

Appendix B

Energy Calculations

Operational Energy Summary

Land Use	Electricity kWh/year	Electricity MWh/year	Diesel gallons/year	Gasoline gallons/year	therm/kbtu	100.000000
Other Non- Asphalt Surfaces	0	0			kBTU/MMBT	1000
Research & Development	570,693	571	12,218	260.00		
Total	570,693	571	12,218	260		

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Average Daily Factor	Diesel Fuel Usage	Fuel Type
Forklifts	22	4	260	89	0.2	0.6	12,218	Diesel

Energy Calculations Summary

Operational Fuel Use Summary

Fuel Type	Fleet Mix (%)	Gallons per Mile	Annual VMT	Gallons
Gasoline	95.40%	0.03	445,794	14,688
Diesel	4.60%	0.10		1,990

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.

EMFAC2017 (v1.0.2) Emissions Inventory

Region Type: County

Region: YOLO

Calendar Year: 2025

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. Note 'day' in the unit is operation day.

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		
YOLO	2025	All Other Buses	Aggregate	Aggregate	DSL	44.38394023	2159.891769	372.825098	0	0.23079384		
YOLO	2025	LDA	Aggregate	Aggregate	GAS	94150.78873	3947087.534	443669.6131	113.2899809	0		
YOLO	2025	LDA	Aggregate	Aggregate	DSL	1161.471005	48598.50045	5445.612897	0	0.903901639		
YOLO	2025	LDA	Aggregate	Aggregate	ELEC	2799.48716	119708.3115	13870.92523	0	0		
YOLO	2025	LDT1	Aggregate	Aggregate	GAS	11424.84689	382901.0307	52075.61908	13.12450374	0.00		
YOLO	2025	LDT1	Aggregate	Aggregate	DSL	10.41983794	174.8877086	36.73121761	0	0.007612279		
YOLO	2025	LDT1	Aggregate	Aggregate	ELEC	137.611213	6019.122665	685.8095466	0	0		
YOLO	2025	LDT2	Aggregate	Aggregate	GAS	35908.80239	1244391.169	166404.351	44.87109141	0.00		
YOLO	2025	LDT2	Aggregate	Aggregate	DSL	267.0348147	10509.07641	1292.333004	0	0.262992984		
YOLO	2025	LDT2	Aggregate	Aggregate	ELEC	543.9073616	16589.52389	2722.431403	0	0		
YOLO	2025	LHD1	Aggregate	Aggregate	GAS	2927.79495	93282.15798	43619.78234	10.87348745	0.00		
YOLO	2025	LHD1	Aggregate	Aggregate	DSL	3466.927129	107330.2258	43609.58188	0	5.881307909		
YOLO	2025	LHD2	Aggregate	Aggregate	GAS	387.9067016	12661.47831	5779.231873	1.678761537	0.00		
YOLO	2025	LHD2	Aggregate	Aggregate	DSL	988.4732023	32746.41126	12433.74939	0	1.981174568		
YOLO	2025	MCY	Aggregate	Aggregate	GAS	5867.721865	38196.82098	11735.44373	1.03041562	0.00		
YOLO	2025	MDV	Aggregate	Aggregate	GAS	27490.25182	908017.6624	125003.606	40.65444844	0.00		
YOLO	2025	MDV	Aggregate	Aggregate	DSL	762.1728147	28532.40736	3597.798295	0	0.970089377		
YOLO	2025	MDV	Aggregate	Aggregate	ELEC	336.1701987	10509.49405	1696.203251	0	0.00		
YOLO	2025	MH	Aggregate	Aggregate	GAS	419.4763513	3753.919636	41.96441419	0.747402799	0.00		
YOLO	2025	MH	Aggregate	Aggregate	DSL	175.8383491	1529.527118	17.58383491	0	0.150759057		
YOLO	2025	Motor Coach	Aggregate	Aggregate	DSL	4.209740487	559.2718038	61.46221111	0	0.083132244		
YOLO	2025	OBUS	Aggregate	Aggregate	GAS	68.13239073	3256.817002	1363.192874	0.655395241	0.00		
YOLO	2025	PTO	Aggregate	Aggregate	DSL	0	9055.362988	0	0	1.636467895		
YOLO	2025	SBUS	Aggregate	Aggregate	GAS	17.75559866	859.522388	71.02239464	0.085180954	0.00		
YOLO	2025	SBUS	Aggregate	Aggregate	DSL	118.3536054	3725.253003	1365.784197	0	0.44833672		
YOLO	2025	T6 Ag	Aggregate	Aggregate	DSL	24.41397227	201.1110588	107.421478	0	0.022545204		
YOLO	2025	T6 CAIRP heavy	Aggregate	Aggregate	DSL	37.06295424	6916.253254	541.1191319	0	0.56292452		
YOLO	2025	T6 CAIRP small	Aggregate	Aggregate	DSL	20.61849303	1024.310007	301.0299982	0	0.090299499		
YOLO	2025	T6 instate construction he	Aggregate	Aggregate	DSL	78.8948894	5015.729696	356.6807276	0	0.574714315		
YOLO	2025	T6 instate construction sm	Aggregate	Aggregate	DSL	595.3561962	31892.30033	2691.582216	0	3.61113681		
YOLO	2025	T6 instate heavy	Aggregate	Aggregate	DSL	1326.513977	182423.1277	15307.78738	0	16.23908253		
YOLO	2025	T6 instate small	Aggregate	Aggregate	DSL	3511.829376	201119.3642	40526.02411	0	18.69129241		
YOLO	2025	T6 OOS heavy	Aggregate	Aggregate	DSL	21.52936232	4024.494042	314.3286899	0	0.327404993		
YOLO	2025	T6 OOS small	Aggregate	Aggregate	DSL	11.16156032	547.9367403	162.9587807	0	0.048457171		
YOLO	2025	T6 Public	Aggregate	Aggregate	DSL	152.115619	2251.613272	461.4173771	0	0.314950546		
YOLO	2025	T6 utility	Aggregate	Aggregate	DSL	55.83910299	929.4465246	642.1496844	0	0.095564586		
YOLO	2025	T6T5	Aggregate	Aggregate	GAS	228.0180898	11892.24419	4562.185942	2.341531364	0		
YOLO	2025	T7 Ag	Aggregate	Aggregate	DSL	14.65354342	88.77278804	64.47559104	0	0.017158213		
YOLO	2025	T7 CAIRP	Aggregate	Aggregate	DSL	313.1227822	57493.73433	4571.59262	0	7.877284558		
YOLO	2025	T7 CAIRP construction	Aggregate	Aggregate	DSL	19.72155682	3602.842211	89.1603916	0	0.573810583		
YOLO	2025	T7 NNOOS	Aggregate	Aggregate	DSL	368.283706	70111.23155	5376.942107	0	9.032860828		
YOLO	2025	T7 NOOS	Aggregate	Aggregate	DSL	124.6906984	22581.61937	1820.484196	0	3.175854235		
YOLO	2025	T7 other port	Aggregate	Aggregate	DSL	3.701564436	608.2930209	28.13188972	0	0.095724035		
YOLO	2025	T7 POAK	Aggregate	Aggregate	DSL	16.07260879	2091.762759	122.1518268	0	0.342941069		
YOLO	2025	T7 Public	Aggregate	Aggregate	DSL	400.792256	8127.993078	1215.736509	0	1.507450108		
YOLO	2025	T7 Single	Aggregate	Aggregate	DSL	596.9840496	45604.61802	6889.113164	0	6.421352383		
YOLO	2025	T7 single construction	Aggregate	Aggregate	DSL	127.7360417	8937.988854	577.4896782	0	1.526276892		
YOLO	2025	T7 SWCV	Aggregate	Aggregate	DSL	169.2928302	6894.674187	660.2420376	0	2.354574121		
YOLO	2025	T7 SWCV	Aggregate	Aggregate	NG	0.274934292	11.23336972	1.07224374	0	0		
YOLO	2025	T7 tractor	Aggregate	Aggregate	DSL	335.8468261	42828.20452	4265.254692	0	5.321472505		
YOLO	2025	T7 tractor construction	Aggregate	Aggregate	DSL	108.6424053	7373.053897	491.1680906	0	1.270165871		
YOLO	2025	T7 utility	Aggregate	Aggregate	DSL	9.003513534	182.5696611	103.5404056	0	0.030044809		
YOLO	2025	T7I5	Aggregate	Aggregate	GAS	0.632237481	82.89552252	12.64980752	0.017766407	0		
YOLO	2025	UBUS	Aggregate	Aggregate	GAS	12.99880484	1234.348354	51.99521934	0.217059174	0		
YOLO	2025	UBUS	Aggregate	Aggregate	DSL	38.09825019	3812.045523	152.3930008	0	0.555182173		
YOLO	2025	UBUS	Aggregate	Aggregate	NG	125.4586613	12505.13413	501.8346453	0	0		
TOTAL							7,774,566		229.59	93.24	24.1	0.04
Total (Gas)							6,647,618				29.0	0.03
Total (Diesel)							961,606				10.3	0.10
Annual VMT							445,794					
							Mix (%)	Miles	Gallons			
Gas							95.4%	425,275	14,688			
Diesel							4.6%	20,520	1,990			

Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
All Project Land Uses	0.50014	0.037139	0.211039	0.110788	0.018036	0.004853	0.065762	0.042724	0.001016	0.001558	0.005534	0.000732	0.000681

Gas 95.4%
Diesel 4.6%

Energy Calculations Summary

Construction Fuel Usage Summary

	Diesel	Gasoline	Diesel	Diesel
Construction Year	Off-road Equipment (gallons)	On-road (gallons)	On-road (gallons)	Combined
Phase 2				
2021	14,471	4,981	55	14,526
2022	12,560	4,702	53	12,613
Phase 3				
2022	4,656	2,489	28	4,684
2023	3,551	3,035	27	3,578
TOTAL	35,238	15,208	163	35,401

Total Gasoline	15,208	gallons
Total Diesel	35,401	gallons

2021-2023 Construction Offroad Equipment

Phase 2 - 2021

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of days	Average Daily Factor	Diesel Fuel Usage
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40	5	0.6	356
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37	5	0.6	172
Grading	Excavators	1	8.00	158	0.38	60	0.6	865
Grading	Graders	1	8.00	187	0.41	60	0.6	1,104
Grading	Rubber Tired Dozers	1	8.00	247	0.40	60	0.6	1,423
Grading	Tractors/Loaders/Backhoes	3	8.00	97	0.37	60	0.6	1,550
Building Construction	Bore/Drill Rigs	1	8.00	221	0.50	110	0.6	2,917
Building Construction	Forklifts	3	8.00	89	0.20	110	0.6	1,410
Building Construction	Generator Sets	1	8.00	84	0.74	110	0.6	1,641
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37	110	0.6	2,487
Building Construction	Welders	1	8.00	46	0.45	110	0.6	546
TOTAL								14,471

Phase 2 - 2022

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of days	Average Daily Factor	Diesel Fuel Usage
Building Construction	Bore/Drill Rigs	1	8.00	221	0.50	152	0.6	4,031
Building Construction	Forklifts	3	8.00	89	0.20	152	0.6	1,948
Building Construction	Generator Sets	1	8.00	84	0.74	152	0.6	2,268
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37	152	0.6	3,437
Building Construction	Welders	1	8.00	46	0.45	152	0.6	755
Architectural Coating	Air Compressors	1	6.00	78	0.48	18	0.6	121
TOTAL								12,560

	Year	Start Date	End Date	Network Days
Phase 2				
Site Preparation	2021	5/3/2021	5/7/2021	5
Grading	2021	5/8/2021	7/30/2021	60
Building Construction	2021	8/2/2021	12/31/2021	110
Building Construction	2022	1/1/2022	8/2/2022	152
Architectural Coating	2022	8/3/2022	8/26/2022	18
Phase 3				
Site Preparation	2022	8/29/2022	8/31/2022	3
Grading	2022	9/1/2022	11/23/2022	60
Building Construction	2022	11/24/2022	12/31/2022	27
Building Construction	2023	1/1/2023	5/24/2023	103
Architectural Coating	2023	5/25/2023	6/7/2023	10

Phase 3 - 2022

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of days	Average Daily Factor	Diesel Fuel Usage
Site Preparation	Graders	1	8.00	187	0.41	3	0.6	55
Site Preparation	Scrapers	1	8.00	367	0.48	3	0.6	127
Site Preparation	Tractors/Loaders/Backhoes	1	7.00	97	0.37	3		
Grading	Graders	1	8.00	187	0.41	60	0.6	1,104
Grading	Rubber Tired Dozers	1	8.00	247	0.40	60	0.6	1,423
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37	60	0.6	1,034
Building Construction	Forklifts	2	7.00	89	0.20	27	0.6	202
Building Construction	Generator Sets	1	8.00	84	0.74	27	0.6	403
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37	27	0.6	174
Building Construction	Welders	1	8.00	46	0.45	27	0.6	134
TOTAL								4,656

Phase 3 - 2023

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of days	Average Daily Factor	Diesel Fuel Usage
Building Construction	Forklifts	2	7.00	89	0.20	103	0.6	770
Building Construction	Generator Sets	1	8.00	84	0.74	103	0.6	1,537
Building Construction	Tractors/Loaders/Backhoes	1	6.00	97	0.37	103	0.6	665
Building Construction	Welders	1	8.00	46	0.45	103	0.6	512
Architectural Coating	Air Compressors	1	6.00	78	0.48	10	0.6	67
TOTAL								3,551

Trips and VMT

Phase 2 - 2021

Phase Name	Daily Worker Trip	Days per Year	Total Worker Trips	Total Vendor Trips	Total Hauling Trips	Worker Trip Length (miles)	Vendor Trip Length (miles)	Haul Trip Length (miles)	Total Worker Trip Length (miles)	Total Vendor Trip Length (miles)	Total Haul Trip Length (miles)	Total gallons of gasoline	Total gallons of diesel
Site Preparation	40	5	200	0	0	20.00	9.00	20.00	4000	0	0	142	0
Grading	40	60	2400	0	0	20.00	9.00	20.00	48000	0	0	1,708	0
Building Construction	40	110	4400	32	0	20.00	9.00	20.00	88000	288	0	3,131	55
TOTAL												4,981	55

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).

Phase 2 - 2022

Phase Name	Daily Worker Trip	Days per Year	Total Worker Trips	Total Vendor Trips	Total Hauling Trips	Worker Trip Length (miles)	Vendor Trip Length (miles)	Haul Trip Length (miles)	Total Worker Trip Length (miles)	Total Vendor Trip Length (miles)	Total Haul Trip Length (miles)	Total gallons of gasoline	Total gallons of diesel
Building Construction	40	152	6080	32	0	20.00	9.00	20.00	121600	288	0	4,204	53
Architectural Coating	40	18	720	0	0	20.00	9.00	20.00	14,400.00	0.00	0	498	0
TOTAL												4,702	53

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).

Phase 3 - 2022

Phase Name	Daily Worker Trip	Days per Year	Total Worker Trips	Total Vendor Trips	Total Hauling Trips	Worker Trip Length (miles)	Vendor Trip Length (miles)	Haul Trip Length (miles)	Total Worker Trip Length (miles)	Total Vendor Trip Length (miles)	Total Haul Trip Length (miles)	Total gallons of gasoline	Total gallons of diesel
Site Preparation	40	3	120	0	0	20.00	9.00	20.00	2400	0	0	83	0
Grading	40	60	2400	0	0	20.00	9.00	20.00	48000	0	0	1,660	0
Building Construction	40	27	1080	17	0	20.00	9.00	20.00	21600	153	0	747	28
TOTAL												2,489	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).

Phase 3 - 2023

Phase Name	Daily Worker Trip	Days per Year	Total Worker Trips	Total Vendor Trips	Total Hauling Trips	Worker Trip Length (miles)	Vendor Trip Length (miles)	Haul Trip Length (miles)	Total Worker Trip Length (miles)	Total Vendor Trip Length (miles)	Total Haul Trip Length (miles)	Total gallons of gasoline	Total gallons of diesel
Building Construction	40	103	4120	17	0	20.00	9.00	20.00	82400	153	0	2,767	27
Architectural Coating	40	10	400	0	0	20.00	9.00	20.00	8,000.00	0.00	0	269	0
TOTAL												3,035	27

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: YOLO

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. Note 'day' in the unit is operation day.

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
YOLO	2021	LDA	Aggregated	Aggregated	GAS	84943.89113	3651074.405	398916.2431	117.8478875	0.00	30.98	28.11	5.28
YOLO	2021	LDT1	Aggregated	Aggregated	GAS	10690.02015	364802.1464	48399.72026	13.90637884	0.00	26.23		
YOLO	2021	LDT2	Aggregated	Aggregated	GAS	32964.42715	1187420.308	152950.0086	48.99853064	0.00	24.23		
YOLO	2021	T7 tractor construction	Aggregated	Aggregated	DSL	93.23312988	6475.859058	421.5033553	0.00	1.227459935	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: YOLO

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. Note 'day' in the unit is operation day.

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
YOLO	2022	LDA	Aggregated	Aggregated	GAS	87261.73334	3727942.447	410367.3055	116.9643105	0.00	31.87	28.92	5.40
YOLO	2022	LDT1	Aggregated	Aggregated	GAS	10855.35294	368733.0532	49254.24735	13.70587979	0.00	26.90		
YOLO	2022	LDT2	Aggregated	Aggregated	GAS	33709.95979	1200981.786	156383.4611	47.96519418	0.00	25.04		
YOLO	2022	T7 tractor construction	Aggregated	Aggregated	DSL	97.56302404	6730.143699	441.0786385	0.00	1.246751666	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: YOLO

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. Note 'day' in the unit is operation day.

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
YOLO	2023	LDA	Aggregated	Aggregated	GAS	89564.79458	3805359.029	421637.5506	115.9716328	0.00	32.81	29.78	5.68
YOLO	2023	LDT1	Aggregated	Aggregated	GAS	11036.22416	373423.138	50168.40773	13.52114934	0.00	27.62		
YOLO	2023	LDT2	Aggregated	Aggregated	GAS	34446.05016	1215648.995	159759.0926	46.95422164	0.00	25.89		
YOLO	2023	T7 tractor construction	Aggregated	Aggregated	DSL	102.5673401	6986.918641	463.7029566	0.00	1.230920033	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).