

**Appendix F:  
Energy Supporting Information**

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## **CityWalk Master Plan EIR - Energy Calculations**

Last Revision: 5/6/20

<b>Summary of Energy Use During Construction</b>	<b>(Total Annual Consumption)</b>
Construction vehicle fuel	<b>10,587,099 gallons (gasoline, diesel)</b>
Construction equipment	<b>880,609 gallons (diesel)</b>
Construction office electricity	<b>346,826 kilowatt hours</b>

  

<b>Summary of Energy Use During Operations</b>	<b>(Annually)</b>
Operation Vehicle Fuel	<b>597,961 gallons (gasoline, diesel)</b>
Building Natural Gas	<b>58,447,345 kilo-British Thermal Units</b>
Building Electricity	<b>51,411,875 kilowatt hours</b>

**Construction Vehicle Fuel Calculations**

California Air Resource Board. 2020. EMFAC2014 Web Database. February. Website: <https://www.arb.ca.gov/emfac/2014/>. Accessed February 26, 2021

EMFAC2014 (v1.0.7) Emissions Inventory

Region Type: County

Region: Contra Costa

Calendar Year: 2021

Season: Annual

Vehicle Classification: EMFAC2007 Categories

Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled  
FE = Fuel Economy

Region	CalYr	VehClass	MdlYr	Speed	Fuel	Population VMT (mi/day)	Fuel_Consumption (1000 gallons/day)	Calculations		
								FE (mi/gallon)	VMT*FE	
Contra Costa		2021 HHDT	Aggregated	Aggregated	GAS	35.49411	4801.890157	1.0099619	4.754526082	22830.712
Contra Costa		2021 HHDT	Aggregated	Aggregated	DSL	4335.88	595909.4323	101.65633	5.862000384	3493221.321
Contra Costa		2021 LDA	Aggregated	Aggregated	GAS	380337.7	14006557.71	465.56727	30.08492772	421386276.4
Contra Costa		2021 LDA	Aggregated	Aggregated	DSL	4254.054	160879.0454	4.2011979	38.29361238	6160639.805
Contra Costa		2021 LDT1	Aggregated	Aggregated	GAS	28059.68	986241.0891	38.941794	25.32603108	24977572.48
Contra Costa		2021 LDT1	Aggregated	Aggregated	DSL	28.0969	670.3359452	0.0227562	29.45732452	19746.30347
Contra Costa		2021 LDT2	Aggregated	Aggregated	GAS	118240.1	4687318.748	207.92699	22.54309863	105666688.9
Contra Costa		2021 LDT2	Aggregated	Aggregated	DSL	202.7826	8986.088558	0.3002653	29.92715926	268928.1034
Contra Costa		2021 LHDT1	Aggregated	Aggregated	GAS	7047.187	209041.8735	21.647861	9.656467815	2018606.124
Contra Costa		2021 LHDT1	Aggregated	Aggregated	DSL	6553.456	224792.1488	12.83678	17.51156781	3936462.957
Contra Costa		2021 LHDT2	Aggregated	Aggregated	GAS	1029.631	38838.39532	4.3790344	8.869168855	344464.2862
Contra Costa		2021 LHDT2	Aggregated	Aggregated	DSL	2257.239	89485.07633	5.6331933	15.88531962	1421499.038
Contra Costa		2021 MDV	Aggregated	Aggregated	GAS	86570.35	3056760.812	184.62884	16.55624804	50608490.19
Contra Costa		2021 MDV	Aggregated	Aggregated	DSL	1317.251	58790.97628	2.5786577	22.79906182	1340379.103
Contra Costa		2021 MHDT	Aggregated	Aggregated	GAS	712.6758	38848.25506	5.9884091	6.487241326	252018.0057
Contra Costa		2021 MHDT	Aggregated	Aggregated	DSL	4714.438	229129.245	27.6091	8.29904793	1901554.587

**Worker Trips**

Sum of VMT*FE (Column B)	610428721.2
Total VMT	22966204.81
Weighted Average FE	26.57943384

**Vendor**

Sum of VMT*FE (Column B)	13390657.03
Total VMT	1430846.317
Weighted Average FE	9.358557153

**Haul**

Sum of VMT*FE (Column B)	3516052.033
Total VMT	600711.3225
Weighted Average FE	5.853147596

**Site Work for the Entire Project Site - Unmitigated Construction - Contra Costa County, Annual**

Date: 2/25/2020 5:10 PM

Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Site Preparation	Site Preparation	1/1/2021	3/25/2021	5	60
	Grading	Grading	1/1/2021	3/25/2021	5	60

**Trips and VMT**

Phase Name	Trips per Day		Total Trips		Vendor					Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Trip Length	Hauling Trip Length	Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips		
	Site Preparation	18	0	0	10.8	7.3	20	60	1,080	0	0	0	11,664	0	0	438.84	0.00	0.00
Grading	25	0	7,000	10.8	7.3	20	60	1,500	0	7,000	16,200	0	140,000	609.49	0.00	1,195.94		

Total Construction Site Work VMT  
167,864

Total Site Work Fuel Consumption (gallons)  
2,244

**CityWalk Master Plan Unmitigated Construction—Phase 1 - Contra Costa County, Annual**

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Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Grading	Grading	3/26/2021	5/6/2021	5	30
	Building Construction	Building Construction	5/7/2021	6/30/2022	5	300
	Paving	Paving	7/1/2022	7/28/2022	5	20
	Architectural Coating	Architectural Coating	7/29/2022	8/25/2022	5	20

**Trips and VMT**

Phase Name	Trips per Day		Total Trips		Vendor					Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Trip Length	Hauling Trip Length	Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips		
	Grading	20	0	0	10.8	7.3	20	30	600	0	0	0	6,480	0	0	243.80	0.00	0.00
Building Construction	476	136	0	10.8	7.3	20	300	142,800	40,800	0	1,542,240	297,840	0	58,023.81	31,825.42	0.00		
Paving	15	0	0	10.8	7.3	20	20	300	0	0	3,240	0	0	121.90	0.00	0.00		
Architectural Coating	95	0	0	10.8	7.3	20	20	1,900	0	0	20,520	0	0	772.03	0.00	0.00		

Total Construction Phase 1 VMT  
1,870,320

Total Phase 1 Fuel Consumption (gallons)  
90,987

CityWalk Master Plan Bishop Ranch 1A Unmitigated Construction—Phases 2-3 - Contra Costa County, Annual  
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Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Week	Num Days
	Grading	Grading	1/1/2022	1/28/2022	5	20
	Building Construction	Building Construction	1/29/2022	11/6/2025	5	984
	Paving	Paving	11/7/2025	12/4/2025	5	20
	Architectural Coating	Architectural Coating	12/5/2025	1/1/2026	5	20

Trips and VMT

Phase Name	Trips per Day			Total Trips			Vendor Trip Length	Worker Trip Length	Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length			Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips
Grading	15	0	0	10.8	7.3	20	20	300	0	0	0	3,240	0	0	121.90	0.00	0.00
Building Construction	490	78	0	10.8	7.3	20	984	482,160	76,752	0	0	5,207,328	560,290	0	195,915.69	59,869.23	0.00
Paving	15	0	0	10.8	7.3	20	20	300	0	0	0	3,240	0	0	121.90	0.00	0.00
Architectural Coating	98	0	0	10.8	7.3	20	20	1,960	0	0	0	21,168	0	0	796.41	0.00	0.00

Total Construction Phase 2-3 VMT  
5,795,266

Total Phase 2-3 Fuel Consumption (gallons)  
256,825

CityWalk Master Plan Unmitigated Construction Phases 4-6 (Bishop Ranch 3A) - Contra Costa County, Annual  
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Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Week	Num Days
	Grading	Grading	1/1/2026	2/11/2026	5	30
	Building Construction	Building Construction	2/12/2026	11/6/2031	5	1496
	Paving	Paving	11/7/2031	12/4/2031	5	20
	Architectural Coating	Architectural Coating	12/5/2031	1/1/2032	5	20

Trips and VMT

Phase Name	Trips per Day			Total Trips			Vendor Trip Length	Worker Trip Length	Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length			Num Days	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips
Grading	20	0	0	10.8	7.3	20	30	600	0	0	0	6,480	0	0	243.80	0.00	0.00
Building Construction	654	120	0	10.8	7.3	20	1496	978,384	179,520	0	0	10,566,547	1,310,496	0	397,545.98	140,031.84	0.00
Paving	15	0	0	10.8	7.3	20	20	300	0	0	0	3,240	0	0	121.90	0.00	0.00
Architectural Coating	131	0	0	10.8	7.3	20	20	2,620	0	0	0	28,296	0	0	1,064.58	0.00	0.00

Total Construction Phase 4-6 VMT  
11,915,059

Total Phase 4-6 Fuel Consumption (gallons)  
539,008

CityWalk Master Plan Bishop Ranch 2600 Unmitigated Construction—Phases 7-14 - Contra Costa County, Annual  
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Construction Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days	
					Week	Num Days
	Grading	Grading	1/1/2032	8/4/2032	5	155
	Building Construction	Building Construction	8/5/2032	2/27/2047	5	3800
	Paving	Paving	2/28/2047	7/31/2047	5	110
	Architectural Coating	Architectural Coating	8/1/2047	1/1/2048	5	110

Trips and VMT	Phase Name	Trips per Day			Total Trips			Num Days	Worker Trip Number	Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
		Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length			Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips	
	Grading	20	0	0	10.8	7.3	20	155	3,100	0	0	0	33,480	0	0	1,259.62	0.00	0.00
	Building Construction	4102	1122	0	10.8	7.3	20	3800	15,587,600	4,263,600	0	0	168,346,080	31,124,280	0	6,333,696.99	3,325,756.26	0.00
	Paving	15	0	0	10.8	7.3	20	110	1,650	0	0	0	17,820	0	0	670.44	0.00	0.00
	Architectural Coating	820	0	0	10.8	7.3	20	110	90,200	0	0	0	974,160	0	0	36,650.89	0.00	0.00

Total Construction Phase 7-14 VMT  
 200,495,820

Total Phase 7-14 Fuel Consumption (gallons)  
 9,698,034

Total Construction VMT (All Phases)  
 220,244,329

Total Construction Fuel Consumption All Phases (gallons)  
 10,587,099

**Construction Equipment Fuel Calculation**

Appendix C (AQ/GHG): CalEEMod output files

**Site Work for the Entire Project Site - Unmitigated Construction - Contra Costa County, Annual**

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**Construction**

Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days		Number of			
					Week	Num Days	Days	HP Hours	Diesel Fuel Usage	
	Site Preparation	Site Preparation	1/1/2021	3/25/2021	5	60				
	Grading	Grading	1/1/2021	3/25/2021	5	60				
	Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Days	HP Hours	Diesel Fuel Usage	
	Site Preparation	Rubber Tired Dozers	3	8	247	0.40	60	142,272.00	7,113.60	
	Site Preparation	Tractors/Loaders/Backhoes	4	8	97	0.37	60	68,908.80	3,445.44	
	Grading	Excavators	2	8	158	0.38	60	57,638.40	2,881.92	
	Grading	Graders	1	8	187	0.41	60	36,801.60	1,840.08	
	Grading	Off-Highway Trucks	2	8	402	0.38	60	146,649.60	7,332.48	
	Grading	Rubber Tired Dozers	1	8	247	0.40	60	47,424.00	2,371.20	
	Grading	Scrapers	2	8	367	0.48	60	169,113.60	8,455.68	
	Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	60	34,454.40	1,722.72	

**CityWalk Master Plan Unmitigated Construction—Phase 1 - Contra Costa County, Annual**

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**Construction**

Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days		Number of			
					Week	Num Days	Days	HP Hours	Diesel Fuel Usage	
	Grading	Grading	3/26/2021	5/6/2021	5	30				
	Building Construction	Building Construction	5/7/2021	6/30/2022	5	300				
	Paving	Paving	7/1/2022	7/28/2022	5	20				
	Architectural Coating	Architectural Coating	7/29/2022	8/25/2022	5	20				
	Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Days	HP Hours	Diesel Fuel Usage	
	Grading	Excavators	2	8	158	0.38	30	28,819.20	1,440.96	
	Grading	Graders	1	8	187	0.41	30	18,400.80	920.04	
	Grading	Rubber Tired Dozers	1	8	247	0.40	30	23,712.00	1,185.60	
	Grading	Scrapers	2	8	367	0.48	30	84,556.80	4,227.84	
	Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	30	17,227.20	861.36	
	Building Construction	Cranes	1	7	231	0.29	300	140,679.00	7,033.95	
	Building Construction	Forklifts	3	8	89	0.2	300	128,160.00	6,408.00	
	Building Construction	Generator Sets	1	8	84	0.74	300	149,184.00	7,459.20	
	Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	300	226,107.00	11,305.35	
	Building Construction	Welders	1	8	46	0.45	300	49,680.00	2,484.00	
	Paving	Pavers	2	8	130	0.42	20	17,472.00	873.60	
	Paving	Paving Equipment	2	8	132	0.36	20	15,206.40	760.32	
	Paving	Rollers	2	8	80	0.38	20	9,728.00	486.40	
	Architectural Coating	Air Compressors	1	6	78	0.48	20	4,492.80	224.64	



CityWalk Master Plan Bishop Ranch 1A Unmitigated Construction—Phases 2-3 - Contra Costa County, Annual

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**Construction**

Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days		Number of							
					Week	Num Days	Amount	Usage Hours	Horse Power	Load Factor	Days	HP Hours	Diesel Fuel Usage	
	Grading	Grading	1/1/2022	1/28/2022	5	20								
	Building Construction	Building Construction	1/29/2022	11/6/2025	5	984								
	Paving	Paving	11/7/2025	12/4/2025	5	20								
	Architectural Coating	Architectural Coating	12/5/2025	1/1/2026	5	20								
	<b>Phase Name</b>	<b>Offroad Equipment Type</b>	<b>Amount</b>	<b>Usage Hours</b>	<b>Horse Power</b>	<b>Load Factor</b>	<b>Days</b>	<b>HP Hours</b>	<b>Diesel Fuel Usage</b>					
	Grading	Excavators	1	8	158	0.38	20	9,606.40	480.32					
	Grading	Graders	1	8	187	0.41	20	12,267.20	613.36					
	Grading	Rubber Tired Dozers	1	8	247	0.40	20	15,808.00	790.40					
	Grading	Tractors/Loaders/Backhoes	3	8	97	0.37	20	17,227.20	861.36					
	Building Construction	Cranes	1	7	231	0.29	984	461,427.12	23,071.36					
	Building Construction	Forklifts	3	8	89	0.2	984	420,364.80	21,018.24					
	Building Construction	Generator Sets	1	8	84	0.74	984	489,323.52	24,466.18					
	Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	984	741,630.96	37,081.55					
	Building Construction	Welders	1	8	46	0.45	984	162,950.40	8,147.52					
	Paving	Pavers	2	8	130	0.42	20	17,472.00	873.60					
	Paving	Paving Equipment	2	8	132	0.36	20	15,206.40	760.32					
	Paving	Rollers	2	8	80	0.38	20	9,728.00	486.40					
	Architectural Coating	Air Compressors	1	6	78	0.48	20	4,492.80	224.64					

CityWalk Master Plan Unmitigated Construction Phases 4-6 (Bishop Ranch 3A) - Contra Costa County, Annual

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**Construction**

Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days		Number of							
					Week	Num Days	Amount	Usage Hours	Horse Power	Load Factor	Days	HP Hours	Diesel Fuel Usage	
	Grading	Grading	1/1/2026	2/11/2026	5	30								
	Building Construction	Building Construction	2/12/2026	11/6/2031	5	1496								
	Paving	Paving	11/7/2031	12/4/2031	5	20								
	Architectural Coating	Architectural Coating	12/5/2031	1/1/2032	5	20								
	<b>Phase Name</b>	<b>Offroad Equipment Type</b>	<b>Amount</b>	<b>Usage Hours</b>	<b>Horse Power</b>	<b>Load Factor</b>	<b>Days</b>	<b>HP Hours</b>	<b>Diesel Fuel Usage</b>					
	Grading	Excavators	2	8	158	0.38	30	28,819.20	1,440.96					
	Grading	Graders	1	8	187	0.41	30	18,400.80	920.04					
	Grading	Rubber Tired Dozers	1	8	247	0.40	30	23,712.00	1,185.60					
	Grading	Scrapers	2	8	367	0.48	30	84,556.80	4,227.84					
	Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	30	17,227.20	861.36					
	Building Construction	Cranes	1	7	231	0.29	1496	701,519.28	35,075.96					
	Building Construction	Forklifts	3	8	89	0.2	1496	639,091.20	31,954.56					
	Building Construction	Generator Sets	1	8	84	0.74	1496	743,930.88	37,196.54					
	Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	1496	1,127,520.24	56,376.01					
	Building Construction	Welders	1	8	46	0.45	1496	247,737.60	12,386.88					
	Paving	Pavers	2	8	130	0.42	20	17,472.00	873.60					
	Paving	Paving Equipment	2	8	132	0.36	20	15,206.40	760.32					
	Paving	Rollers	2	8	80	0.38	20	9,728.00	486.40					
	Architectural Coating	Air Compressors	1	6	78	0.48	20	4,492.80	224.64					

CityWalk Master Plan Bishop Ranch 2600 Unmitigated Construction—Phases 7-14 - Contra Costa County, Annual

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**Construction**

Schedule	Phase Name	Phase Type	Start Date	End Date	Num Days		Number of		
					Week	Num Days	Days	HP Hours	Diesel Fuel Usage
	Grading	Grading	1/1/2032	8/4/2032	5	155			
	Building Construction	Building Construction	8/5/2032	2/27/2047	5	3800			
	Paving	Paving	2/28/2047	7/31/2047	5	110			
	Architectural Coating	Architectural Coating	8/1/2047	1/1/2048	5	110			
	Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Days	HP Hours	Diesel Fuel Usage
	Grading	Excavators	2	8	158	0.38	155	148,899.20	7,444.96
	Grading	Graders	1	8	187	0.41	155	95,070.80	4,753.54
	Grading	Rubber Tired Dozers	1	8	247	0.40	155	122,512.00	6,125.60
	Grading	Scrapers	2	8	367	0.48	155	436,876.80	21,843.84
	Grading	Tractors/Loaders/Backhoes	2	8	97	0.37	155	89,007.20	4,450.36
	Building Construction	Cranes	1	7	231	0.29	3800	1,781,934.00	89,096.70
	Building Construction	Forklifts	3	8	89	0.2	3800	1,623,360.00	81,168.00
	Building Construction	Generator Sets	1	8	84	0.74	3800	1,889,664.00	94,483.20
	Building Construction	Tractors/Loaders/Backhoes	3	7	97	0.37	3800	2,864,022.00	143,201.10
	Building Construction	Welders	1	8	46	0.45	3800	629,280.00	31,464.00
	Paving	Pavers	2	8	130	0.42	110	96,096.00	4,804.80
	Paving	Paving Equipment	2	8	132	0.36	110	83,635.20	4,181.76
	Paving	Rollers	2	8	80	0.38	110	53,504.00	2,675.20
	Architectural Coating	Air Compressors	1	6	78	0.48	110	24,710.40	1,235.52

**Total Construction Equipment Fuel Consumption**

**880,609** gallons

Notes:

Equipment assumptions are provided in the CalEEMod output files.

Fuel usage estimate of 0.05 gallons of diesel fuel per horsepower-hour is from the SCAQMD CEQA Air Quality Handbook, Table A9-3E.

South Coast Air Quality Management District. 1993. Air Quality Handbook, Table A9-3E.

Website: <http://www.aqmd.gov/home/rules-compliance/ceqa/air-quality-analysis-handbook>. Accessed April 18, 2019.

**Construction Office Electricity Calculation**

Appendix F (Energy): CalEEMod Construction Office Electricity

kWh/yr = kilowatt hours per year

Land Use	Electricity Use kWh/yr	Total CO2 MT/yr	CH4 MT/yr	N2O MT/yr	CO2e MT/yr
General Office Building	12837.6	1.9274	1.7000e-004	3.0000e-005	1.9421
<b>Total</b>		<b>1.9274</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>1.9421</b>

Construction 5 days per week

**Site Work for the Entire Project Site - Unmitigated Construction - Contra Costa County, Annual**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	1/1/2021	3/25/2021	5	60	60 days maximum
2	Grading	Grading	1/1/2021	3/25/2021	5	60	60 days maximum

**CityWalk Master Plan Unmitigated Construction—Phase 1 - Contra Costa County, Annual**

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Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	3/26/2021	5/6/2021	5	30	
2	Building Construction	Building Construction	5/7/2021	6/30/2022	5	300	
3	Paving	Paving	7/1/2022	7/28/2022	5	20	
4	Architectural Coating	Architectural Coating	7/29/2022	8/25/2022	5	20	

**CityWalk Master Plan Bishop Ranch 1A Unmitigated Construction—Phases 2 - 3 - Contra Costa County, Annual**

Date: 2/25/2020 9:12 PM

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2022	1/28/2022	5	20	
2	Building Construction	Building Construction	1/29/2022	11/6/2025	5	984	
3	Paving	Paving	11/7/2025	12/4/2025	5	20	
4	Architectural Coating	Architectural Coating	12/5/2025	1/1/2026	5	20	

**CityWalk Master Plan Unmitigated Construction Phases 4-6 (Bishop Ranch 3A) - Contra Costa County, Annual**

Date: 2/25/2020 9:33 PM

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/1/2026	2/11/2026	5	30	
2	Building Construction	Building Construction	2/12/2026	11/6/2031	5	1496	
3	Paving	Paving	11/7/2031	12/4/2031	5	20	
4	Architectural Coating	Architectural Coating	12/5/2031	1/1/2032	5	20	

CityWalk Master Plan Bishop Ranch 2600 Unmitigated Construction—Phases 7-14 - Contra Costa County, Annual

Date: 2/25/2020 10:19 PM

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days	Num Days	Phase Description
1	Grading	Grading	1/1/2032	8/4/2032	5	155	
2	Building Construction	Building Construction	8/5/2032	2/27/2047	5	3800	
3	Paving	Paving	2/28/2047	7/31/2047	5	110	
4	Architectural Coating	Architectural Coating	8/1/2047	1/1/2048	5	110	

Start of Construction 1/1/2021  
 End of Construction 1/1/2048  
 Number of Workdays 7,044 (non-weekends)  
 Days 9,861  
 Days in a year 365  
 Years of Construction 27

Time (years) Electricity Use  
 1 12,838 kWh/yr  
 27 **346,826 kWh/yr**

**Operation Fuel Calculation**

Appendix C (AQ/GHG): CalEEMod output files

VMT = Vehicle Miles Traveled  
 FE = Fuel Economy

CityWalk Master Plan Bishop Ranch 1A, Bishop Ranch 3A, and Bishop 2600 (Unmitigated Annual Operations)

Date: 5/6/2020

Land Use	Average Daily Trip Rate			Unmitigated	Mitigated
	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
Apartments Low Rise	24,480.00	22,095.00	18,405.00	53,747,861	17,871,164
Arena	0.00	0.00	0.00		
City Park	0.00	0.00	0.00		
Enclosed Parking with Elevator	0.00	0.00	0.00		
Health Club	0.00	0.00	0.00		
Hotel	1,412.94	1,384.11	1,005.55	2,565,954	853,180
Regional Shopping Center	6,266.50	7,655.92	3,502.60	10,642,816	3,538,736
<b>Total</b>	<b>32,159.34</b>	<b>31,135.03</b>	<b>22,913.15</b>	<b>66,956,631</b>	<b>22,263,080</b>

Annual VMT: 22,263,080

California Air Resource Board. 2020. EMFAC2014 Web Database. February. Website: <https://www.arb.ca.gov/emfac/2014/>. Accessed February 26, 2020  
 EMFAC2014 (v1.0.7) Emissions Inventory  
 Region Type: County  
 Region: Contra Costa  
 Calendar Year: 2048  
 Season: Annual  
 Vehicle Classification: EMFAC2007 Categories  
 Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

Given										Calculations	
Region	CalYr	VehClass	MdYr	Speed	Fuel	Population	VMT (mi/day)	Fuel_Consumption (1000 gallons/day)	FE (mi/gallon)	VMT*FE	
Contra Costa	2048	HHDT	Aggregated	Aggregated	GAS	66.37652849	7744.07518	1.540105602	5.028275	38939.34306	
Contra Costa	2048	HHDT	Aggregated	Aggregated	DSL	6217.918389	901422.8923	137.7752333	6.542706	5897745.273	
Contra Costa	2048	LDA	Aggregated	Aggregated	GAS	503909.7129	16347491.83	379.7257025	43.05079	703772453.3	
Contra Costa	2048	LDA	Aggregated	Aggregated	DSL	7006.760741	227974.1942	4.233522023	53.84977	12276358.3	
Contra Costa	2048	LDT1	Aggregated	Aggregated	GAS	31666.75347	1093046.779	26.86999449	40.67908	44464142.41	
Contra Costa	2048	LDT1	Aggregated	Aggregated	DSL	17.49083575	606.1910405	0.011884328	51.0076	30920.34924	
Contra Costa	2048	LDT2	Aggregated	Aggregated	GAS	166937.35	5896024.909	168.7945394	34.93019	205949255.5	
Contra Costa	2048	LDT2	Aggregated	Aggregated	DSL	366.9951259	12983.92868	0.296899251	43.73177	567810.135	
Contra Costa	2048	LHDT1	Aggregated	Aggregated	GAS	3421.795012	111446.2609	10.62400412	10.49004	1169076.078	
Contra Costa	2048	LHDT1	Aggregated	Aggregated	DSL	6740.551249	218724.1734	11.24046924	19.45863	4256073.568	
Contra Costa	2048	LHDT2	Aggregated	Aggregated	GAS	1274.740197	44752.68121	4.76612394	9.389743	420216.1968	
Contra Costa	2048	LHDT2	Aggregated	Aggregated	DSL	3149.165812	110538.6045	6.366526574	17.36247	1919222.821	
Contra Costa	2048	MCY	Aggregated	Aggregated	GAS	23255.99397	161088.2353	4.355170332	36.98782	5958301.874	
Contra Costa	2048	MDV	Aggregated	Aggregated	GAS	99356.65735	3285187.343	122.8294078	26.74593	87865406.74	
Contra Costa	2048	MDV	Aggregated	Aggregated	DSL	2785.924435	93826.51761	2.800789185	33.50003	3143191.017	
Contra Costa	2048	MH	Aggregated	Aggregated	GAS	1812.135903	15176.48643	2.159188701	7.028791	106672.3535	
Contra Costa	2048	MH	Aggregated	Aggregated	DSL	512.454427	4272.834808	0.424512691	10.06527	43007.23551	
Contra Costa	2048	MHDT	Aggregated	Aggregated	GAS	1181.714216	57799.45324	8.594605993	6.725085	388706.2185	
Contra Costa	2048	MHDT	Aggregated	Aggregated	DSL	6639.961898	297286.7733	34.15224238	8.704751	2587807.401	
Contra Costa	2048	OBUS	Aggregated	Aggregated	GAS	629.4850063	31595.95484	4.630310501	6.823723	215602.034	
Contra Costa	2048	OBUS	Aggregated	Aggregated	DSL	345.8143231	23143.80895	3.037690535	7.618883	176329.9738	
Contra Costa	2048	SBUS	Aggregated	Aggregated	GAS	210.758769	9334.567446	0.763901669	12.21959	114064.6145	
Contra Costa	2048	SBUS	Aggregated	Aggregated	DSL	1964.559062	66868.54732	8.852518218	7.553619	505099.5107	
Contra Costa	2048	UBUS	Aggregated	Aggregated	GAS	176.296169	23173.82958	4.420792693	5.242008	121477.3944	
Contra Costa	2048	UBUS	Aggregated	Aggregated	DSL	170.7295315	22442.10461	4.54450509	4.938295	110825.7223	
<b>Sum of VMT*FE (Column I)</b>										1,082,098,705.40	
<b>Sum of VMT (Column H)</b>										29,063,952.98	
<b>Weighted Average FE</b>										<b>37.2316 miles/gallon</b>	
Operational VMT (CalEEMod output files)										22,263,080	
<b>Fuel consumption for 2048 operational year</b>										<b>597,961 gallons (gasoline, diesel)</b>	

## Operation Natural Gas Use

Appendix C (AQ/GHG): CalEEMod output files

kBTU/yr = kilo-British Thermal Units/year

CF = cubic feet

CityWalk Master Plan Bishop Ranch 1A, Bishop Ranch 3A, and Bishop 2600 (Unmitigated Annual Operations)

Apartments Low Rise	4.59E+07 kBTU/yr
Arena	8.90E+05 kBTU/yr
City Park	0.00E+00 kBTU/yr
Enclosed Parking	0.00E+00 kBTU/yr
Health Club	3.96E+05 kBTU/yr
Shopping Center	1.09E+07 kBTU/yr
Hotel	3.93E+05 kBTU/yr

**Total: 58,447,345 kBTU/yr**

**Combined Total: 58,447,345 kBTU/yr**

**Equivalency: 57,301,358 CF/yr natural gas**

Conversion from kBTU/yr to CF/yr: Abraxas. 2020. Energy Conversion Calculator. Website: <https://www.abraxasenergy.com/energy-resources/toolbox/conversion-calculators/energy/>. Accessed February 27, 2020.



## Operation Electricity Use

Appendix C (AQ/GHG): CalEEMod output files

kWh/yr = kilowatt hours per year

CityWalk Master Plan Bishop Ranch 1A, Bishop Ranch 3A, and Bishop 2600  
(Unmitigated Annual Operations)

### Electricity Use by Land Use

Apartments Low Rise	1.96E+07 kWh/yr
Arena	2.79E+05 kWh/yr
City Park	0.00E+00 kWh/yr
Enclosed Parking with Elevator	2.78E+07 kWh/yr
Health Club	1.24E+05 kWh/yr
Hotel	1.87E+06 kWh/yr
Regional Shopping Center	1.77E+06 kWh/yr

**Total: 51,411,875 kWh/yr**

Typical Construction Trailer - Contra Costa County, Annual

**Typical Construction Trailer  
Contra Costa County, Annual**

**1.0 Project Characteristics**

**1.1 Land Usage**

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Office Building	0.72	1000sqft	0.02	720.00	0

**1.2 Other Project Characteristics**

<b>Urbanization</b>	Urban	<b>Wind Speed (m/s)</b>	2.2	<b>Precipitation Freq (Days)</b>	58
<b>Climate Zone</b>	4	<b>Operational Year</b>	2021		
<b>Utility Company</b>	Pacific Gas & Electric Company				
<b>CO2 Intensity (lb/MW hr)</b>	331	<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 - Typical construction trailer for estimate of energy usage

CO2 Intensity Factor adjusted to reflect Marin Clean Energy's GHG Emissions Factors

Land Use - 12'x60' single-wide unit (720 sq ft)

Construction Phase - Typical construction trailer for energy use estimates - estimates are included in the operational component of the results

Off-road Equipment - Zeroed out construction equipment

Vehicle Trips - Zeroed out off-site trips

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	5.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	UsageHours	6.00	0.00
tblProjectCharacteristics	CO2IntensityFactor	641.35	331
tblVehicleTrips	ST_TR	2.46	0.00

tblVehicleTrips	SU_TR	1.05	0.00
tblVehicleTrips	WD_TR	11.03	0.00

## 5.0 Energy Detail

Historical Energy Use: N

### 5.3 Energy by Land Use - Electricity

#### Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	12837.6	1.9274	1.7000e-004	3.0000e-005	1.9421
<b>Total</b>		<b>1.9274</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>1.9421</b>

#### Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Office Building	12837.6	1.9274	1.7000e-004	3.0000e-005	1.9421
<b>Total</b>		<b>1.9274</b>	<b>1.7000e-004</b>	<b>3.0000e-005</b>	<b>1.9421</b>

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