

Freedom Blvd Campus Master Plan

Last Updated: 08/17/2022

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

HP: 0 to 100	0.0588	HP: Greater than 100	0.0529
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Values above are expressed in gallons per horsepower-hour/BSFC.

CONSTRUCTION EQUIPMENT

Construction Equipment	#	Hours per		Load Factor	Construction Phase	Fuel Used (gallons)
		Day	Horsepower			
Concrete/Industrial Saws	1	8	81	0.73	Demolition Phase	528
Rubber Tired Dozers	1	8	247	0.4	Demolition Phase	794
Tractors/Loaders/Backhoes	3	8	97	0.37	Demolition Phase	962
Graders	1	8	187	0.41	Site Preparation Phase	97
Tractors/Loaders/Backhoes	1	7	97	0.37	Site Preparation Phase	44
Scrapers	1	8	367	0.48	Site Preparation Phase	223
Graders	1	8	187	0.41	Grading Phase	195
Rubber Tired Dozers	1	8	247	0.4	Grading Phase	251
Tractors/Loaders/Backhoes	2	7	97	0.37	Grading Phase	177
Cranes	1	8	231	0.29	Building Construction Phase	6,034
Forklifts	2	7	89	0.2	Building Construction Phase	3,119
Welders	3	8	46	0.45	Building Construction Phase	6,218
Generator Sets	1	8	84	0.74	Building Construction Phase	6,224
Tractors/Loaders/Backhoes	1	6	97	0.37	Building Construction Phase	2,695
Air Compressors	1	6	78	0.48	Architectural Coating Phase	132
Cement and Mortar Mixers	1	8	9	0.56	Paving Phase	24
Pavers	1	8	130	0.42	Paving Phase	231
Tractors/Loaders/Backhoes	1	7	97	0.37	Paving Phase	148
Paving Equipment	1	8	132	0.36	Paving Phase	201
Rollers	2	8	80	0.38	Paving Phase	286

First Year Fuel Used **28,583**
(Gallons)

Construction Phase	Days of Operation
Demolition Phase	19
Site Preparation Phase	3
Grading Phase	6
Building Construction Phase	213
Paving Phase	10
Architectural Coating Phase	10
Total Days	261

Total Fuel Used **114,333**
(Gallons)

WORKER TRIPS

Constuction Phase	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
Demolition Phase	24.1	13	10.8	110.69
Site Preparation Phase	24.1	8	10.8	10.76
Grading Phase	24.1	10	10.8	26.89
Building Construction Phase	24.1	59	10.8	5631.68
Paving Phase	24.1	15	10.8	67.22
Architectural Coating Phase	24.1	12	10.8	53.78

Annual **5,901.01**

Fuel 23,604.05

HAULING AND VENDOR TRIPS

Trip Class	MPG [2]	Trips	Trip Length (miles)	Fuel Used (gallons)
HAULING TRIPS				
Demolition Phase	7.5	241	20.0	642.67
Site Preparation Phase	7.5	0	20.0	0.00
Grading Phase	7.5	0	20.0	0.00
Building Construction Phase	7.5	0	20.0	0.00
Paving Phase	7.5	0	20.0	0.00
Architectural Coating Phase	7.5	0	20.0	0.00
Fuel				642.67
VENDOR TRIPS				
Demolition Phase	7.5	0	14.7	0.00
Site Preparation Phase	7.5	0	14.7	0.00
Grading Phase	7.5	17	7.3	99.28
Building Construction Phase	7.5	0	14.7	0.00
Paving Phase	7.5	0	14.7	0.00
Architectural Coating Phase	7.5	0	14.7	0.00
Annual				99.28
Fuel				397.12

Total Gasoline Consumption (gallons)	23,604
Total Diesel Consumption (gallons)	117,301

Sources:

[1] United States Environmental Protection Agency. 2021. *Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES3.0.2*. September. Available at: <https://www.epa.gov/system/files/documents/2021-08/420r21021.pdf>.

[2] United States Department of Transportation, Bureau of Transportation Statistics. 2021. *National Transportation Statistics*. Available at: <https://www.bts.gov/topics/national-transportation-statistics>.

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

Annual VMT	OR	Daily Vehicle Trips
Annual VMT: 6,756,547		Daily Vehicle Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]	
Light Duty Auto (LDA)	0.528356	Passenger Vehicles	24.0
Light Duty Truck 1 (LDT1)	0.053553	Light-Med Duty Trucks	17.9
Light Duty Truck 2 (LDT2)	0.192311	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.140981	Motorcycles	44
Light Heavy Duty 1 (LHD1)	0.025845		
Light Heavy Duty 2 (LHD2)	0.006434		
Medium Heavy Duty (MHD)	0.010672		
Heavy Heavy Duty (HHD)	0.009485		
Other Bus (OBUS)	0.001155		
Urban Bus (UBUS)	0.000563		
Motorcycle (MCY)	0.026223		
School Bus (SBUS)	0.001221		
Motorhome (MH)	0.003200		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT:		Fuel
			VMT	Vehicle Trips: VMT	Consumption (Gallons)
Passenger Vehicles	52.84%	Gasoline	3569862	0.00	148744.26
Light-Medium Duty Trucks	38.68%	Gasoline	2613736	0.00	146018.79
Heavy Trucks/Other	5.86%	Diesel	395765	0.00	52768.63
Motorcycle	2.62%	Gasoline	177177	0.00	4026.75

Total Gasoline Consumption (gallons)	298,789.80
Total Diesel Consumption (gallons)	52,768.63

Sources:

[1] United States Department of Transportation, Bureau of Transportation Statistics. 2019. National Transportation Statistics 2019. Available at: <https://www.bts.gov/topics/national-transportation-statistics>.