

Appendix K  
**Supplemental Greenhouse Gas  
and Energy Modeling Data and  
Calculations**

## **K.1 Supplemental GHG Modeling Data and Calculations**

Harvard Westlake

Construction Annual GHG

Year	Metric Tons/Year			Total
	On-Road Mobile Sources	CalEEMod	Water + Construction Office	
2022	1,880	765.54	36	2,682
2023	1,385	3,290.58	71	4,747
2024	1,575	2,922.44	72	4,570
<b>Total</b>	<b>4,840</b>	<b>6,979</b>	<b>180</b>	<b>11,999</b>
<b>Amortized - 30 years</b>	<b>161</b>	<b>233</b>	<b>6</b>	<b>400.0</b>

Harvard Westlake  
Total On-Road Emissions

Harvard Westlake  
Total On-Road Emissions

Construction Phase	314 Max construction days per year					Regional Emissions (MT/yr) Total CO2e
	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Idling per Day (minutes)	
<u>Demolition</u>	2022					
Total Haul Trips	3026					
Hauling	150	21	8	32	15	168.96
Vendor	0	53	8	6.9	15	0.00
Worker	80	53	8	14.7	0	18.66
					Total	187.62
<u>Demolition-116 trips</u>	2022					Gradi
Total Haul Trips	116					
Hauling	116	1	8	32	15	6.48
Vendor	0	1	8	6.9	15	0.00
Worker	80	1	8	14.7	0	0.35
					Total	6.83
<u>Site Preparation-1</u>	2022					
Total Haul Trips	1866					
Hauling	102	19	8	32	15	104.19
Vendor	0	27	8	6.9	15	0.00
Worker	80	27	8	14.7	0	9.50
					Total	113.70
<u>Grading Excavation - 2022(150 Truck Trips)</u>	2022					
Total Haul Trips	3450					
Hauling	150	23	8	32	15	192.64
Vendor	0	27	8	6.9	15	0.00
Worker	70	27	8	14.7	0	8.32
					Total	200.95
<u>Grading Excavation - 2022(300 Truck Trips)</u>	2022					
Total Haul Trips	23692					
Hauling	300	87	8	32	15	1322.89
Vendor	0	105	8	6.9	15	0.00
Worker	70	105	8	14.7	0	32.34
					Total	1355.23
<u>Grading Excavation - 2023</u>	2023					
Total Haul Trips	0					
Hauling	0	49	8	32	15	0.00
Vendor	0	49	8	6.9	15	0.00
Worker	70	49	8	14.7	0	14.69
					Total	14.69
<u>Utilities-2023</u>	2023					
Total Haul Trips	0					
Hauling	0	285	8	6.9	15	0.00
Vendor	6	285	8	6.9	15	21.20
Worker	70	285	8	14.7	0	85.47
					Total	106.67
<u>Utilities-2024</u>	2024					
Total Haul Trips	0					
Hauling	0	83	8	6.9	15	0.00
Vendor	6	83	8	6.9	15	6.09
Worker	70	83	8	14.7	0	24.36
					Total	30.45
<u>Foundations-2022-No Truck Trips</u>	2022					
Total Haul Trips	0					
Hauling	0	26	8	6.9	15	0.00
Vendor	0	26	8	6.9	15	0.00
Worker	200	26	8	14.7	0	22.88
					Total	22.88
<u>Foundations-2023-No Truck Trips</u>	2023					
Total Haul Trips	0					
Hauling	0	26	8	6.9	15	0.00
Vendor	0	26	8	6.9	15	0.00
Worker	200	26	8	14.7	0	22.28
					Total	22.28
<u>Foundations-2023-100 Truck Trips</u>	2023					
Total Haul Trips	2400					
Hauling	100	24	8	6.9	15	41.19
Vendor	0	24	8	6.9	15	0.00
Worker	200	24	8	14.7	0	20.56
					Total	61.76
<u>Foundations-2023-200 Truck Trips</u>	2023					
Total Haul Trips	15800					
Hauling	200	79	8	6.9	15	271.19
Vendor	0	79	8	6.9	15	0.00
Worker	200	79	8	14.7	0	67.69
					Total	338.88
<u>Foundations-2023-200 Truck Trips With Vendors</u>	2023					
Total Haul Trips	10270					
Hauling	130	79	8	6.9	15	176.27
Vendor	70	79	8	6.9	15	68.57
Worker	200	79	8	14.7	0	67.69
					Total	312.53
<u>Foundations-2023-200 Truck Trips</u>	2023					
Total Haul Trips	10,400					
Hauling	200	52	8	6.9	15	178.51
Vendor	0	52	8	6.9	15	0.00
Worker	200	52	8	14.7	0	44.55
					Total	223.06
<u>Foundations-2023-No Truck Trips</u>	2023					
Total Haul Trips	0					
Hauling	0	26	8	6.9	15	0.00
Vendor	0	26	8	6.9	15	0.00
Worker	200	26	8	14.7	0	22.28
					Total	22.28
<u>Site Preparation-2</u>	2023					
Total Haul Trips	0					
Hauling	102	1	8	32	15	0.00
Vendor	0	1	8	6.9	15	0.00
Worker	80	1	8	14.7	0	0.34
					Total	0.34

Harvard Westlake  
Running Emissions

	Running Emissions Factor (grams/mile)		
	CO2	CH4	N2O
	2022Hauling Hauling	1438.05743	0.07903854
2022Vendor Vendor	1241.05151	0.04153519	0.17850954
2022Worker Worker	297.421819	0.00429787	0.0062225
2023Hauling Hauling	1361.03203	0.07739449	0.21628901
2023Vendor Vendor	1182.89475	0.0395565	0.16983582
2023Worker Worker	289.863893	0.00377192	0.00569037
2024Hauling Hauling	1342.26891	0.07772514	0.21337247
2024Vendor Vendor	1165.94656	0.03960974	0.16765887
2024Worker Worker	283.595381	0.0033661	0.00525653
2025Hauling Hauling	1317.8866	0.07825682	0.20957126
2025Vendor Vendor	1144.64896	0.03978177	0.16478939
2025Worker Worker	276.824153	0.00298302	0.00488481
GWP	1	25	290

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Regional Emissions (MT/year)			
					CO2	CH4	N2O	CO2e
<b>Demolition</b>	<b>2022</b>							
Total Haul Trips	3026							
Hauling	150	21	8	32	139.25	0.19	6.41	145.85
Vendor	0	53	8	6.9	0.00	0.00	0.00	0.00
Worker	80	53	8	14.7	18.54	0.01	0.11	18.66
<b>Demolition-116 trips</b>	<b>2022</b>							
Total Haul Trips	116							
Hauling	116	1	8	32	5.34	0.01	0.25	5.59
Vendor	0	1	8	6.9	0.00	0.00	0.00	0.00
Worker	80	1	8	14.7	0.35	0.00	0.00	0.35
<b>Site Preparation-1</b>	<b>2022</b>							
Total Haul Trips	1866							
Hauling	102	19	8	32	85.87	0.12	3.95	89.94
Vendor	0	27	8	6.9	0.00	0.00	0.00	0.00
Worker	80	27	8	14.7	9.44	0.00	0.06	9.50
<b>Grading Excavation - 2022(150 Truck Trips)</b>	<b>2022</b>							
Total Haul Trips	3450							
Hauling	150	23	8	32	158.76	0.22	7.31	166.29
Vendor	0	27	8	6.9	0.00	0.00	0.00	0.00
Worker	70	27	8	14.7	8.26	0.00	0.05	8.32
<b>Grading Excavation - 2022(300 Truck Trips)</b>	<b>2022</b>							
Total Haul Trips	23692							
Hauling	300	87	8	32	1090.25	1.50	50.20	1141.96
Vendor	0	105	8	6.9	0.00	0.00	0.00	0.00
Worker	70	105	8	14.7	32.13	0.01	0.19	32.34
<b>Grading Excavation - 2023</b>	<b>2023</b>							
Total Haul Trips	0							
Hauling	0	49	8	32	0.00	0.00	0.00	0.00
Vendor	0	49	8	6.9	0.00	0.00	0.00	0.00
Worker	70	49	8	14.7	14.61	0.00	0.08	14.69
<b>Grading Excavation - 2023(200 Truck Trips)</b>	<b>2023</b>							
Total Haul Trips	0							
Hauling	0	23	8	32	0.00	0.00	0.00	0.00
Vendor	0	23	8	6.9	0.00	0.00	0.00	0.00
Worker	70	23	8	14.7	6.86	0.00	0.04	6.90
<b>Utilities-2023</b>	<b>2023</b>							
Total Haul Trips	0							
Hauling	0	285	8	6.9	0.00	0.00	0.00	0.00
Vendor	6	285	8	6.9	13.96	0.01	0.58	14.55
Worker	70	285	8	14.7	84.95	0.03	0.48	85.47
<b>Utilities-2024</b>	<b>2024</b>							
Total Haul Trips	0							
Hauling	0	83	8	6.9	0.00	0.00	0.00	0.00
Vendor	6	83	8	6.9	4.01	0.00	0.17	4.18
Worker	70	83	8	14.7	24.22	0.01	0.13	24.36
<b>Foundations-2022-No Truck Trips</b>	<b>2022</b>							
Total Haul Trips	0							
Hauling	0	26	8	6.9	0.00	0.00	0.00	0.00
Vendor	0	26	8	6.9	0.00	0.00	0.00	0.00
Worker	200	26	8	14.7	22.73	0.01	0.14	22.88
<b>Foundations-2023-No Truck Trips</b>	<b>2023</b>							
Total Haul Trips	0							
Hauling	0	26	8	6.9	0.00	0.00	0.00	0.00
Vendor	0	26	8	6.9	0.00	0.00	0.00	0.00
Worker	200	26	8	14.7	22.14	0.01	0.13	22.28
<b>Foundations-2023-100 Truck Trips</b>	<b>2023</b>							
Total Haul Trips	2400							
Hauling	100	24	8	6.9	22.54	0.03	1.04	23.61
Vendor	0	24	8	6.9	0.00	0.00	0.00	0.00
Worker	200	24	8	14.7	20.44	0.01	0.12	20.56
<b>Foundations-2023-200 Truck Trips</b>	<b>2023</b>							
Total Haul Trips	15800							
Hauling	200	79	8	6.9	148.38	0.21	6.84	155.43
Vendor	0	79	8	6.9	0.00	0.00	0.00	0.00
Worker	200	79	8	14.7	67.28	0.02	0.38	67.69
<b>Foundations-2023-200 Truck Trips With Vendors</b>	<b>2023</b>							
Total Haul Trips	10270							
Hauling	130	79	8	6.9	96.45	0.14	4.44	101.03
Vendor	70	79	8	6.9	45.14	0.04	1.88	47.05
Worker	200	79	8	14.7	67.28	0.02	0.38	67.69
<b>Foundations-2023-200 Truck Trips</b>	<b>2023</b>							
Total Haul Trips	10400							
Hauling	200	52	8	6.9	97.67	0.14	4.50	102.31
Vendor	0	52	8	6.9	0.00	0.00	0.00	0.00
Worker	200	52	8	14.7	44.29	0.01	0.25	44.55
<b>Foundations-2023-No Truck Trips</b>	<b>2023</b>							
Total Haul Trips	0							
Hauling	0	26	8	6.9	0.00	0.00	0.00	0.00
Vendor	0	26	8	6.9	0.00	0.00	0.00	0.00
Worker	200	26	8	14.7	22.14	0.01	0.13	22.28
<b>Site Preparation-2</b>	<b>2023</b>							
Total Haul Trips	0							
Hauling	102	1	8	32	0.00	0.00	0.00	0.00

Harvard Westlake  
Running Emissions

	Running Emissions Factor (grams/mile)		
	CO2	CH4	N2O
	2022Hauling Hauling	1438.05743	0.07903854
2022Vendor Vendor	1241.05151	0.04153519	0.17850954
2022Worker Worker	297.421819	0.00429787	0.0062225
2023Hauling Hauling	1361.03203	0.07739449	0.21628901
2023Vendor Vendor	1182.89475	0.0395565	0.16983582
2023Worker Worker	289.682893	0.00377192	0.00569037
2024Hauling Hauling	1342.26891	0.07772514	0.21337247
2024Vendor Vendor	1165.94656	0.03960974	0.16765887
2024Worker Worker	283.595381	0.0033661	0.00525653
2025Hauling Hauling	1317.8866	0.07825682	0.20957126
2025Vendor Vendor	1144.64896	0.03978177	0.16478939
2025Worker Worker	276.824153	0.00298302	0.00488481
GWP	1	25	290

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	One-Way Trip Distance per Day (miles)	Regional Emissions (MT/year)			
					CO2	CH4	N2O	CO2e
Vendor	0	1	8	6.9	0.00	0.00	0.00	0.00
Worker	80	1	8	14.7	0.34	0.00	0.00	0.34
<u>Pavings</u>	<u>2024</u>							
Total Haul Trips	0							
Hauling	0	28	8	6.9	0.00	0.00	0.00	0.00
Vendor	0	28	8	6.9	0.00	0.00	0.00	0.00
Worker	0	28	8	14.7	0.00	0.00	0.00	0.00

Harvard Westlake  
Idling Emissions

	Idling Emissions Factor		
	(grams/minute)		
	CO2	CH4	N2O
2022Hauling Hauling	486.5663	0.01105837	0.07681957
2022Vendor Vendor	258.490517	0.00651153	0.04053409
2022Worker Worker	0	0	0
2023Hauling Hauling	466.791389	0.01109333	0.07373941
2023Vendor Vendor	248.201759	0.0065238	0.03888991
2023Worker Worker	0	0	0
2024Hauling Hauling	461.877718	0.01113899	0.07294934
2024Vendor Vendor	245.284071	0.00652813	0.03847475
2024Worker Worker	0	0	0
2025Hauling Hauling	455.764425	0.01119346	0.07199173
2025Vendor Vendor	241.878593	0.00653364	0.03796772
2025Worker Worker	0	0	0
GWP	1	25	290

Construction Phase	Daily One-Way Trips	Haul Days per Phase (days)	Work Hours per Day (hours/day)	Idling minutes per Day (min)	Regional Emissions (MT/year)			
					CO2	CH4	N2O	CO2e
<b>Demo/ition</b>								
<b>2022</b>								
Total Haul Trips	3026							
Hauling	150	21	8	15	22.09	0.01	1.01	23.11
Vendor	0	53	8	15	0.00	0.00	0.00	0.00
Worker	80	53	8	0	0.00	0.00	0.00	0.00
<b>Demo/ition-116 trips</b>								
<b>2022</b>								
Total Haul Trips	116							
Hauling	116	1	8	15	0.85	0.00	0.04	0.89
Vendor	0	1	8	15	0.00	0.00	0.00	0.00
Worker	80	1	8	0	0.00	0.00	0.00	0.00
<b>Site Preparation-1</b>								
<b>2022</b>								
Total Haul Trips	1866							
Hauling	102	19	8	15	13.62	0.01	0.62	14.25
Vendor	0	27	8	15	0.00	0.00	0.00	0.00
Worker	80	27	8	0	0.00	0.00	0.00	0.00
<b>Grading Excavation - 2022(150 Truck Trips)</b>								
<b>2022</b>								
Total Haul Trips	3450							
Hauling	150	23	8	15	25.18	0.01	1.15	26.35
Vendor	0	27	8	15	0.00	0.00	0.00	0.00
Worker	70	27	8	0	0.00	0.00	0.00	0.00
<b>Grading Excavation - 2022(300 Truck Trips)</b>								
<b>2022</b>								
Total Haul Trips	23692							
Hauling	300	87	8	15	172.92	0.10	7.92	180.93
Vendor	0	105	8	15	0.00	0.00	0.00	0.00
Worker	70	105	8	0	0.00	0.00	0.00	0.00
<b>Grading Excavation - 2023</b>								
<b>2023</b>								
Total Haul Trips	0							
Hauling	0	49	8	15	0.00	0.00	0.00	0.00
Vendor	0	49	8	15	0.00	0.00	0.00	0.00
Worker	70	49	8	0	0.00	0.00	0.00	0.00
<b>Grading Excavation - 2023(200 Truck Trips)</b>								
<b>2023</b>								
Total Haul Trips	0							
Hauling	0	23	8	15	0.00	0.00	0.00	0.00
Vendor	0	23	8	15	0.00	0.00	0.00	0.00
Worker	70	23	8	0	0.00	0.00	0.00	0.00
<b>Utilities-2023</b>								
<b>2023</b>								
Total Haul Trips	0							
Hauling	0	285	8	15	0.00	0.00	0.00	0.00
Vendor	6	285	8	15	6.36	0.00	0.29	6.65
Worker	70	285	8	0	0.00	0.00	0.00	0.00
<b>Utilities-2024</b>								
<b>2024</b>								
Total Haul Trips	0							
Hauling	0	83	8	15	0.00	0.00	0.00	0.00
Vendor	6	83	8	15	1.83	0.00	0.08	1.92
Worker	70	83	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2022-No Truck Trips</b>								
<b>2022</b>								
Total Haul Trips	0							
Hauling	0	26	8	15	0.00	0.00	0.00	0.00
Vendor	0	26	8	15	0.00	0.00	0.00	0.00
Worker	200	26	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2023-No Truck Trips</b>								
<b>2023</b>								
Total Haul Trips	0							
Hauling	0	26	8	15	0.00	0.00	0.00	0.00
Vendor	0	26	8	15	0.00	0.00	0.00	0.00
Worker	200	26	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2023-100 Truck Trips</b>								
<b>2023</b>								
Total Haul Trips	2400							
Hauling	100	24	8	15	16.80	0.01	0.77	17.58
Vendor	0	24	8	15	0.00	0.00	0.00	0.00
Worker	200	24	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2023-200 Truck Trips</b>								
<b>2023</b>								
Total Haul Trips	15800							
Hauling	200	79	8	15	110.63	0.07	5.07	115.76
Vendor	0	79	8	15	0.00	0.00	0.00	0.00
Worker	200	79	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2023-200 Truck Trips With Vendors</b>								
<b>2023</b>								
Total Haul Trips	10270							
Hauling	130	79	8	15	71.91	0.04	3.29	75.25
Vendor	70	79	8	15	20.57	0.01	0.94	21.52
Worker	200	79	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2023-300 Truck Trips</b>								
<b>2023</b>								
Total Haul Trips	10400							
Hauling	200	52	8	15	72.82	0.04	3.34	76.20
Vendor	0	52	8	15	0.00	0.00	0.00	0.00
Worker	200	52	8	0	0.00	0.00	0.00	0.00
<b>Foundations-2023-No Truck Trips</b>								
<b>2023</b>								
Total Haul Trips	0							
Hauling	0	26	8	15	0.00	0.00	0.00	0.00
Vendor	0	26	8	15	0.00	0.00	0.00	0.00
Worker	200	26	8	0	0.00	0.00	0.00	0.00
<b>Site Preparation-2</b>								
<b>2023</b>								
Total Haul Trips	102							
Hauling	0	1	8	15	0.00	0.00	0.00	0.00
Vendor	0	1	8	15	0.00	0.00	0.00	0.00
Worker	80	1	8	0	0.00	0.00	0.00	0.00

Harvard Westlake

Greenhouse Gas Emissions Summary

Project Operations Summary <b>Without GHG Reduction</b> <b>Characteristics, Features, and Measures</b> (Full Buildout Year)	
Category	MTCO <sub>2</sub> e/yr
Mobile	1,865
Area	0.02
Electricity	981
Natural Gas	94
Waste	19
Water	73
Construction	400
<b>Project Subtotal</b>	<b>3,431</b>
Existing	1,186
<b>Project Net Total GHG Emissions</b>	<b>2,245</b>

Project Operations Summary <b>With GHG Reduction</b> <b>Characteristics, Features, and Measures</b> (Full Buildout Year)	
Category	MTCO <sub>2</sub> e/yr
Mobile	1,420
Area	0.02
Electricity	717
Natural Gas	93
Waste	19
Water	64
Construction	400
<b>Project Subtotal</b>	<b>2,713</b>
Existing	1,186
<b>Project Net Total GHG Emissions</b>	<b>1,527</b>

Existing Emissions Summary	
Category	MTCO <sub>2</sub> e/yr
On Road Mobile Sources	890
Area	0.01
Energy (Electricity and Natural Gas)	234
Water Conveyance and Wastewater Treatment	14
Solid Waste	47
<b>Total Existing Emissions</b>	<b>1,186</b>

MTCO<sub>2</sub>e=Metric Tons Carbon Dioxide equivalents



Solar Assumptions

System Info 426.0 Panels

Generate	281,000 kwh/year
	281.0 mwh/year
Carbon Intensity f	626.48 lbs CO2/MWh
CH4IntensityFact	0.029 lbs CO2/MWh
N2OIntensityFact	0.006 lbs N2O/MWh
CO2e lbs/year	176747
lbs/metric ton	2204.623
CO2e MT/year	80.17

Source: Gensler

**Harvard Westlake  
Pole Lighting and LED Screens**

**Pole Lighting  
Based on Illuminance Calculations From Lighting Analysis**

**Circuit Summary**

Circuit	Description	Load (kW)	Fixture Qty
A	Soccer	39.8	42
B	Pool	9.13	12
C	Tennis 1-2	8.2	12
D	Tennis 3-4	8.2	12
E	Tennis 5-6	8.2	12
F	Tennis 7-8	8.2	12
G	Soccer 2	75.28	68
H	Track	1.25	12
I	Upper Soccer Egress	0.8	2
J	Pool/Pool Egress	3.25	4
K	Lower Soccer Egress	1.6	4
		163.910	

Assumptions		
Weekdays+Sundays/Year		313
Saturdays (when facilities will be used)		10
Lighting # hours per day		4
hours operating per year		1292
Energy usage per year		211772 kwh/year

**LED Screens**

LED Screen	Dimensions (ft)		Diagonal	Power Usage Watts
Field A	25	18	30.8	739.2
Field B	25	18	30.8	739.2
			Total	1478.4

Assumptions		
Weekdays+Sundays/Year		313
Saturdays (when facilities will be used)		10
Screens # hours per day		4
hours operating per year		1292
Energy usage per year		1910093 wh/year 1910 kwh/year

LED scaled from 50 inches diameter screen using 100 W  
[http://energyusecalculator.com/electricity\\_lcdleddisplay.htm](http://energyusecalculator.com/electricity_lcdleddisplay.htm)  
 Assumes LED no used on sundays since no events

Diagonal (f	Power Usage
4.17	100
30.8	739.2

**Total Energy (Pole Lighting and LED Screens)**

Total Energy Usage	213682 kwh/year 213.7 mwh/year
Carbon Intensity Factor	626.48 lbs CO2/MWh
CH4IntensityFactor	0.029 lbs CO2/MWh
N2OIntensityFactor	0.006 lbs N2O/MWh
CO2e lbs/year	134404.3
lbs/metric ton	2204.623
CO2e MT/year	60.96

**Harvard Westlake  
Pole Lighting and LED Screens**

**Pole Lighting - BAU  
Based on Illuminance Calculations From Lighting Analysis**

**Circuit Summary**

Circuit	Description	Load (kW)	Fixture Qty
A	Soccer	39.8	42
B	Pool	9.13	12
C	Tennis 1-2	8.2	12
D	Tennis 3-4	8.2	12
E	Tennis 5-6	8.2	12
	Tennis 7-8	8.2	12
	Soccer 2	75.28	68
F	Track	1.25	12
G	Upper Soccer Egress	0.8	2
H	Pool/Pool Egress	3.25	4
	Lower Soccer Egress	1.6	4
		163.910	

Assumptions		
	Weekdays+Sundays/Year	313
	Saturdays (when facilities will be used)	10
	Lighting # hours per day	4
	hours operating per year	1292
	Energy usage per year	211771.7 kwh/year

**LED Screens**

LED Screen	Dimensions (ft)		Diagonal	Power Usage Watts
Field A	25	18	30.8	739.2
Field B	25	18	30.8	739.2
			Total	1478.4

Assumptions		
	Weekdays+Sundays/Year	313
	Saturdays (when facilities will be used)	10
	Screens # hours per day	4
	hours operating per year	1292
	Energy usage per year	1910093 wh/year 1910 kwh/year

LED scaled from 50 inches diameter screen using 100 W  
[http://energyusecalculator.com/electricity\\_lcdleddisplay.htm](http://energyusecalculator.com/electricity_lcdleddisplay.htm)  
 Assumes LED no used on sundays since no events

Diagonal (f	Power Usage
4.17	100
30.8	739.2

**Total Energy (Pole Lighting and LED Screens)**

Total Energy Usage	213682 kwh/year 213.7 mwh/year
Carbon Intensity Factor	740.03 lbs CO2/MWh
CH4IntensityFactor	0.029 lbs CO2/MWh
N2OIntensityFactor	0.006 lbs N2O/MWh
CO2e lbs/year	158667.8
lbs/metric ton	2204.623
CO2e MT/year	71.97

Harvard Westlake - Construction - South Coast AQMD Air District, Annual

**Harvard Westlake - Construction**  
**South Coast AQMD Air District, Annual**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.18	1000sqft	0.05	180.00	0
Unrefrigerated Warehouse-No Rail	25.42	1000sqft	0.30	25,420.00	0
Enclosed Parking with Elevator	503.00	Space	1.00	223,580.00	0
Other Non-Asphalt Surfaces	140.06	1000sqft	3.16	140,063.60	0
Parking Lot	29.00	Space	0.85	37,026.00	0
City Park	10.61	Acre	10.61	462,171.60	0
Health Club	91.95	1000sqft	0.68	91,954.00	0
Recreational Swimming Pool	12.67	1000sqft	0.10	12,672.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	31
<b>Climate Zone</b>	12			<b>Operational Year</b>	2025
<b>Utility Company</b>	Los Angeles Department of Water & Power				
<b>CO2 Intensity (lb/MW hr)</b>	1227.89	<b>CH4 Intensity (lb/MW hr)</b>	0.029	<b>N2O Intensity (lb/MW hr)</b>	0.006

**1.3 User Entered Comments & Non-Default Data**

Project Characteristics -

Land Use - existing uses to remain not included modeling. See construction assumptions

Construction Phase - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Off-road Equipment - see construction assumptions

Trips and VMT - construction mobile emissions calculated outside of CalEEMo.d

Demolition -

Grading - see construction assumptions

Architectural Coating - see construction assumptions

Construction Off-road Equipment Mitigation -

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	ConstArea_Nonresidential_Exterior	58,777.00	128,809.00
tblArchitecturalCoating	ConstArea_Nonresidential_Interior	176,331.00	386,426.00
tblArchitecturalCoating	ConstArea_Parking	24,040.00	15,636.00
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	20.00	310.00
tblConstructionPhase	NumDays	300.00	312.00
tblConstructionPhase	NumDays	300.00	446.00
tblConstructionPhase	NumDays	300.00	392.00
tblConstructionPhase	NumDays	300.00	365.00
tblConstructionPhase	NumDays	20.00	53.00
tblConstructionPhase	NumDays	30.00	145.00
tblConstructionPhase	NumDays	20.00	28.00

tblConstructionPhase	NumDays	10.00	27.00
tblConstructionPhase	NumDays	10.00	26.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblConstructionPhase	NumDaysWeek	5.00	6.00
tblGrading	AcresOfGrading	0.00	75.00
tblGrading	AcresOfGrading	0.00	16.75
tblGrading	AcresOfGrading	65.00	16.75
tblGrading	MaterialExported	0.00	190,000.00
tblGrading	MaterialExported	0.00	6,532.00
tblLandUse	LandUseSquareFeet	201,200.00	223,580.00
tblLandUse	LandUseSquareFeet	140,060.00	140,063.60
tblLandUse	LandUseSquareFeet	11,600.00	37,026.00
tblLandUse	LandUseSquareFeet	91,950.00	91,954.00
tblLandUse	LandUseSquareFeet	12,670.00	12,672.00
tblLandUse	LotAcreage	0.00	0.05
tblLandUse	LotAcreage	0.58	0.30
tblLandUse	LotAcreage	4.53	1.00
tblLandUse	LotAcreage	3.22	3.16
tblLandUse	LotAcreage	0.26	0.85
tblLandUse	LotAcreage	2.11	0.68
tblLandUse	LotAcreage	0.29	0.10

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	2.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	4.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	6.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	5.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	3.00	1.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	7.00	8.00

tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblOffRoadEquipment	UsageHours	7.00	8.00
tblTripsAndVMT	HaulingTripNumber	817.00	0.00
tblTripsAndVMT	HaulingTripNumber	1,241.00	0.00
tblTripsAndVMT	HaulingTripNumber	31,250.00	0.00
tblTripsAndVMT	VendorTripNumber	163.00	0.00
tblTripsAndVMT	VendorTripNumber	163.00	0.00
tblTripsAndVMT	VendorTripNumber	163.00	0.00
tblTripsAndVMT	VendorTripNumber	163.00	0.00
tblTripsAndVMT	WorkerTripNumber	20.00	0.00
tblTripsAndVMT	WorkerTripNumber	83.00	0.00
tblTripsAndVMT	WorkerTripNumber	25.00	0.00
tblTripsAndVMT	WorkerTripNumber	48.00	0.00
tblTripsAndVMT	WorkerTripNumber	33.00	0.00
tblTripsAndVMT	WorkerTripNumber	417.00	0.00
tblTripsAndVMT	WorkerTripNumber	53.00	0.00
tblTripsAndVMT	WorkerTripNumber	417.00	0.00
tblTripsAndVMT	WorkerTripNumber	35.00	0.00
tblTripsAndVMT	WorkerTripNumber	417.00	0.00
tblTripsAndVMT	WorkerTripNumber	417.00	0.00





Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	6-30-2022	9-29-2022	1.9129	1.9129
2	9-30-2022	12-29-2022	1.8670	1.8670
3	12-30-2022	3-29-2023	2.9361	2.9361
4	3-30-2023	6-29-2023	3.8014	3.8014
5	6-30-2023	9-29-2023	4.6225	4.6225
6	9-30-2023	12-29-2023	5.9724	5.9724
7	12-30-2023	3-29-2024	5.2920	5.2920
8	3-30-2024	6-29-2024	4.3479	4.3479
9	6-30-2024	9-29-2024	4.2639	4.2639
		Highest	5.9724	5.9724

### 3.0 Construction Detail

#### Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation-1	Site Preparation	6/30/2022	7/31/2022	6	27	
2	Demolition	Demolition	7/1/2022	8/31/2022	6	53	
3	Grading	Grading	8/1/2022	1/16/2023	6	145	
4	Foundations	Building Construction	12/2/2022	11/30/2023	6	312	
5	Utilities	Trenching	2/2/2023	4/5/2024	6	368	
6	Building Construction	Building Construction	5/1/2023	10/1/2024	6	446	
7	Site Preparation-2	Site Preparation	9/1/2023	9/30/2023	6	26	
8	Landscape	Building Construction	10/2/2023	12/31/2024	6	392	
9	Pool Area	Building Construction	11/2/2023	12/31/2024	6	365	
10	Architectural Coating	Architectural Coating	1/2/2024	12/27/2024	6	310	
11	Paving	Paving	11/1/2024	12/3/2024	6	28	

Acres of Grading (Site Preparation Phase): 0

**Acres of Grading (Grading Phase): 75**

**Acres of Paving: 5.01**

**Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 386,426; Non-Residential Outdoor: 128,809; Striped Parking Area:**

**OffRoad Equipment**

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Site Preparation-1	Excavators	1	8.00	158	0.38
Site Preparation-1	Graders	0	8.00	187	0.41
Site Preparation-1	Off-Highway Trucks	1	4.40	402	0.38
Site Preparation-1	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation-1	Scrapers	0	8.00	367	0.48
Site Preparation-1	Skid Steer Loaders	2	8.00	65	0.37
Site Preparation-1	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation-1	Trenchers	0	8.00	78	0.50
Demolition	Air Compressors	1	8.00	78	0.48
Demolition	Concrete/Industrial Saws	2	8.00	81	0.73
Demolition	Excavators	3	8.00	158	0.38
Demolition	Off-Highway Trucks	1	4.40	402	0.38
Demolition	Rough Terrain Forklifts	2	8.00	100	0.40
Demolition	Rubber Tired Dozers	0	8.00	247	0.40
Demolition	Skid Steer Loaders	4	8.00	65	0.37
Demolition	Sweepers/Scrubbers	1	8.00	64	0.46
Demolition	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Grading	Air Compressors	2	8.00	78	0.48
Grading	Bore/Drill Rigs	2	8.00	221	0.50
Grading	Excavators	2	8.00	158	0.38
Grading	Graders	0	8.00	187	0.41
Grading	Off-Highway Trucks	2	4.40	402	0.38
Grading	Plate Compactors	0	8.00	8	0.43
Grading	Pumps	2	8.00	84	0.74

Grading	Rubber Tired Dozers	0	8.00	247	0.40
Grading	Scrapers	0	8.00	367	0.48
Grading	Skid Steer Loaders	0	8.00	65	0.37
Grading	Sweepers/Scrubbers	1	8.00	64	0.46
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Foundations	Air Compressors	3	8.00	78	0.48
Foundations	Bore/Drill Rigs	3	8.00	221	0.50
Foundations	Cranes	2	8.00	231	0.29
Foundations	Excavators	1	8.00	158	0.38
Foundations	Forklifts	0	8.00	89	0.20
Foundations	Generator Sets	0	8.00	84	0.74
Foundations	Off-Highway Trucks	1	4.40	402	0.38
Foundations	Plate Compactors	2	8.00	8	0.43
Foundations	Pumps	3	8.00	84	0.74
Foundations	Rough Terrain Forklifts	2	8.00	100	0.40
Foundations	Skid Steer Loaders	4	8.00	65	0.37
Foundations	Sweepers/Scrubbers	0	8.00	64	0.46
Foundations	Tractors/Loaders/Backhoes	6	8.00	97	0.37
Foundations	Welders	0	8.00	46	0.45
Utilities	Air Compressors	1	8.00	78	0.48
Utilities	Dumpers/Tenders	3	8.00	16	0.38
Utilities	Excavators	2	8.00	158	0.38
Utilities	Off-Highway Trucks	2	4.40	402	0.38
Utilities	Plate Compactors	2	8.00	8	0.43
Utilities	Rough Terrain Forklifts	2	8.00	100	0.40
Utilities	Rubber Tired Loaders	2	8.00	203	0.36
Utilities	Signal Boards	0	8.00	6	0.82
Utilities	Skid Steer Loaders	4	8.00	65	0.37
Utilities	Sweepers/Scrubbers	1	8.00	64	0.46
Utilities	Tractors/Loaders/Backhoes	2	8.00	97	0.37

Utilities	Trenchers	0	8.00	78	0.50
Building Construction	Air Compressors	1	8.00	78	0.48
Building Construction	Cement and Mortar Mixers	3	8.00	9	0.56
Building Construction	Concrete/Industrial Saws	0	8.00	81	0.73
Building Construction	Cranes	1	8.00	231	0.29
Building Construction	Forklifts	0	8.00	89	0.20
Building Construction	Generator Sets	4	8.00	84	0.74
Building Construction	Rough Terrain Forklifts	2	8.00	100	0.40
Building Construction	Skid Steer Loaders	0	8.00	65	0.37
Building Construction	Sweepers/Scrubbers	0	8.00	64	0.46
Building Construction	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Building Construction	Welders	0	8.00	46	0.45
Site Preparation-2	Excavators	1	8.00	158	0.38
Site Preparation-2	Graders	1	8.00	187	0.41
Site Preparation-2	Off-Highway Trucks	1	4.40	402	0.38
Site Preparation-2	Rubber Tired Dozers	0	8.00	247	0.40
Site Preparation-2	Scrapers	2	8.00	367	0.48
Site Preparation-2	Skid Steer Loaders	4	8.00	65	0.37
Site Preparation-2	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation-2	Trenchers	1	8.00	78	0.50
Landscape	Cement and Mortar Mixers	1	8.00	9	0.56
Landscape	Cranes	2	8.00	231	0.29
Landscape	Forklifts	1	8.00	89	0.20
Landscape	Generator Sets	0	8.00	84	0.74
Landscape	Graders	1	8.00	187	0.41
Landscape	Off-Highway Trucks	1	4.40	402	0.38
Landscape	Rollers	2	8.00	80	0.38
Landscape	Rough Terrain Forklifts	3	8.00	100	0.40
Landscape	Rubber Tired Loaders	3	8.00	203	0.36
Landscape	Skid Steer Loaders	7	8.00	65	0.37

Landscape	Tractors/Loaders/Backhoes	5	8.00	97	0.37
Landscape	Trenchers	2	8.00	78	0.50
Landscape	Welders	0	8.00	46	0.45
Pool Area	Air Compressors	1	8.00	78	0.48
Pool Area	Cement and Mortar Mixers	0	8.00	9	0.56
Pool Area	Concrete/Industrial Saws	0	8.00	81	0.73
Pool Area	Cranes	1	8.00	231	0.29
Pool Area	Forklifts	0	8.00	89	0.20
Pool Area	Generator Sets	0	8.00	84	0.74
Pool Area	Off-Highway Trucks	1	4.40	402	0.38
Pool Area	Other Construction Equipment	0	8.00	172	0.42
Pool Area	Plate Compactors	1	8.00	8	0.43
Pool Area	Pumps	1	8.00	84	0.74
Pool Area	Rough Terrain Forklifts	1	8.00	100	0.40
Pool Area	Rubber Tired Loaders	0	8.00	203	0.36
Pool Area	Skid Steer Loaders	1	8.00	65	0.37
Pool Area	Tractors/Loaders/Backhoes	1	8.00	97	0.37
Pool Area	Welders	0	8.00	46	0.45
Architectural Coating	Air Compressors	0	6.00	78	0.48
Architectural Coating	Concrete/Industrial Saws	2	8.00	81	0.73
Architectural Coating	Forklifts	2	8.00	89	0.20
Architectural Coating	Rough Terrain Forklifts	3	8.00	100	0.40
Paving	Air Compressors	1	8.00	78	0.48
Paving	Graders	1	8.00	187	0.41
Paving	Pavers	1	8.00	130	0.42
Paving	Paving Equipment	1	8.00	132	0.36
Paving	Plate Compactors	1	8.00	8	0.43
Paving	Pumps	1	8.00	84	0.74
Paving	Rollers	1	8.00	80	0.38
Paving	Sweepers/Scrubbers	1	8.00	64	0.46

Paving	Tractors/Loaders/Backhoes	2	8.00	97	0.37
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### **Trips and VMT**

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation-1	8	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	19	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	13	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Foundations	27	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Utilities	21	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	11	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation-2	14	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Landscape	28	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Pool Area	8	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	7	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	10	0.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

### **3.1 Mitigation Measures Construction**

Water Exposed Area

Reduce Vehicle Speed on Unpaved Roads







### 3.3 Demolition - 2022

#### Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1343	0.0000	0.1343	0.0203	0.0000	0.0203	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0902	0.8447	1.1817	1.9200e-003		0.0413	0.0413		0.0389	0.0389	0.0000	167.9348	167.9348	0.0443	0.0000	169.0429
<b>Total</b>	<b>0.0902</b>	<b>0.8447</b>	<b>1.1817</b>	<b>1.9200e-003</b>	<b>0.1343</b>	<b>0.0413</b>	<b>0.1756</b>	<b>0.0203</b>	<b>0.0389</b>	<b>0.0592</b>	<b>0.0000</b>	<b>167.9348</b>	<b>167.9348</b>	<b>0.0443</b>	<b>0.0000</b>	<b>169.0429</b>

#### Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
<b>Total</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>	<b>0.0000</b>

#### Mitigated Construction On-Site







































































## **K.2 Supplemental Energy Modeling Data and Calculations**

Harvard Westlake  
Construction Energy Analysis

**Annual Fuel Summary**

<b>Heavy-Duty Construction Equipment</b>	
750,984	Total Project Consumption
298,920	Annual Consumption
<b>Haul Trucks</b>	
276,283	Total Project Consumption
109,971	Annual Consumption
<b>Vendor Trucks</b>	
44,887	Total Project Consumption
17,866	Annual Consumption
<b>Workers</b>	
169,978	Total Project Consumption
67,658	Annual Consumption
321,170	Project Consumption of diesel for Haul Trucks and Vendors
127,838	Annual Consumption
1,072,154	Total Gallons Diesel
169,978	Total Gallons Gasoline

2.5 Estimated Project Construction Duration (years)

426,757 Annual Average Gallons Diesel  
67,658 Annual Average Gallons Gasoline

Los Angeles County			Percent of Annual Project Compared to Los Angeles County
Source	Fuel Type	Gallons	
Workers	Gasoline	3,559,000,000	0.0019%
Off-Road/Vendor/Haul Trucks	Diesel	563,265,306	0.076%

Notes:

1 Gasoline and diesel amounts from CEC, 2019. Available: <https://www.energy.ca.gov/data-reports/energy-almanac/transportation-energy/california-retail-fuel-outlet-annual-reporting>

**Annual Electricity Summary**

Temporary Construction Trailer - Electricity	12,990 kWh/year
Construction Water Energy Estimates	151,054 kWh/year
<b>Total</b>	<b>164,044 kWh/year</b>

Harvard Westlake  
Construction Energy Analysis

Off-Road Equipment

**Equipment ≤ 100 hp**

pounds diesel fuel/hp-hr (lb/hp-hr): <sup>1</sup>	0.408 lb/hp-hr
diesel density (lb/gal): <sup>1</sup>	7.11 lb/gal
diesel gallons/hp-hr:	0.0574 gal/hp-hr
Total <100	7,868,155 hp-hr
Total diesel gallons:	451,576 gal

**Equipment > 100 hp**

pounds diesel fuel/hp-hr (lb/hp-hr): <sup>1</sup>	0.367 lb/hp-hr
diesel density (lb/gal): <sup>1</sup>	7.11 lb/gal
diesel gallons/hp-hr:	0.0516 gal/hp-hr
Total >100	5,799,629 hp-hr
Total diesel gallons:	299,408 gal

**diesel density (lb/gal):1                    750,984 gal**

[1. OFFROAD2017 Emission Factor Documentation](#)

Construction Phase	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Site Preparation-1	Excavators	1	8	158	0.38	27	12,969
Site Preparation-1	Off-Highway Trucks	1	4.4	402	0.38	27	18,148
Site Preparation-1	Skid Steer Loaders	2	8	65	0.37	27	10,390
Site Preparation-1	Tractors/Loaders/Backhoes	4	8	97	0.37	27	31,009
Demolition	Air Compressors	1	8	78	0.48	53	15,875
Demolition	Concrete/Industrial Saws	2	8	81	0.73	53	50,142
Demolition	Excavators	3	8	158	0.38	53	76,371
Demolition	Off-Highway Trucks	1	4.4	402	0.38	53	35,624
Demolition	Rough Terrain Forklifts	2	8	100	0.4	53	33,920
Demolition	Skid Steer Loaders	4	8	65	0.37	53	40,789
Demolition	Sweepers/Scrubbers	1	8	64	0.46	53	12,483
Demolition	Tractors/Loaders/Backhoes	5	8	97	0.37	53	76,087
Grading	Air Compressors	2	8	78	0.48	132	79,073
Grading	Bore/Drill Rigs	2	8	221	0.5	132	233,376
Grading	Excavators	2	8	158	0.38	132	126,804
Grading	Off-Highway Trucks	2	4.4	402	0.38	132	177,446
Grading	Pumps	2	8	84	0.74	109	108,407
Grading	Sweepers/Scrubbers	1	8	64	0.46	132	31,089
Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	132	75,800
Foundations	Air Compressors	3	8	78	0.48	283	254,292
Foundations	Bore/Drill Rigs	3	8	221	0.5	283	750,516
Foundations	Cranes	2	8	231	0.29	283	303,331
Foundations	Excavators	1	8	158	0.38	283	135,931
Foundations	Off-Highway Trucks	1	4.4	402	0.38	283	190,217
Foundations	Plate Compactors	2	8	8	0.43	283	15,576
Foundations	Pumps	3	8	84	0.74	283	422,191
Foundations	Rough Terrain Forklifts	2	8	100	0.4	283	181,120
Foundations	Skid Steer Loaders	4	8	65	0.37	283	217,797
Foundations	Tractors/Loaders/Backhoes	6	8	97	0.37	283	487,530
Utilities	Air Compressors	1	8	78	0.48	368	110,223
Utilities	Dumpers/Tenders	3	8	16	0.38	368	53,699
Utilities	Excavators	2	8	158	0.38	368	353,516
Utilities	Off-Highway Trucks	2	4.4	402	0.38	368	494,698
Utilities	Plate Compactors	2	8	8	0.43	368	20,255
Utilities	Rough Terrain Forklifts	2	8	100	0.4	368	235,520
Utilities	Rubber Tired Loaders	2	8	203	0.36	368	430,295
Utilities	Skid Steer Loaders	4	8	65	0.37	368	283,213
Utilities	Sweepers/Scrubbers	1	8	64	0.46	368	86,671
Utilities	Tractors/Loaders/Backhoes	2	8	97	0.37	368	211,320
Building Construction	Air Compressors	1	8	78	0.48	444	132,987
Building Construction	Cement and Mortar Mixers	3	8	9	0.56	444	53,706
Building Construction	Cranes	1	8	231	0.29	444	237,948

Construction Phase	Equipment	Number	Hours/Day	HP	Load	Days	Total hp-hr
Building Construction	Generator Sets	4	8	84	0.74	444	883,169
Building Construction	Rough Terrain Forklifts	2	8	100	0.4	444	284,160
Site Preparation-2	Excavators	1	8	158	0.38	26	12,488
Site Preparation-2	Graders	1	8	187	0.41	26	15,947
Site Preparation-2	Off-Highway Trucks	1	4.4	402	0.38	26	17,476
Site Preparation-2	Scrapers	2	8	367	0.48	26	73,283
Site Preparation-2	Skid Steer Loaders	4	8	65	0.37	26	20,010
Site Preparation-2	Tractors/Loaders/Backhoes	4	8	97	0.37	26	29,860
Site Preparation-2	Trenchers	1	8	78	0.5	26	8,112
Landscape	Cement and Mortar Mixers	1	8	9	0.56	394	15,886
Landscape	Cranes	2	8	231	0.29	394	422,305
Landscape	Forklifts	1	8	89	0.2	394	56,106
Landscape	Graders	1	8	187	0.41	394	241,664
Landscape	Off-Highway Trucks	1	4.4	402	0.38	394	264,825
Landscape	Rollers	2	8	80	0.38	394	191,642
Landscape	Rough Terrain Forklifts	3	8	100	0.4	394	378,240
Landscape	Rubber Tired Loaders	3	8	203	0.36	394	691,044
Landscape	Skid Steer Loaders	7	8	65	0.37	394	530,639
Landscape	Tractors/Loaders/Backhoes	5	8	97	0.37	394	565,626
Landscape	Trenchers	2	8	78	0.5	394	245,856
Pool Area	Air Compressors	1	8	78	0.48	367	109,924
Pool Area	Cranes	1	8	231	0.29	367	196,683
Pool Area	Off-Highway Trucks	1	4.4	402	0.38	367	246,677
Pool Area	Plate Compactors	1	8	8	0.43	367	10,100
Pool Area	Pumps	1	8	84	0.74	367	182,502
Pool Area	Rough Terrain Forklifts	1	8	100	0.4	367	117,440
Pool Area	Skid Steer Loaders	1	8	65	0.37	367	70,611
Pool Area	Tractors/Loaders/Backhoes	1	8	97	0.37	367	105,373
Architectural Coating	Concrete/Industrial Saws	2	8	81	0.73	310	293,285
Architectural Coating	Forklifts	2	8	89	0.2	310	88,288
Architectural Coating	Rough Terrain Forklifts	3	8	100	0.4	310	297,600
Paving	Air Compressors	1	8	78	0.48	28	8,387
Paving	Graders	1	8	187	0.41	28	17,174
Paving	Pavers	1	8	130	0.42	28	12,230
Paving	Paving Equipment	1	8	132	0.36	28	10,644
Paving	Plate Compactors	1	8	8	0.43	28	771
Paving	Pumps	1	8	84	0.74	28	13,924
Paving	Rollers	1	8	80	0.38	28	6,810
Paving	Sweepers/Scrubbers	1	8	64	0.46	28	6,595
Paving	Tractors/Loaders/Backhoes	2	8	97	0.37	28	16,079
						<b>Total &gt;100</b>	<b>5,799,629</b>
						<b>Total &lt;100</b>	<b>7,868,155</b>

**Harvard Westlake  
Construction Energy Analysis**

<b>Temporary Construction Trailer - Electricity</b>			
<b>Land Use</b>	<b>Square Feet</b>	<b>Energy Use per year (kWh)</b>	<b>Total Energy Use (kWh)</b>
General Office	1,000	12,990	32,635

Note: CalEEMod 2016.3.2 used to estimate energy use for temporary construction office

Harvard Westlake  
 Construction Energy Analysis

Construction Water Energy Estimates

Project Acres 16.75

Construction Duration 2.51

Source	Construction Water Use per Day (Mgal)	Total Construction Water Use (Mgal)	Total Electricity Demand from water Demand (kWh)	Annual Electricity Demand from water Demand (kWh)
Project	0.050	29.145	379,497	151,054
CalEEMod Water Electricity Factors	Electricity Intensity Factor To Supply (kWh/Mgal)	Electricity Intensity Factor To Treat (kWh/Mgal)	Electricity Intensity Factor To Distribute (kWh/Mgal)	Electricity Intensity Factor For Wastewater Treatment (kWh/Mgal)
Project	9727	111	1272	1911

Sources:

Electricity Intensity Factors - California Emissions Estimator Model (CalEEMod).

Estimated construction water use assumed to be generally equivalent to landscape irrigation, based on a factor of 20.94 gallons per year per square foot of

landscaped area within the Los Angeles area (Mediterranean climate), which assumes high water demand landscaping materials and an irrigation system efficiency of 85%.

Factor is therefore (20.94 GAL/SF/year) x (43,560 SF/acre) / (365 days/year) / (0.85) = 2,940 gallons/acre/day, rounded up to 3,000 gallons/acre/day.

(U.S. Department of Energy, Energy Efficiency & Renewable Energy, Federal Energy Management Program. "Guidelines for Estimating Unmetered Landscaping Water Use."

July 2010. Page 12, Table 4 - Annual Irrigation Factor – Landscaped Areas with High Water Requirements).

**Harvard Westlake  
Operational Energy Demand**

Electricity	kWh/yr	GWh/yr
Fields and Open Space	161,760	0.162
Multi Purpose Gym and Locker Rooms	998,620	0.999
Sheds/Storage/Water Storage Tanks	97,359	0.097
Swimming Pool	0	-
Tennis Courts/Pool Deck/Bleacher Seats	49,022	0.049
Security Kiosk	2,250	0.002
Parking Structure	1,173,800	1.174
Parking Lot	12,959	0.013
Pole and LED Lighting	185,994	0.186
EV Charging (see worksheet)	85,440	0.085
Solar PV (estimated by Gensler)	(281,000)	(0.281)
<b>Total Building Energy</b>	<b>2,495,770</b>	<b>2.496</b>
<b>Total</b>	<b>2,486,204</b>	<b>2.486</b>
<b>Total (including water, see below)</b>	<b>2,675,043</b>	<b>2.675</b>

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Electricity	GWh/yr
LADWP 2025-2026 Total Energy Sales	26,748
Project Annual	2.675
Existing Annual	0.806
Net Project Annual	1.869215
Percent Net Project of LADWP	0.0070%

Source: Los Angeles Department of Water and Power, 2017 Long-Term Resource Plan, Appendix A, 2017.

Water	Mgal/yr	MWh/yr
Fields and Open Space	3.30	42.97
Multi Purpose Gym and Locker Rooms	9.18	119.56
Sheds/Storage/Water Storage Tanks	0.03	0.34
Swimming Pool	0.18	2.33
Tennis Courts/Pool Deck/Bleacher Seats	0.00	-
Security Kiosk	0.00	0.03
Parking Structure	1.81	23.61
Parking Lot	0.00	-
Pole and LED Lighting	0.00	-
<b>Total</b>	<b>14.503</b>	<b>188.84</b>

Electricity Intensity Factors	kWh/Mgal
Electricity Factor - Supply	9,727
Electricity Factor - Treat	111
Electricity Factor - Distribute	1,272
Electricity Factor - Wastewater Treatment	1,911

Electricity from Water Demand	kWh/yr	GWh/yr
<b>Total</b>	<b>188,838.82</b>	<b>0.189</b>

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Water Demand based on Project Water supply Assessment

Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

Natural Gas	kBtu/yr	cubic foot (cf)
Fields and Open Space	0	-
Multi Purpose Gym and Locker Rooms	1,651,490	1,595,643
Sheds/Storage/Water Storage Tanks	21,861	21,122
Swimming Pool	56,390	54,483
Tennis Courts/Pool Deck/Bleacher Seats	0	-
Security Kiosk	1,856	1,793
Parking Structure	0	-
Parking Lot	0	-
Pole and LED Lighting	0	-
Mobile Sources	156	151
<b>Total</b>	<b>1,731,754</b>	<b>1,673,192</b>

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Conversion factor of 1,035 Btu per cubic foot based on United States Energy Information Administration data

(see: USEIA, Natural Gas, Heat Content of Natural Gas Consumed, February 28, 2018,

[https://www.eia.gov/dnav/ng/ng\\_cons\\_heat\\_a\\_EPGO\\_VGTH\\_btucf\\_a.htm](https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPGO_VGTH_btucf_a.htm). Accessed March 2020.)

1,673,041

Natural Gas	million cubic foot (cf)
SoCalGas 2025	854,830
Project Annual	1.673
Existing Annual	0.010
Net Project Annual	1.663510
Percent Net Project of SoCalGas	0.0002%

Source: California Gas and Electric Utilities, 2020 California Gas Report, p. 145,2020.



**Harvard Westlake  
Operational Energy Analysis**

**Estimated Electricity demand from Electric Vehicle Supply Equipment (EVSE)**

Land Use Type	Number of EVSE Charging Spaces	Percent of Spaces with EV Chargers	Average Charge (kWh/day) <sup>a</sup>	Days/Year	Electricity Demand (kWh/yr)	Electricity Demand (MWh/yr)
<b>Total</b>	<b>532</b>	<b>10.0%</b>	<b>4.4</b>	<b>365</b>	<b>85,440</b>	<b>85.44</b>

Notes:

- a. Estimated based on reference sources listed below.
- b. Project would install EV charging spaces for 10 percent of its parking capacity for immediate use
- c. Project would install pre-wiring for EV charging spaces for 30 percent of its parking capacity for future use (so 20% in addition to the immediate use).

Sources:

US Department of Energy. Alternative Fuels Data Center, 2016. Hybrid and Plug-In Electric Vehicle Emissions Data Sources and Assumptions.

Available at: [https://www.afdc.energy.gov/vehicles/electric\\_emissions\\_sources.html](https://www.afdc.energy.gov/vehicles/electric_emissions_sources.html).

US Department of Energy. Smith, Margaret, 2016. Level 1 Electric Vehicle Charging Stations at the Workplace.

Available at: [https://www.afdc.energy.gov/uploads/publication/WPCC\\_L1ChargingAtTheWorkplace\\_0716.pdf](https://www.afdc.energy.gov/uploads/publication/WPCC_L1ChargingAtTheWorkplace_0716.pdf).

UCLA Luskin Center for Innovation. Williams, Brett and JR deShazo, 2013. Pricing Workplace Charging: Financial Viability and Fueling Costs.

Available at: <http://luskin.ucla.edu/sites/default/files/Luskin-WPC-TRB-13-11-15d.pdf>.

**Harvard Westlake  
Pole Lighting and LED Screens**

**Pole Lighting  
Based on Illuminance Calculations From Lighting Analysis**

**Circuit Summary**

Circuit	Description	Load (kW)	Fixture Qty
A	Track and Field	31.36	29
B	Tennis 1	6.96	12
C	Tennis 2	6.96	12
D	Tennis 3	6.96	12
E	Tennis 4	6.96	12
F	Athletic Fields	66.75	46
G	Pool	10.41	19
H	Track	2.67	26
I	Ball Tracking Fixtures	3.45	6
		142.480	

Assumptions		
Weekdays+Sundays/Year		313
Saturdays (when facilities will be used)		10
Lighting # hours per day		4
hours operating per year		1292
Energy usage per year		184084.2 kwh/year

**LED Screens**

LED Screen	Dimensions (ft)		Diagonal	Power Usage Watts
Field A	25	18	30.8	739.2
Field B	25	18	30.8	739.2
			Total	1478.4

Assumptions		
Weekdays+Sundays/Year		313
Saturdays (when facilities will be used)		10
Screens # hours per day		4
hours operating per year		1292
Energy usage per year		1910093 wh/year 1910 kwh/year

LED scaled from 50 inches diameter screen using 100 W  
[http://energyusecalculator.com/electricity\\_lcdleddisplay.htm](http://energyusecalculator.com/electricity_lcdleddisplay.htm)  
 Assumes LED no used on sundays since no events

Solar Assumptions

System Info 426.0 Panels

Generate	281,000 kwh/year
	281.0 mwh/year
Carbon Intensity F	626.48 lbs CO2/MWh
CH4IntensityFact	0.029 lbs CO2/MWh
N2OIntensityFact	0.006 lbs N2O/MWh
CO2e lbs/year	176747
lbs/metric ton	2204.623
CO2e MT/year	80.17

Source: Gensler

**Harvard Westlake  
Operational Energy Analysis  
Fuel Usage from VMT**

Annual VMT (Traffic Study)<sup>4</sup>: 3,958,345 miles/year

Fuel Type: <sup>1</sup>	GAS	DSL	ELEC	NG
Percent:	93.5%	4.2%	2.2%	0.1%
Miles per Gallon Fuel:	27.8	11.3	-	3.42
Annual VMT by Fuel Type (miles):	3,699,421	166,771	88,445	3,708
Annual Fuel Usage (gallons):	132,955	14,756	-	156
Annual Fuel Savings from Electric Vehicles: <sup>2</sup>	-	-	3,179	

	Los Angeles County Fuel Consumption <sup>3</sup>	
	Gasoline	Diesel
Los Angeles County:	3,559,000,000	563,265,306
Project Annual:	132,955	14,756
Existing Annual:	86,535	8,319
Net Annual:	46,419	6,437
Percent Net Project of Los Angeles County:	0.0013%	0.0011%

Notes:

1. California Air Resources Board, EMFAC2017 (South Coast Air Basin; Annual; 2024', Aggregate Fleet).
2. Assumes electric vehicles would replace traditional gasoline-fueled vehicles.
3. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2018. Available at: [https://ww2.energy.ca.gov/almanac/transportation\\_data/gasoline/piira\\_retail\\_survey.html](https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html). Accessed March 2020. Diesel is adjusted to account for retail (48%) and non-retail (52%) diesel sales.
4. Fehr & Peers, Transportation Assessment for the Harvard-Westlake River Park Project, December 2020.

**Harvard Westlake  
Existing Energy Demand**

Electricity	kWh/yr	GWh/yr
Tennis House	12,177	0.012
Tennis Courts	112,640	0.113
Golf-Related Land Uses	492,678	0.493
Parking lot	33,792	0.034
Parcel	0	-
<b>Total Building Energy</b>	<b>651,287</b>	<b>0.651</b>
<b>Total</b>	<b>651,287</b>	<b>0.651</b>
<b>Total (including water, see below)</b>	<b>805,828</b>	<b>0.806</b>

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Water	Mgal/yr	
Tennis House	0.05	0.62
Tennis Courts	0.00	-
Golf-Related Land Uses	11.33	147.56
Parking lot	0.49	6.36
Parcel	0.00	-
<b>Total</b>	<b>11.869</b>	<b>154.54</b>

Electricity Intensity Factors	kWh/Mgal	
Electricity Factor - Supply	9,727	
Electricity Factor - Treat	111	
Electricity Factor - Distribute	1,272	
Electricity Factor - Wastewater Treatment	1,911	

Electricity from Water Demand	kWh/yr	GWh/yr
<b>Total</b>	<b>154,541.20</b>	<b>0.155</b>

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Water Demand based on Project Water supply Assessment

Sewage Facilities Charge, Sewage Generation Factor for Residential and Commercial Categories, 2012.

Natural Gas	kBtu/yr	cubic foot (cf)
Tennis House	9,940	9,603
Tennis Courts	0	-
Golf-Related Land Uses	0	-
Parking lot	0	-
Parcel	0	-
Mobile Sources	81	78
<b>Total</b>	<b>10,021</b>	<b>9,682</b>

Source: California Air Resources Board, CalEEMod, Version 2016.3.2.

Conversion factor of 1,035 Btu per cubic foot based on United States Energy Information Administration data

(see: USEIA, Natural Gas, Heat Content of Natural Gas Consumed, February 28, 2018,

[https://www.eia.gov/dnav/ng/ng\\_cons\\_heat\\_a\\_EPGO\\_VGTH\\_btucf\\_a.htm](https://www.eia.gov/dnav/ng/ng_cons_heat_a_EPGO_VGTH_btucf_a.htm). Accessed March 2020.)

Electricity	GWh/yr
LADWP 2025-2026 Total Energy Sales	23,537
Existing Annual	0.806

Source: Los Angeles Department of Water and Power, 2017 Long-Term Resource Plan, Appendix A, 2017.

Natural Gas	million cubic foot (cf)
SoCalGas 2025	854,830
Existing Annual	0.010

Source: California Gas and Electric Utilities, 2020 California Gas Report, p. 145, 2020.

**Harvard Westlake  
Existing Energy Analysis  
Fuel Usage from VMT**

6,030 Daily VMT - Project

Annual VMT (Traffic Study)<sup>4</sup>:

2,200,950 miles/year

Fuel Type: <sup>1</sup>	GAS	DSL	ELEC	NG
Percent:	95.3%	3.6%	1.0%	0.1%
Miles per Gallon Fuel:	24.2	9.6	-	3.45
Annual VMT by Fuel Type (miles):	2,098,268	79,626	21,114	1,942
Annual Fuel Usage (gallons):	86,535	8,319	-	81
Emergency Generator				
Annual Fuel Savings from Electric Vehicles: <sup>2</sup>	-	-	871	

	Los Angeles County Fuel Consumption <sup>3</sup>	
	Gasoline	Diesel
Los Angeles County:	3,559,000,000	563,265,306
Existing Annual:	86,535	8,319
Percent Net Project of Los Angeles County:	0.0024%	0.0015%

Notes:

1. California Air Resources Board, EMFAC2017 (South Coast Air Basin; Annual; 2024', Aggregate Fleet).
2. Assumes electric vehicles would replace traditional gasoline-fueled vehicles.
3. California Energy Commission, California Retail Fuel Outlet Annual Reporting (CEC-A15) Results, 2018. Available at: [https://ww2.energy.ca.gov/almanac/transportation\\_data/gasoline/piira\\_retail\\_survey.html](https://ww2.energy.ca.gov/almanac/transportation_data/gasoline/piira_retail_survey.html). Accessed March 2020. Diesel is adjusted to account for retail (48%) and non-retail (52%) diesel sales.
4. Fehr & Peers, Transportation Assessment for the Harvard-Westlake River Park Project, December 2020.