

Appendix E

Mobile Energy Calculations

Operational Fuel Use Summary

Fuel Type	Fleet Mix (%)	Gallons per Mile	Annual VMT	Gallons
Gasoline	97.25%	0.04	5,486,315	221,696
Diesel	2.75%	0.12		17,954

Notes:

1. Fleet mix calculated from CalEEMod default values for general office building land use type.
2. Gallons per mile calculated from EMFAC 2014.
3. Annual VMT obtained from CalEEMod output file.

Construction Fuel Usage Summary

	Diesel	Gasoline	Diesel
Construction Phase	Off-road Equipment (gallons)	On-road (gallons)	On-road (gallons)
TOTAL	150,525	65,619,698	2,359,716

Total Gasoline	65,619,698	gallons
Total Diesel	2,510,240	gallons

Construction Offroad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of days	Average Daily Factor	Diesel Fuel Usage
Demolition	Concrete/Industrial Saws	1	8	81	0.73	20	0.6	284
Demolition	Excavators	2	8	158	0.38	20	0.6	576
Demolition	Rubber Tired Dozers	1	8	247	0.4	20	0.6	474
Demolition	Tractors/Loaders/Backhoes	3	8	97	0.37	20	0.6	517
Demolition	Off-Highway Trucks	3	8	402	0.38	20	0.6	2,200
Site Preparation	Tractors/Loaders/Backhoes	1	8	97	0.37	10	0.6	86
Site Preparation	Graders	1	8	187	0.41	10	0.6	184
Architectural Coating	Air Compressors	3	6.00	78	0.48	20	0.6	404
Grading	Excavators	2	8.00	158	0.38	10	0.6	288
Grading	Scrapers	2	8.00	367	0.48	10	0.6	846
Building Construction	Off-Highway Trucks	3	8.00	402	0.38	756	0.6	83,150
Building Construction	Cranes	1	6.00	231	0.29	756	0.6	9,116
Building Construction	Forklifts	3	6.00	89	0.20	756	0.6	7,267
Building Construction	Generator Sets	2	8.00	84	0.74	756	0.6	22,557
Paving	Cement and Mortar Mixes	1	6.00	9	0.56	20	0.6	
Paving	Pavers	1	6.00	130	0.42	20	0.6	197
Paving	Rollers	1	7.00	80	0.38	20	0.6	128
Grading	Rubber Tired Dozers	1	6.00	247	0.40	10	0.6	178
Building Construction	Tractors/Loaders/Backhoes	3	6.00	97	0.37	756	0.6	14,652
Grading	Tractors/Loaders/Backhoes	1	7.00	97	0.37	10	0.6	75
Paving	Paving Equipment	1	8.00	132	0.36	20	0.6	228
Paving	Tractors/Loaders/Backhoes	1	8.00	97	0.37	20	0.6	172
Building Construction	Welders	3	8.00	46	0.45	756	0.6	11,267
TOTAL								150,525

Notes: Equipment assumptions are consistent with CalEEMod. Fuel usage average of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3E.

Trips and VMT

Phase Name	Daily Worker Trip	Daily Vendor Trip	Days per Year	Total Worker Trips	Total Vendor Trips	Worker Trip Length (miles)	Vendor Trip Length (miles)	Total Worker Trip Length (miles)	Total Vendor Trip Length (miles)	Average Daily Factor (worker and vendor)	Total gallons of gasoline	Total gallons of diesel
Demolition	50	0	20	1000	0	10.00	6.50	10000	0	0.6	146,296	0
Site Preparation	50	0	10	500	0	10.00	6.50	5000	0	0.6	73,148	0
Architectural Coating	50	0	20	1,000	0	10.00	6.50	10,000	0.00	0.6	146,296	0
Building Construction	590	137	756	446,040	103,572	10.00	6.50	4,460,400	673,218	0.6	65,253,958	2,359,716
Grading	50	0	10	500	0	10.00	6.50	5,000	0.00	0.6	73,148	0
Paving	50	0	20	1,000	0	10.00	6.50	10,000	0.00	0.6	146,296	0
TOTAL											65,619,698	2,359,716

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

EMFAC Fuel Consumption - Construction

For Passenger Vehicles: EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: County

Region: Sacramento

Calendar Year: 2018

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

For T7 Tractor Construction: EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: County

Region: Sacramento

Calendar Year: 2018

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
Sacramento	2018	LDA	Aggregated	Aggregated	GAS	534423.1	19389304	3354318	713.0656205	0.00	27.19	24.38	5.84
Sacramento	2018	LDT1	Aggregated	Aggregated	GAS	48969.183	1599958.9	294575.4	69.89017687	0.00	22.89		
Sacramento	2018	LDT2	Aggregated	Aggregated	GAS	192934.46	7333599.8	1209109	362.0567723	0.00	20.26		
Sacramento	2018	T7 tractor construction	Aggregated	Aggregated	DSL	123.79954	10856.92	0	0.00	1.858463161	5.84		

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

EMFAC Fuel Consumption - Operation

EMFAC2014 (v1.0.7) 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	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
Sacramento	2021	HHDT	Aggregate	Aggregate	GAS	83.00187179	9684.751936	1660.701451	2.113153106	0.00
Sacramento	2021	HHDT	Aggregate	Aggregate	DSL	9390.284545	849311.4627	0	0	151.0231535
Sacramento	2021	LDA	Aggregate	Aggregate	GAS	552222.0353	20117150.57	3476059.325	673.0793621	0.00
Sacramento	2021	LDA	Aggregate	Aggregate	DSL	5567.604704	214887.9298	34645.68727	0	5.406784354
Sacramento	2021	LDA	Aggregate	Aggregate	ELEC	14627.70494	731741.146	95205.68459	0	0.00
Sacramento	2021	LDT1	Aggregate	Aggregate	GAS	44772.69931	1501045.531	269507.1701	60.12007006	0.00
Sacramento	2021	LDT1	Aggregate	Aggregate	DSL	179.485534	3787.504144	926.3408646	0	0.139053008
Sacramento	2021	LDT1	Aggregate	Aggregate	ELEC	56.18539733	1558.053029	333.035947	0	0.00
Sacramento	2021	LDT2	Aggregate	Aggregate	GAS	203398.6278	7756096.267	1276635.151	348.5615001	2.56
Sacramento	2021	LDT2	Aggregate	Aggregate	DSL	317.4189552	13829.89842	2030.197847	0	0.452240996
Sacramento	2021	LHDT1	Aggregate	Aggregate	GAS	12919.38835	377689.8883	192479.6365	39.30637696	0.73
Sacramento	2021	LHDT1	Aggregate	Aggregate	DSL	12031.88076	393416.4613	151345.9239	0	22.59680063
Sacramento	2021	LHDT2	Aggregate	Aggregate	GAS	1825.604216	65347.5611	27198.78267	7.438542941	0.00
Sacramento	2021	LHDT2	Aggregate	Aggregate	DSL	3649.917373	139375.445	45911.36895	0	8.812057189
Sacramento	2021	MCY	Aggregate	Aggregate	GAS	32302.0757	225065.8675	64597.69099	6.049208154	0.00
Sacramento	2021	MDV	Aggregate	Aggregate	GAS	137560.3033	4495072.422	846179.2229	274.8835953	0.00
Sacramento	2021	MDV	Aggregate	Aggregate	DSL	1908.496359	80638.91244	12147.01947	0	3.422187571
Sacramento	2021	MH	Aggregate	Aggregate	GAS	3305.219725	27395.48255	330.6541813	4.162635401	0.00
Sacramento	2021	MH	Aggregate	Aggregate	DSL	831.7080382	7278.332275	83.17080382	0	0.762601798
Sacramento	2021	MHDT	Aggregate	Aggregate	GAS	1923.222645	89916.02242	38479.83868	14.29162119	0.00
Sacramento	2021	MHDT	Aggregate	Aggregate	DSL	14432.31416	611408.3488	0	0	74.13106176
Sacramento	2021	OBUS	Aggregate	Aggregate	GAS	718.1413418	37838.04173	14368.57197	5.814410187	0.00
Sacramento	2021	OBUS	Aggregate	Aggregate	DSL	524.0199242	39925.83079	0	0	5.917514935
Sacramento	2021	SBUS	Aggregate	Aggregate	GAS	141.9574421	7003.407906	567.8297685	0.597736164	0.00
Sacramento	2021	SBUS	Aggregate	Aggregate	DSL	432.3252424	16410.83429	0	0	2.269139705
Sacramento	2021	UBUS	Aggregate	Aggregate	GAS	245.9070095	36065.0352	983.6280378	7.299958647	0.00
Sacramento	2021	UBUS	Aggregate	Aggregate	DSL	312.1703556	45678.37583	1248.681423	0	9.333508097
TOTAL									1443.72	287.56
Total (Gas)									34,745,371	
Total (Diesel)									2,415,949	

Annual VMT

5,486,315

	Mix (%)	Miles	Gallons
Gas	97.3%	5,335,458	221,696
Diesel	2.7%	150,846	17,954

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Office Bui	0.555851	0.039752	0.20504	0.120748	0.020349	0.005402	0.018507	0.022668	0.002052	0.002157	0.005939	0.000618	0.000915

Gas	97.3%
Diesel	2.7%

21.9	0.05
24.1	0.04
8.4	0.12