Reche Canyon Road Extension to Hunts Lane Project
2021-156

Energy Consumption Analysis
Construction Off-Road Fuel Consumption

Phase Name	Off-Road Equipment	Quantity	Usage (hrs)	Horsepower (hp)	Load Factor	Fuel Consumption Rate (gallon/hr)[1]	Total Hours	Number of Days	Total Fuel Consumption (gallon)
Grubbing & Land Clearing	Crawler Tractors	1	8	87	0.43	2.16	8	56	967.0
Grubbing & Land Clearing	Excavators	1	8	36	0.38	0.79	8	56	353.6
Grubbing & Land Clearing	Signal Boards	1	7	6	0.82	0.28	7	56	111.3
Grading & Excavation	Crawler Tractors	1	8	87	0.43	2.16	8	230	3,971.7
Grading & Excavation	Excavators	3	8	36	0.38	0.79	24	230	4,357.1
Grading & Excavation	Graders	1	7	148	0.41	3.15	7	230	5,070.4
Grading & Excavation	Rollers	2	8	36	0.38	0.79	16	230	2,904.8
Grading & Excavation	Rubber Tired Loaders	2	7	150	0.36	2.80	14	230	9,024.4
Grading & Excavation	Scrapers	2	8	423	0.48	10.54	16	230	38,779.0
Grading & Excavation	Signal Boards	1	6	6	0.82	0.28	6	230	391.8
Grading & Excavation	Tractors/Loaders/Backhoes	2	8	84	0.37	1.79	16	230	6,599.4
Drainage, Utilities, & Sub-G	Air Compressors	1	8	37	0.48	1.02	8	110	901.8
Drainage, Utilities, & Sub-G	Generator Sets	1	8	14	0.74	0.60	8	110	526.0
Drainage, Utilities, & Sub-G	Graders	1	8	148	0.41	3.15	8	110	2,771.4
Drainage, Utilities, & Sub-G	Plate Compactors	1	8	8	0.43	0.20	8	110	174.7
Drainage, Utilities, & Sub-G	Pumps	1	8	11	0.74	0.47	8	110	413.3
Drainage, Utilities, & Sub-G	Rough Terrain Forklifts	1	9	96	0.4	2.22	9	110	2,193.5
Drainage, Utilities, & Sub-G	Scrapers	2	10	423	0.48	10.54	20	110	23,183.1
Drainage, Utilities, & Sub-G	Signal Boards	1	11	6	0.82	0.28	11	110	343.5
Drainage, Utilities, & Sub-G	Tractors/Loaders/Backhoes	2	12	84	0.37	1.79	24	110	4,734.4
Paving	Pavers	1	13	81	0.42	1.96	13	106	2,705.0
Paving	Paving Equipment	1	14	89	0.36	1.85	14	106	2,743.5
Paving	Rollers	3	15	36	0.38	0.79	45	106	3,765.1
Paving	Signal Boards	1	16	6	0.82	0.28	16	106	481.5
Paving	Tractors/Loaders/Backhoes	2	17	84	0.37	1.79	34	106	6,463.1
								Total Construction Off-Road Fuel (Diesel) Consumption (gallon)	***123,930***
								Countywide Off-Road Fuel (Diesel) Consumption (2025) (gallon)	***18,884,703***

Notes:

1. Fuel Consumption Rate = Horsepower x Load Factor x Fuel Consumption Factor

Fuel Consumption Factor: Brake Specific Fuel Capacity is converted from diesel lb/hp-hr to diesel gallon/hp-hr

Environmental Protection Agency, 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2*

2. Countywide off-road diesel consumption is from CARB's OFFROAD2021 (v1.0.5) Emissions Inventory.

Source: Refer to CalEEMod outputs for assumptions used in this analysis as well as equipment usage.

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2021-156

Energy Consumption Analysis
Construction On-Road Fuel Consumption

Worker Trips						
Phase Name	**Phase Length**	**# of Trips**	**Worker Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption (gallon)**
Grubbing & Land Clearing	56	5.0	18.5	5,180.0	**21.95082479**	*236.0*
Grading & Excavation	230	30.0	18.5	127,650.0		*5,815.3*
Drainage, Utilities, & Sub-Gr	110	25.0	18.5	50,875.0		*2,317.7*
Paving	106	17.5	18.5	34,317.5		*1,563.4*
					Worker Trips Total (Gasoline)	*9,932*

Vendor Trips						
Phase	**Phase Length**	**# of Trips**	**Vendor Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption (gallon)**
Grubbing & Land Clearing	56	0	0	0	**7.735957656**	*0.0*
Grading & Excavation	230	1	10	2346		*303.3*
Drainage, Utilities, & Sub-Gr	110	0	0	0		*0.0*
Paving	106	0	0	0		*0.0*
					Vendor Trips Total (Diesel)	*303*

Hauling Trips						
Phase	**Phase Length**	**# of Trips**	**Hauling Trip Length**	**Total VMT**	**Fuel Consumption Factor (Miles/Gallon/Day)**	**Total Fuel Consumption (gallon)**
Grubbing & Land Clearing	56	1	20	795.2	**7.735957656**	*6,151.6*
Grading & Excavation	230	2	20	8510.0		*65,833.0*
Drainage, Utilities, & Sub-Gr	110	1	20	2794.0		*21,614.3*
Paving	106	2	20	4006.8		*30,996.4*
					Hauling Trips Total (Diesel)	*124,595*
					Construction On-Road Diesel Consumption	***124,899***
					Construction Off-Road Diesel Consumption	***123,930***

Total Construction On-Road Gasoline Consumption (gallon)	**Total Construction Off-Road and On-Road Diesel Consumption (gallon)**
9,932	248,829
Countywide On-Road Gasoline Consumption (2025)	**Countywide Off-Road and On-Road Diesel Consumption (2025)**
783,723,468	324,691,701
Percentage Increase Countywide	
Gasoline Consumption[1]	**Diesel Consumption[1,2]**
0.0013%	0.0766%

Notes:

1. Countywide fuel consumption rates, on-road construction equipment diesel fuel consumption, and on-road fuel consumption are from CARB's EMFAC2025.
2. Countywide off-road fuel consumption is from CARB's OFFROAD2021 (v1.0.5) Emissions Inventory.

Source: Refer to CalEEMod outputs for assumptions used in this analysis.