aggregated	GAS	64366.14065	2129386.502	292380.935	79.27891431	0.00	26.86	28.59	5.40
SACRAMEI	2022	LDT2	Aggregated	Aggregated	GAS	206880.8861	7073751.275	955128.7989	285.8595601	0.00	24.75		
SACRAMEI	2022	T7 tractor construction	Aggregated	Aggregated	DSL	270.8028858	18680.66671	1224.289318	0.00	3.460572817	5.40		

Notes: Consistent with CalEEMod, worker vehicles assumed to be gasoline and 50% LDA, 25% LDT1, and 25% LDT2. Vendor and haul trips are assumed to be 100% diesel Heavy-Duty Trucks (T7).

EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: County

Region: SACRAMENTO

Calendar Year: 2023

Season: Annual

Vehicle Classification: EMFAC2011 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Region	CaYr	VehClass	MdYr	Speed miles/hr	Fuel	Population vehicles	VMT miles/day	Trips trips/day	Fuel gas 1,000 gallons/day	Diesel gas 1,000 gallons/day	Miles per gallon	Gasoline miles per gallon	Diesel miles per gallon
SACRAME	2023	LDA	Aggregated	Aggregated	GAS	606308.3182	21470907.57	2835871.384	665.4181032	0.00	32.27	29.42	5.68
SACRAME	2023	LDT1	Aggregated	Aggregated	GAS	65368.82489	2148247.633	297348.0731	77.95506082	0.00	27.56		
SACRAME	2023	LDT2	Aggregated	Aggregated	GAS	210187.0401	7110545.533	970164.8507	277.9033637	0.00	25.59		
SACRAME	2023	T7 tractor construction	Aggregated	Aggregated	DSL	284.6932222	19393.38955	1287.086989	0.00	3.416629408	5.68		

Notes: Consistent with CalEEMod, worker vehicles assumed to be gasoline and 50% LDA, 25% LDT1, and 25% LDT2. Vendor and haul trips are assumed to be 100% diesel Heavy-Duty Trucks (T7).