

Construction Off-Road Equipment										
Phase	Off-Road Equipment Type	Amount	Usage Hour/Day	Total Usage Days	Total Usage Hours/Equipment	Horsepower	Load Factor	Total Usage Hours/ Equipment	Horsepower-Hour	Fuel Usage (gallons)
Demolition and Site Preparation	Concrete/Industrial Saws	1	8	22	176	81	0.73	176	10406.88	532.832256
	Excavators	1	8	22	176	271	0.38	176	18124.48	927.973376
	Rubber Tired Dozers	1	8	22	176	247	0.4	176	17388.8	890.30656
	Tractors/Loaders/Backhoes	1	8	22	176	97	0.37	176	6316.64	323.411968
Rough Grading	Excavators	2	8	22	352	271	0.38	352	36248.96	1855.946752
	Graders	2	8	22	352	187	0.41	352	26987.84	1381.777408
	Rubber Tired Dozers	1	8	22	176	247	0.4	176	17388.8	890.30656
	Tractors/Loaders/Backhoes	2	8	22	352	97	0.37	352	12633.28	646.823936
Paving	Pavers	1	8	22	176	125	0.442	176	9724	497.8688
	Paving Equipment	1	8	22	176	130	0.36	176	8236.8	421.72416
	Rollers	1	8	22	176	80	0.38	176	5350.4	273.94048
Utility Trenching	Excavators	2	8	22	352	271	0.38	352	36248.96	1855.946752
	Tractors/Loaders/Backhoes	2	8	22	352	97	0.37	352	12633.28	646.823936
Fine Grading	Rollers	1	8	24	192	101	0.38	192	7368.96	377.290752
	Crawler Tractors	1	8	24	192	110	0.43	192	9081.6	464.97792
	Other Construction Equipment	1	8	24	192	250	0.42	192	20160	1032.192
Building Construction	Cranes	1	8	391	3128	226	0.29	3128	205009.12	10496.46694
	Forklifts	3	8	391	9384	89	0.2	9384	167035.2	8552.20224
	Generator Sets	1	8	391	3128	84	0.74	3128	194436.48	9955.147776
	Welders	1	8	391	3128	46	0.45	3128	64749.6	3315.17952
Architectural Coating	Air Compressors	1	8	115	920	78	0.48	920	34444.8	1763.57376
Finishing/Landscaping	Tractors/Loaders/Backhoes	3	8	86	2064	97	0.37	2064	74076.96	3792.740352
									Total	50895.45421

Diesel

Construction Truck and Construction Worker Vehicle Fuel Efficiency				
Vehicle Type	Vehicle Class	EMFAC 2021 Outputs		Fuel Efficiency (miles/gallon)
		Fuel Consumption (1,000 gallons/day)	VMT (miles/day)	
Construction Truck	MHDT	14.3	112775.5	7.9
	HHDT/MHDT	113.4	676928.2	6.0
	HHDT/MHDT	-	-	6.9
Construction Worker Vehicle	LDA	228.1	6591971.3	28.9
	LDT1	21.6	523919.3	24.3
	LDT2	110.3	2555280.3	23.2
	Worker Mix	-	-	26.3

Notes:

¹ For construction trucks assumes 50 percent HHDT and 50 percent MHDT vehicles, consistent with assumptions in CalEEMod for hauling trucks. For construction worker vehicles assumes 50 percent LDA, 25 percent LDT1, and 25 percent LDT2 vehicles, consistent with assumptions in CalEEMod for worker vehicles.

² EMFAC2021 was run for Solano County for the construction year 2023. Data was aggregated over all vehicle model years and speed bins.

³ The fuel efficiency was calculated by dividing the VMT (miles/day) by the fuel consumption (gallons/day).

Construction Vehicle Fuel Use - Diesel Vehicles						
Phase	Trip Type	Total Trips	Trip Length (miles)	Total VMT	Diesel Fuel Efficiency (miles/gallon)	Fuel Usage (gallons/year)
Demolition and Site Preparation	Hauling	76	21	1596	6.0	266.0
Rough Grading	Hauling	1288	20	25760	6.0	4293.3
Building Construction	Vendor	46920	7.3	342516	6.9	49640.0
					Total	54199.3

Diesel

¹ Assumes 100 percent HHDT vehicles for haul trucks and 50 percent HHDT/50 percent MHDT vehicles for MHDT, consistent with assumptions in CalEEMod.

² EMFAC2021 was run for Solano County for the construction year 2023. Data was aggregated over all vehicle model years and speed bins.

³ The fuel efficiency was calculated by dividing the VMT (miles/day) by the fuel consumption (gallons/day).

Construction Worker Vehicle Fuel Use - Gasoline Vehicles							
Phase	Total One-Way Trips/Day	Total Days	Total Trips	Trip Length (miles)	Total VMT	Gasoline Fuel Efficiency (miles/gallon)	Fuel Usage (gallons/year)
Demolition and Site Preparation	50	22	2200	10.8	23760	26.3	903.4
Rough Grading	50	22	2200	10.8	23760	26.3	903.4
Paving	75	22	3300	10.8	35640	26.3	1355.1
Utility Trenching	75	22	3300	10.8	35640	26.3	1355.1
Fine Grading	50	24	2400	10.8	25920	26.3	985.6
Building Construction	100	391	78200	10.8	844560	26.3	32112.5
Architectural Coating	50	115	11500	10.8	124200	26.3	4722.4
Finishing/Landscaping	50	89	8900	10.8	96120	26.3	3654.8
						Total	45992.4

Gas

Total Construction Gasoline Usage	45992.4
Total Construction Diesel Usage	105094.8

Proposed Project Operational Trips													
Vehicle Class	CalEEMod	Total Project Trips	Total Trips per Vehicle Class	Gasoline		Diesel		Electric		Natural Gas		Plug-in Hybrid	
				EMFAC %	Number of Trips	EMFAC %	Number of Trips	EMFAC %	Number of Trips	EMFAC %	Number of Trips	EMFAC %	Number of Trips
LDA	0.553839	840	465.2	93%	430.8	0%	1.4	5%	21.4	0%	0.0	3%	11.20
LDT1	0.0587	840	49.3	100%	49.1	0%	0.0	0%	0.1	0%	0.0	0%	0.0
LDT2	0.188468	840	158.3	98%	155.5	0%	0.5	1%	1.1	0%	0.0	1%	1.2
MDV	0.120786	840	101.5	97%	98.2	2%	1.5	1%	1.0	0%	0.0	1%	0.7
LHD1	0.022796	840	19.1	54%	10.3	46%	8.8	0%	0.1	0%	0.0	0%	0.0
LHD2	0.005663	840	4.8	27%	1.3	73%	3.5	0%	0.0	0%	0.0	0%	0.0
MHD	0.010629	840	8.9	12%	1.0	73%	6.5	0%	0.0	0%	0.0	0%	0.0
HHH	0.007566	840	6.4	0%	0.0	95%	6.1	1%	0.0	4%	0.3	8%	0.0
OBUS	0.000983	840	0.8	65%	0.5	34%	0.3	0%	0.0	1%	0.0	0%	0.0
UBUS	0.000556	840	0.5	25%	0.1	45%	0.2	1%	0.0	28%	0.1	0%	0.0
MCY	0.026354	840	22.1	100%	22.1	0%	0.0	0%	0.0	0%	0.0	0%	0.0
SBUS	0.000841	840	0.7	9%	0.1	88%	0.6	1%	0.0	2%	0.0	0%	0.0
MH	0.00282	840	2.4	71%	1.7	29%	0.7	0%	0.0	0%	0.0	0%	0.0
				Total	770.7	Total	30.0	Total	23.8	Total	0.4	Total	13.2
				Percentage	91.8%	Percentage	3.6%	Percentage	2.8%	Percentage	0.1%	Percentage	1.6%

Proposed Project Operational Trips – Fuel Efficiency						
Fuel	Vehicle Class	EMFAC2021 Outputs ¹				Fuel Efficiency ³ (miles/gallon)
		Fleet Mix (%) ²	Fuel Consumption (1,000 gallons/day)	VMT (miles/day)	Fuel Efficiency ³ (miles/gallon)	
Gas	LDA	52%	220.6	6,585,579.5	29.9	15.5
	LDT1	5%	19.9	495,747.6	25.0	1.2
	LDT2	22%	110.3	2,660,496.7	24.1	5.2
	MDV	2%	23.9	230,912.0	9.6	0.2
	LHD1	0%	3.3	28,253.1	8.7	0.0
	LHD2	3%	1.3	53,171.4	40.7	1.3
	MHDT	16%	90.2	1,773,609.7	19.7	3.1
	HHDT	0%	2.4	10,688.0	4.4	0.0
	OBUS	0%	2.1	10,217.2	4.8	0.0
	UBUS	0%	0.2	1,972.5	10.0	0.0
	MCY	0%	4.9	23,497.0	4.8	0.0
	SBUS	0%	0.0	46.5	3.7	0.0
	MH	0%	0.3	1,865.9	7.0	0.0
	Fleet Mix	–	–	–	26.5	26.5
Diesel	LDA	3%	0.4	15,772.0	42.4	1.2
	LDT1	0%	0.0	44.0	24.4	0.0
	LDT2	1%	0.3	9,538.0	32.2	0.4
	MDV	4%	1.2	28,708.1	24.1	1.0
	LHD1	30%	12.1	191,839.4	15.9	4.8
	LHD2	12%	6.0	78,286.2	13.1	1.5
	MHDT	16%	44.6	32.4	0.0	0.0
	HHDT	28%	112.4	690,917.5	6.1	1.7
	OBUS	1%	0.5	4,500.5	0.0	0.0
	UBUS	0%	0.8	7,307.5	0.0	0.0
	MCY	0%	0.0	0.0	0.0	0.0
	SBUS	2%	0.9	6,980.0	8.1	0.2
	MH	3%	0.5	4,477.6	9.4	0.3
	Fleet Mix	–	–	–	11.1	11.1
Electric	LDA	88%	0.0	396,521.6	0	0.0
	LDT1	0%	0.0	1,394.3	0	0.0
	LDT2	5%	0.0	16,743.3	0	0.0
	MDV	5%	0.0	17,945.4	0	0.0
	LHD1	0%	0.0	3,016.3	0	0.0
	LHD2	0%	0.0	736.4	0	0.0
	MHDT	0%	0.0	1,251.4	0	0.0
	HHDT	0%	0.0	3,505.6	0	0.0
	OBUS	0%	0.0	63.8	0	0.0
	SBUS	0%	0.0	57.9	0	0.0
	UBUS	0%	0.0	52.1	0	0.0
	Fleet Mix	–	–	–	0.0	0.0
Natural Gas	MHDT	7%	0.1	998.9	7.3	0.5
	HHDT	74%	2.7	14,518.9	5.3	3.9
	OBUS	1%	0.0	166.9	7.5	0.1
	SBUS	3%	0.0	186.5	5.7	0.1
	UBUS	15%	186.5	5,116.6	0.0	0.0
	Fleet Mix	–	–	–	4.7	4.7
Plug-in Hybrid	LDA	83%	3.3	218,267.0	66.0	54.6
	LDT1	0%	0.0	1,073.2	73.4	0.3
	LDT2	10%	0.4	26,548.0	69.6	7.0
	MDV	7%	0.3	18,092.2	67.2	4.6
	Fleet Mix	–	–	–	66.4	66.4

Notes:
¹ EMFAC2021 was run for Solano County for the operational year 2025. Data was aggregated over all vehicle model years and speed bins.
² Fleet mix is based on assumptions made in CalEEMod for the proposed project.
³ The fuel efficiency was calculated by dividing the VMT (miles/day) by the fuel consumption (gallons/day).

Proposed Project Operational Trips – Fuel Usage							
Land Use	Total Annual VMT ² (miles/year)	Fuel Type	Portion of Fleet ³ (%)	VMT by Fuel Type (miles/year)	Fleet Mix Efficiency ⁴ (miles/gallon)	Fuel Usage (gallons/year)	
Apartments Mid Rise	1,473,808.00	Gas	92%	1352220	26.5	51006.2	
		Diesel	4%	52712	11.1	4741.9	
		Electric	3%	41762	0.0	0.0	
		Natural Gas	0%	744	4.7	159.5	
		Plug-in Hybrid	2%	23127	66.4	348.1	
						Total Gasoline/year	51354.3
						Total Diesel/year	4741.9

Notes:
¹ Calculated for operational year 2025 only. Future years will likely use less fuel due to more efficient cars.
² Total VMT is based on project's trip generation and trip lengths.
³ Fleet distribution is based on EMFAC2021 output and CalEEMod assumptions.
⁴ Fuel efficiency is based on fuel consumption and VMT data from EMFAC2021 for Solano County and total VMT.

Electricity Usage	
Electricity by Land Use	kWh/year
Apartments Mid Rise	681932
City Park	-2
Enclosed Parking with Elevator	288757
Health Club	153609
Other Asphalt Surfaces	(2)
Total	1,124,294