

**Energy and Fuel Calculations
Sunset and Everett Project**

Summary Page

Summary of Energy Use during Construction	
Electricity	
Water Consumption	5,418 kWh
Temporary Power (lighting, tools)	70,560 kWh
Total	75,978 kWh
Gasoline	
On Road (Worker)	412,242 gallons
Off Road	0
Total	412,242 gallons
Diesel	
On Road (Vender)	71,742 gallons
On Road (Haul)	66,240 gallons
Off Road	106,193 gallons
Total	244,175 gallons
Total Transportation	656,417 gallons

Summary of Energy Use during Operation	
Building	1,771,660 kWh/year
Water Delivery	169,815 kWh/year
Electricity Total	1,941,475 kWh
Natural Gas	853,649 cf/year
Gasoline	166,997 gallons
Diesel	29,720 gallons
Total Transportation	196,717 gallons

Construction Page

Calculation of Gas Usage During Construction (On-road workers)						
Phase	Trips	Days	Length (miles)	Total (miles)	MPG	Gallons
Demolition	5	6				
Site Preparation	8	11				
Grading	20	75				
Construction	284	521				
Arch Coating	57	65				
Trenching	8	22				
Total	382	700	18.5	4,946,900	24	206,121
Total (round trips)						412,242
Fuel efficiency calculated using fuel consumption and VMT from ENFAC2021 v1.0.2. Total is doubled to account for round-trips. Trips and Days from CalEEMod 2022.1.1.17.						

Calculation of Diesel Usage During Construction (On-road vender)						
Phase	Trips	Days	Length (miles)	Total (miles)	MPG	Gallons
Construction	54	521	10.2	286,967	8	35,871
Total (round trips)						71,742
Fuel efficiency calculated using fuel consumption and VMT from ENFAC2021 v1.0.2. Total is doubled to account for round-trips. Trips and Days from CalEEMod 2022.1.1.17.						

Calculation of Diesel Usage During Construction (On-road haul)						
Phase	Trips	Days	Length (miles)	Total (mil)	MPG	Gallons
Demolition	9	6				
Site Preparation	68	11				
Grading	67	75				
Total	144	92	20	264,960	8	33,120
Total (round trips)						66,240
Fuel efficiency calculated using fuel consumption and VMT from ENFAC2021 v1.0.2. Total is doubled to account for round-trips. Trips and Days from CalEEMod 2022.1.1.17.						

Calculation of Diesel Usage During Construction (Off-road equipment)								
Phase	Equipment	Units	Hours	HP	Load Factor	Ave. Daily Factor	Days	HP-hours
Demolition	Dumpers/Tenders	1	8	16	0.38	0.6	6	175
	Excavators	1	8	36	0.38	0.6	6	394
Site Preparation	Graders	1	8	148	0.41	0.6	11	3,204
	Scrapers	1	8	423	0.48	0.6	11	10,721
	Tractors/Loaders/Backhoes	1	7	84	0.37	0.6	11	1,436
Grading	Graders	2	8	148	0.41	0.6	75	43,690
	Air Compressors	1	8	37	0.48	0.6	75	6,394
	Bore/Drill Rigs	1	8	83	0.5	0.6	75	14,940
	Cement and Mortar Mixers	1	8	10	0.56	0.6	75	2,016

	Concrete/Industrial Saws	1	8	33	0.73	0.6	75	8,672
	Excavators	1	8	36	0.38	0.6	75	4,925
	Other Construction Equipment	1	8	82	0.42	0.6	75	12,398
Construction	Cranes	1	8	367	0.29	0.6	521	266,160
	Forklifts	1	7	82	0.20	0.6	521	35,886
	Generator Sets	2	8	14	0.74	0.6	521	51,817
	Tractors/Loaders/Backhoes	1	6	84	0.37	0.6	521	58,294
	Welders	3	8	46	0.45	0.6	521	155,300
	Air Compressors	4	8	37	0.48	0.6	521	177,657
	Cement and Mortar Mixers	1	8	10	0.56	0.6	521	14,004
	Concrete/Industrial Saws	2	8	33	0.73	0.6	521	120,489
	Dumpers/Tenders	3	8	16	0.38	0.6	521	45,615
	Other Construction Equipment	5	8	82	0.42	0.6	521	430,638
	Other General Industrial Equipment	6	8	35	0.34	0.6	521	178,557
	Other Material Handling Equipment	3	8	93	0.40	0.6	521	279,089
	Pumps	1	8	11	0.74	0.6	521	20,357
	Skid Steer Loaders	1	8	71	0.37	0.6	521	65,697
	Arch Coatings	Air Compressors	1	6	37	0.48	0.6	65
Pressure Washers		1	8	14	0.30	0.6	65	1,310
Scrapers		1	8	423	0.48	0.6	65	63,348
Surfacing Equipment		1	8	399	0.30	0.6	65	37,346
Sweepers/Scrubbers		1	8	36	0.46	0.6	65	5,167
Trenching	Trenchers	1	8	40	0.50	0.6	22	2,112
	Dumpers/Tenders	1	8	14	0.30	0.6	22	444
	Excavators	1	8	36	0.38	0.6	22	1,445
							Total	2,123,850
							Total (diesel)	106,193

HP = horsepower

gallons of diesel fuel per HP-hour= 0.05

Equipment assumptions are provide in the CalEEMod output files and fuel usage estimate of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3E.

2,123,850 HP-hours = 106,193 gallons.

Equipment from CalEEMod 2022.1.1.17.

Water Usage for fugitive dust control during construction					
Phase	Days	Acres	Water Rate	Electrical Rate	Total
Grading	75	2.459	3,020 gallons / acre	0.009727 kWh / gallon	5,418 kWh
kWh – kilowatt hours Conservatively assumes the total amount of site that would be disturbed. Gallons per year of water usage for dust control is calculated based on a minimum control efficiency of 66% (three times daily) with an application rate of 3,020 gallons/acre/day (Air & Waste Management Association Air Pollution Engineering Manual (1992 Edition) and average of 26 construction days per month. CalEEMod Default: Each gallon of delivered potable water in Southern California is associated with 0.009727 kWh of electricity).					

Construction Electricity Usage

Equipment	Peak Power Rating	Typical Load	Average Output	Hours Per Day	Average Daily Output	Construction Days	Total
Caterpillar 40-C4.4 Generator	36 kWh	70%	25.2 kWh	4	100.8 kWh	700	70,560 kWh

Operation Page

Gasoline and Diesel Use – Operation				
Percent of Fleet			Fuel Consumption	
Fleet	94.4% Auto	4,007,922 miles	24 mpg gas	166,997
Mix	5.6% Other	237,758 miles	8 mpg diesel	29,720
Total				196,717
Daily VMT = 11,632 from Fehr & Peers, October 2023.				
Daily x 365 days = Annual VMT = 4,245,680				
Percent fleet based on VMT from ENFAC2021 v1.0.2				
Fuel efficiency calculated using fuel consumption and VMT from ENFAC2021 v1.0.2.				

Electricity by Land Use – Operation		
Use		Amount (kWh/year)
Proposed	Apartments	1,075,143
	Parking	388,339
	Restaurant	308,178
Total		1,771,660
CalEEMod 2022.1.1.17.		

Electricity by Water Use – Operation		
Use (gallons/day)	Use (gallons/year)	Amount (kWh/year)
41,914	15,298,610	169,815
Net increase.		
Indoor water results in 0.0111 kWh of electricity usage per gallon from delivery, treatment, and distribution of water within Southern California (CalEEMod).		

Natural Gas by Land Use – Operation			
Use		Amount (kBtu/year)	Amount (cf/year)
Proposed	Apartments	0	
	Parking	0	
	Restaurant	896,332	
Total		896,332	853,649
CalEEMod 2022.1.1.17.			
1 kBtu = 0.95238 cubic foot.			

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: County

Region: Los Angeles

Calendar Year: 2024 (Construction Start Year)

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: 1000 gallons/day for Fuel Consumption

Region	Calendar	Vehicle	Model Year	Speed	Fuel	Total VMT	Fuel Consum
Los Angeles	2024	LDA	Aggregate	Aggregate	Gasoline	134787726	4645.28045
Los Angeles	2024	LDT1	Aggregate	Aggregate	Gasoline	11637172.8	480.465489
Los Angeles	2024	LDT2	Aggregate	Aggregate	Gasoline	65943413.8	2777.31124
Los Angeles	2024	LHD1	Aggregate	Aggregate	Gasoline	5033814.91	372.611769
Los Angeles	2024	LHD2	Aggregate	Aggregate	Gasoline	723443.383	61.3167428
Los Angeles	2024	MCY	Aggregate	Aggregate	Gasoline	992731.969	24.0837309
Los Angeles	2024	MDV	Aggregate	Aggregate	Gasoline	36861226.6	1907.2112
Los Angeles	2024	MH	Aggregate	Aggregate	Gasoline	156937.988	32.3999133
Los Angeles	2024	OBUS	Aggregate	Aggregate	Gasoline	149449.666	29.6849597
Los Angeles	2024	SBUS	Aggregate	Aggregate	Gasoline	65854.3869	7.32704226
Los Angeles	2024	T6TS	Aggregate	Aggregate	Gasoline	815922.642	158.200512
Los Angeles	2024	T7IS	Aggregate	Aggregate	Gasoline	2968.25851	0.73212166
Los Angeles	2024	UBUS	Aggregate	Aggregate	Gasoline	30984.4351	6.75355384
					Total	257201647	10503.3787

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: County

Region: Los Angeles

Calendar Year: 2024 (Construction Start Year)

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: 1000 gallons/day for Fuel Consumption

Region	Calendar	Vehicle Category	Model Year	Speed	Fuel	Total VMT	Fuel Consum
Los Angeles	2024	All Other Buses	Aggregate	Aggregate	Diesel	84320.7864	9.13342383
Los Angeles	2024	LDA	Aggregate	Aggregate	Diesel	270276.227	6.70781088
Los Angeles	2024	LDT1	Aggregate	Aggregate	Diesel	2452.06113	0.1062145
Los Angeles	2024	LDT2	Aggregate	Aggregate	Diesel	218613.196	6.93948117
Los Angeles	2024	LHD1	Aggregate	Aggregate	Diesel	2559140.62	125.037303
Los Angeles	2024	LHD2	Aggregate	Aggregate	Diesel	1133991.92	65.752053
Los Angeles	2024	MDV	Aggregate	Aggregate	Diesel	440034.429	18.6649573
Los Angeles	2024	MH	Aggregate	Aggregate	Diesel	59113.8029	5.92387259
Los Angeles	2024	Motor Coach	Aggregate	Aggregate	Diesel	85962.3931	15.5548598
Los Angeles	2024	PTO	Aggregate	Aggregate	Diesel	110814.403	22.3780479
Los Angeles	2024	SBUS	Aggregate	Aggregate	Diesel	40241.0028	5.46099729
Los Angeles	2024	T6 CAIRP Class	Aggregate	Aggregate	Diesel	2254.98449	0.24411331
Los Angeles	2024	T6 CAIRP Class	Aggregate	Aggregate	Diesel	3095.74317	0.33508252
Los Angeles	2024	T6 CAIRP Class	Aggregate	Aggregate	Diesel	8063.59556	0.85916901
Los Angeles	2024	T6 CAIRP Class	Aggregate	Aggregate	Diesel	50774.9415	5.06908295
Los Angeles	2024	T6 Instate Deliv	Aggregate	Aggregate	Diesel	131366.603	14.8113173
Los Angeles	2024	T6 Instate Deliv	Aggregate	Aggregate	Diesel	135604.665	15.3897105
Los Angeles	2024	T6 Instate Deliv	Aggregate	Aggregate	Diesel	414343.881	46.8256252
Los Angeles	2024	T6 Instate Deliv	Aggregate	Aggregate	Diesel	166436.016	18.3517575
Los Angeles	2024	T6 Instate Othe	Aggregate	Aggregate	Diesel	205340.707	23.2030883
Los Angeles	2024	T6 Instate Othe	Aggregate	Aggregate	Diesel	473402.707	53.681894
Los Angeles	2024	T6 Instate Othe	Aggregate	Aggregate	Diesel	421292.868	47.6422673
Los Angeles	2024	T6 Instate Othe	Aggregate	Aggregate	Diesel	211862.925	23.5575335
Los Angeles	2024	T6 Instate Trac	Aggregate	Aggregate	Diesel	6925.59801	0.77440705
Los Angeles	2024	T6 Instate Trac	Aggregate	Aggregate	Diesel	102948.543	10.8442809
Los Angeles	2024	T6 OOS Class 4	Aggregate	Aggregate	Diesel	1294.92126	0.13953167
Los Angeles	2024	T6 OOS Class 5	Aggregate	Aggregate	Diesel	1776.39911	0.1914825
Los Angeles	2024	T6 OOS Class 6	Aggregate	Aggregate	Diesel	4641.78169	0.4913569
Los Angeles	2024	T6 OOS Class 7	Aggregate	Aggregate	Diesel	33751.5249	3.34470857
Los Angeles	2024	T6 Public Class	Aggregate	Aggregate	Diesel	25101.672	2.94080898
Los Angeles	2024	T6 Public Class	Aggregate	Aggregate	Diesel	17374.7237	2.06368586
Los Angeles	2024	T6 Public Class	Aggregate	Aggregate	Diesel	21065.0065	2.51203406
Los Angeles	2024	T6 Public Class	Aggregate	Aggregate	Diesel	115935.316	13.5077147
Los Angeles	2024	T6 Utility Class	Aggregate	Aggregate	Diesel	25977.1553	2.79970815

Los Angeles	2024 T6 Utility Class	Aggregate	Aggregate	Diesel	4885.08143	0.52429146
Los Angeles	2024 T6 Utility Class	Aggregate	Aggregate	Diesel	6782.24948	0.72462216
Los Angeles	2024 T7 CAIRP Class	Aggregate	Aggregate	Diesel	1420991.89	228.884963
Los Angeles	2024 T7 NNOOS Clas	Aggregate	Aggregate	Diesel	1695427.87	268.029645
Los Angeles	2024 T7 NOOS Class	Aggregate	Aggregate	Diesel	615627.99	99.0204109
Los Angeles	2024 T7 POAK Class	Aggregate	Aggregate	Diesel	111.339704	0.01996242
Los Angeles	2024 T7 POLA Class	Aggregate	Aggregate	Diesel	1135455.05	190.064156
Los Angeles	2024 T7 Public Class	Aggregate	Aggregate	Diesel	147036.517	25.6840206
Los Angeles	2024 T7 Single Concr	Aggregate	Aggregate	Diesel	50746.3516	8.35605584
Los Angeles	2024 T7 Single Dump	Aggregate	Aggregate	Diesel	122729.5	20.4552565
Los Angeles	2024 T7 Single Other	Aggregate	Aggregate	Diesel	345935.61	57.2479417
Los Angeles	2024 T7 SWCV Class	Aggregate	Aggregate	Diesel	75582.0906	28.919627
Los Angeles	2024 T7 Tractor Clas	Aggregate	Aggregate	Diesel	1112064.64	180.732169
Los Angeles	2024 T7 Utility Class	Aggregate	Aggregate	Diesel	20739.3728	3.35748029
Los Angeles	2024 UBUS	Aggregate	Aggregate	Diesel	6248.8188	0.97813061
				Total	14345957.5	1684.23812

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: County

Region: Los Angeles

Calendar Year: 2027 (Operation Year)

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: 1000 gallons/day for Fuel Consumption

Region	Calend	Vehicle	Model	Year	Speed	Fuel	Total VMT	Fuel Consum
Los Angeles	2027	LDA	Aggregate	Aggregate	Aggregate	Gasoline	127411269	4134.43086
Los Angeles	2027	LDT1	Aggregate	Aggregate	Aggregate	Gasoline	11091280.1	432.899059
Los Angeles	2027	LDT2	Aggregate	Aggregate	Aggregate	Gasoline	69171014.5	2709.65533
Los Angeles	2027	LHD1	Aggregate	Aggregate	Aggregate	Gasoline	5037761.84	349.870245
Los Angeles	2027	LHD2	Aggregate	Aggregate	Aggregate	Gasoline	708229.223	56.5744315
Los Angeles	2027	MCY	Aggregate	Aggregate	Aggregate	Gasoline	1042272.87	25.0570567
Los Angeles	2027	MDV	Aggregate	Aggregate	Aggregate	Gasoline	37949923.6	1826.10978
Los Angeles	2027	MH	Aggregate	Aggregate	Aggregate	Gasoline	151088.154	31.2027473
Los Angeles	2027	OBUS	Aggregate	Aggregate	Aggregate	Gasoline	127437.703	24.5731296
Los Angeles	2027	SBUS	Aggregate	Aggregate	Aggregate	Gasoline	69457.4503	7.62436157
Los Angeles	2027	T6TS	Aggregate	Aggregate	Aggregate	Gasoline	755094.268	141.804025
Los Angeles	2027	T7IS	Aggregate	Aggregate	Aggregate	Gasoline	2421.96548	0.55632226
Los Angeles	2027	UBUS	Aggregate	Aggregate	Aggregate	Gasoline	30482.5139	6.572381
						Total	253547733	9746.92973

Source: EMFAC2021 (v1.0.2) Emissions Inventory

Region Type: County

Region: Los Angeles

Calendar Year: 2027 (Operation Year)

Season: Annual

Vehicle Classification: EMFAC202x Categories

Units: 1000 gallons/day for Fuel Consumption

Region	Calend	Vehicle Ca	Model Year	Speed	Fuel	Total VMT	Fuel Consum
Los Angeles	2027	All Other E	Aggregate	Aggregate	Diesel	83424.0023	8.76495021
Los Angeles	2027	LDA	Aggregate	Aggregate	Diesel	201833.555	4.79953465
Los Angeles	2027	LDT1	Aggregate	Aggregate	Diesel	915.844089	0.03801334
Los Angeles	2027	LDT2	Aggregate	Aggregate	Diesel	241831.323	7.21891164
Los Angeles	2027	LHD1	Aggregate	Aggregate	Diesel	2872082.69	138.132154
Los Angeles	2027	LHD2	Aggregate	Aggregate	Diesel	1291571.38	73.2478107
Los Angeles	2027	MDV	Aggregate	Aggregate	Diesel	445305.215	17.8304804
Los Angeles	2027	MH	Aggregate	Aggregate	Diesel	64332.9012	6.45264657
Los Angeles	2027	Motor Coa	Aggregate	Aggregate	Diesel	87406.9534	15.2977372
Los Angeles	2027	PTO	Aggregate	Aggregate	Diesel	112257.549	21.8148666
Los Angeles	2027	SBUS	Aggregate	Aggregate	Diesel	36021.2395	4.83470287
Los Angeles	2027	T6 CAIRP C	Aggregate	Aggregate	Diesel	2268.1982	0.23990863
Los Angeles	2027	T6 CAIRP C	Aggregate	Aggregate	Diesel	3122.41685	0.33095857
Los Angeles	2027	T6 CAIRP C	Aggregate	Aggregate	Diesel	8052.42732	0.83994292
Los Angeles	2027	T6 CAIRP C	Aggregate	Aggregate	Diesel	51646.8736	4.95383819
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	133383.852	14.8465754
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	137978.739	15.4836341
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	421463.659	47.1206759
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	172252.977	18.9499509
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	207967.509	23.192584
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	480858.834	53.8843158
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	427663.912	47.7938442
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	216408.428	23.831845
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	7032.87606	0.77955262
Los Angeles	2027	T6 Instate	Aggregate	Aggregate	Diesel	106054.606	10.9899353
Los Angeles	2027	T6 OOS Cl	Aggregate	Aggregate	Diesel	1350.78371	0.13913331
Los Angeles	2027	T6 OOS Cl	Aggregate	Aggregate	Diesel	1853.03234	0.19160302
Los Angeles	2027	T6 OOS Cl	Aggregate	Aggregate	Diesel	4842.02652	0.48899667
Los Angeles	2027	T6 OOS Cl	Aggregate	Aggregate	Diesel	35207.5538	3.32810136
Los Angeles	2027	T6 Public C	Aggregate	Aggregate	Diesel	24252.7922	2.80232293
Los Angeles	2027	T6 Public C	Aggregate	Aggregate	Diesel	16866.17	1.97077333
Los Angeles	2027	T6 Public C	Aggregate	Aggregate	Diesel	20244.3948	2.3496698
Los Angeles	2027	T6 Public C	Aggregate	Aggregate	Diesel	111487.68	12.680367
Los Angeles	2027	T6 Utility C	Aggregate	Aggregate	Diesel	25099.7556	2.67827815

Los Angeles	2027	T6 Utility (Aggregate	Aggregate	Diesel	4726.79724	0.50256885
Los Angeles	2027	T6 Utility (Aggregate	Aggregate	Diesel	6532.22205	0.68911917
Los Angeles	2027	T7 CAIRP (Aggregate	Aggregate	Diesel	1461343.13	224.917371
Los Angeles	2027	T7 NNOOS Aggregate	Aggregate	Diesel	1791228.38	263.197057
Los Angeles	2027	T7 NOOS (Aggregate	Aggregate	Diesel	650414.182	98.7386578
Los Angeles	2027	T7 POAK C Aggregate	Aggregate	Diesel	116.588575	0.02089984
Los Angeles	2027	T7 POLA C Aggregate	Aggregate	Diesel	1267216.64	211.343815
Los Angeles	2027	T7 Public (Aggregate	Aggregate	Diesel	134380.047	23.0970075
Los Angeles	2027	T7 Single (Aggregate	Aggregate	Diesel	49502.867	7.90743559
Los Angeles	2027	T7 Single [Aggregate	Aggregate	Diesel	120679.566	19.8753802
Los Angeles	2027	T7 Single (Aggregate	Aggregate	Diesel	355342.974	58.021041
Los Angeles	2027	T7 SWCV (Aggregate	Aggregate	Diesel	54850.0347	20.8348861
Los Angeles	2027	T7 Tractor Aggregate	Aggregate	Diesel	1158955.78	184.088863
Los Angeles	2027	T7 Utility (Aggregate	Aggregate	Diesel	20432.2289	3.27444108
Los Angeles	2027	UBUS Aggregate	Aggregate	Diesel	2363.51075	0.41301156
				Total	15132427.1	1705.22017