

Appendix NRG

Energy Calculation Sheets

Rezoning Sites for Housing

Last Updated: October 26, 2020

Compression-Ignition Engine Brake-Specific Fuel Consumption (BSFC) Factors [1]:

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529
--------------	--------	----------------------	--------

Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT						
Construction Equipment	#	Hours per Day	Horsepower	Load Factor	Construction Phase	Fuel Used (gallons)
Concrete/Industrial Saws	1	8	81	0.73	Demo	4,169.67
Excavators	3	8	158	0.38	Demo	11,425.15
Rubber Tired Dozer	2	8	247	0.40	Demo	12,533.92
Rubber Tired Dozer	3	8	247	0.40	Site Prep	18,800.89
Tractors/Loaders/Backhoes	4	8	97	0.37	Site Prep	10,123.43
Excavators	2	8	158	0.38	Grading	22,850.31
Graders	1	8	187	0.41	Grading	14,589.72
Rubber Tired Dozer	1	8	247	0.40	Grading	18,800.89
Scrapers	2	8	367	0.48	Grading	67,043.81
Tractors/Loaders/Backhoes	2	8	97	0.37	Grading	15,185.15
Cranes	1	7	231	0.29	Building	24,787.17
Forklifts	3	8	89	0.20	Building	25,104.08
Generator Sets	1	8	84	0.74	Building	29,222.27
Tractors/Loaders/Backhoes	3	7	97	0.37	Building	44,290.01
Welders	1	8	46	0.45	Building	9,731.36
Air Compressors	1	6	78	0.48	Arch Coating	3,960.24
Pavers	2	8	130	0.42	Paving	13,853.29
Paving Equipment	2	8	132	0.36	Paving	12,056.93
Rollers	2	8	80	0.38	Paving	8,574.88
Total Fuel Used						367,103.15
						(Gallons)

Construction Phase	Days of Operation
Demolition Phase	150
Site Preparation Phase	150
Grading Phase	450
Building Construction Phase	1,000
Paving Phase	300
Architectural Coating Phase	300
Total Days	2,350

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	24.4	15	10.8	995.90
Site Prep Phase	24.4	18	10.8	1,195.08
Grading Phase	24.4	20	10.8	3,983.61
Building Phase	24.4	1,071	10.8	474,049.18
Paving Phase	24.4	15	10.8	1,991.80
Architectural Coating Phase	24.4	214	10.8	28,416.39
Total				510,631.97

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Demolition	7.5	3,411	20.0	9,096.00
Site Prep Phase	7.5	-	20.0	-
Grading Phase	7.5	10,800	20.0	28,800.00
Building Phase	7.5	-	20.0	-
Paving Phase	7.5	-	20.0	-
Architectural Coating Phase	7.5	-	20.0	-
Total				37,896.00

VENDOR TRIPS				
Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition	7.5	-	7.3	-
Site Prep Phase	7.5	-	7.3	-
Grading Phase	7.5	-	7.3	-
Building Phase	7.5	318	7.3	309,520.00
Paving Phase	7.5	-	7.3	-
Architectural Coating Phase	7.5	-	7.3	-
Total				309,520.00

Total Gasoline Consumption (gallons)	510,631.97
Total Diesel Consumption (gallons)	714,519.15

Sources:

[1] United States Environmental Protection Agency. 2018. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b* . July 2018. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P100UXEN.pdf>.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2018. *National Transportation Statistics 2018* . Available at: <https://www.bts.gov/topics/national-transportation-statistics>.

Rezoning Sites for Housing

Last Updated: October 26, 2020

Populate one of the following tables (Leave the other blank):

Annual VMT	OR	Daily Vehicle Trips
Annual VMT: 34,011,855		Daily Vehicle Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG)	
Light Duty Auto (LDA)	0.625329	Passenger Vehicles	24.4
Light Duty Truck 1 (LDT1)	0.031298	Light-Med Duty Trucks	17.9
Light Duty Truck 2 (LDT2)	0.162135	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.089092	Motorcycles	44.0
Light Heavy Duty 1 (LHD1)	0.014618		
Light Heavy Duty 2 (LHD2)	0.004632		
Medium Heavy Duty (MHD)	0.032111		
Heavy Heavy Duty (HHD)	0.030354		
Other Bus (OBUS)	0.003196		
Urban Bus (UBUS)	0.001373		
School Bus (SBUS)	0.000897		
Motorhome (MH)	0.000662		
Motorcycle (MCY)	0.004305		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	62.53%	<i>Gasoline</i>	21,268,599	0.00	871,663.90
Light-Medium Duty Trucks	28.25%	<i>Gasoline</i>	9,609,199	0.00	536,826.78
Heavy Trucks/Other	8.78%	<i>Diesel</i>	2,987,703	0.00	398,360.45
Motorcycle	0.43%	<i>Gasoline</i>	146,421	0.00	3,327.75

Total Gasoline Consumption (gallons)	1,411,818.43
Total Diesel Consumption (gallons)	398,360.45