

# Appendix D

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Energy Calculations

# 9600 Wilshire Boulevard Existing

Last Updated: 6/2/2023

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

<b>Annual VMT</b>	<b>OR</b>	<b>Daily Vehicle Trips</b>
Annual VMT: 1,348,898		Daily Vehicle Trips: 1092 Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]	
Light Duty Auto (LDA)	0.614490	Passenger Vehicles	24.1
Light Duty Truck 1 (LDT1)	0.052730	Light-Med Duty Trucks	17.6
Light Duty Truck 2 (LDT2)	0.299260	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.000000	Motorcycles	44
Light Heavy Duty 1 (LHD1)	0.000000		
Light Heavy Duty 2 (LHD2)	0.000000		
Medium Heavy Duty (MHD)	0.000000		
Heavy Heavy Duty (HHD)	0.000000		
Other Bus (OBUS)	0.001053		
Urban Bus (UBUS)	0.000771		
Motorcycle (MCY)	0.027410		
School Bus (SBUS)	0.000809		
Motorhome (MH)	0.003464		

4.332662802

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	61.45%	Gasoline	828,884	0.00	34,394
Light-Medium Duty Trucks	35.20%	Gasoline	474,799	0.00	26,977
Heavy Trucks/Other	0.61%	Diesel	8,224	0.00	1,097
Motorcycle	2.74%	Gasoline	36,973	0.00	840

<b>Total Gasoline Consumption (gallons)</b>	<b>62,211</b>
<b>Total Diesel Consumption (gallons)</b>	<b>1,097</b>

**Sources:**

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

# 9600 Wilshire Boulevard - Scenario 1

1/26/2024

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		Load Factor	Construction Phase	Fuel Used (gallons)
		Hours per Day	Horsepower			
Cement and Mortar Mixers	1	10	10	0.56	Utility Relocation	1,000
Concrete/Industrial Saws	1	10	33	0.73	Utility Relocation	4,304
Excavators	1	10	36	0.38	Utility Relocation	2,444
Generator Sets	2	10	14	0.74	Utility Relocation	3,701
Pavers	1	10	81	0.42	Utility Relocation	6,077
Paving Equipment	1	10	89	0.36	Utility Relocation	5,724
Tractors/Loaders/Backhoes	1	10	84	0.37	Demolition	785
Concrete/Industrial Saws	2	10	33	0.73	Demolition	1,217
Air Compressors	2	10	37	0.48	Demolition	898
Crawler Tractors	2	10	87	0.43	Demolition	1,891
Crushing/Proc. Equipment	1	10	12	0.85	Demolition	258
Excavators	1	10	36	0.38	Demolition	346
Rubber Tired Loaders	1	10	150	0.36	Demolition	1,227
Off-Highway Trucks	4	10	376	0.38	Demolition	12,990
Tractors/Loaders/Backhoes	3	10	84	0.37	Grading/Excavation	19,068
Bore/Drill Rigs	2	10	83	0.5	Grading/Excavation	16,973
Concrete/Industrial Saws	2	10	33	0.73	Grading/Excavation	9,853
Crawler Tractors	2	10	87	0.43	Grading/Excavation	15,301
Excavators	1	10	36	0.38	Grading/Excavation	2,798
Rubber Tired Loaders	1	10	150	0.36	Grading/Excavation	9,933
Off-Highway Trucks	6	10	376	0.38	Grading/Excavation	157,696
Air Compressors	2	10	37	0.48	Grading/Excavation	7,264
Tractors/Loaders/Backhoes	2	10	84	0.37	Building Construction Phase	12,712
Air Compressors	2	10	37	0.48	Building Construction Phase	7,264
Plate Compactors	2	10	8	0.43	Building Construction Phase	1,407
Dumpers/Tenders	2	10	16	0.38	Building Construction Phase	2,487
Rubber Tired Dozers	2	10	367	0.4	Building Construction Phase	54,008
Pumps	2	10	11	0.74	Building Construction Phase	3,329
Trenchers	2	10	40	0.5	Building Construction Phase	8,180
Excavators	2	10	36	0.38	Building Construction Phase	5,595
Aerial Lifts	0	0	0	0	Building Construction Phase	0
Cement and Mortar Mixers	1	10	10	0.56	Paving	145
Pavers	1	10	81	0.42	Paving	880
Paving Equipment	1	10	89	0.36	Paving	828
Dumpers/Tenders	2	10	16	0.38	Paving	314
Pressure Washers	1	10	14	0.3	Paving	109
Sweepers/Scrubbers	1	10	36	0.46	Paving	428
<b>Total Fuel Used</b>						<b>379,433</b> (Gallons)

Construction Phase	Days of Operation
Utility Relocation	304
Demolition	43
Grading/Excavation	348
Building Construction	348
Paving	44
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Total Days	1087
Total Construction Days	1087

**WORKER TRIPS**

<b>Constuction Phase</b>	<b>MPG [2]</b>	<b>Trips</b>	<b>Trip Length (miles)</b>	<b>Fuel Used (gallons)</b>
Max Workers Per Day	24.1	350	18.5	292046.68
<b>Total Fuel Used</b>				<b>292,046.68</b>

**HAULING AND VENDOR TRIPS**

<b>Trip Class</b>	<b>MPG [2]</b>	<b>Trips</b>	<b>Trip Length (miles)</b>	<b>Fuel Used (gallons)</b>
<b>HAULING TRIPS</b>				
Utility Relocation	7.5		20.0	0.00
Demolition	7.5	418	65.0	3622.67
Grading/Excavation	7.5	31200	65.0	270400.00
Building Construction	7.5	0	20.0	0.00
Paving	7.5	0	20.0	0.00
<b>Total Fuel Used</b>				<b>274,022.67</b>
<b>VENDOR TRIPS</b>				
Utility Relocation	7.5	0	10.2	0.00
Demolition	7.5	0	10.2	0.00
Grading/Excavation	7.5			0.00
Building Construction	7.5	112	10.2	53007.36
Paving	7.5	0	10.2	0.00
<b>Total Fuel Used</b>				<b>53,007.36</b>

<b>Total Gasoline Consumption (gallons)</b>	<b>292,047</b>
<b>Total Diesel Consumption (gallons)</b>	<b>706,463</b>

**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>.

# 9600 Wilshire Boulevard - Scenario 1

1/26/2024

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

<b>Annual VMT</b>	<b>OR</b>	<b>Daily Vehicle Trips</b>
Annual VMT: 9,130,396		Daily Vehicle Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]	
Light Duty Auto (LDA)	0.614490	Passenger Vehicles	24.1
Light Duty Truck 1 (LDT1)	0.052730	Light-Med Duty Trucks	17.6
Light Duty Truck 2 (LDT2)	0.299260	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.000000	Motorcycles	44
Light Heavy Duty 1 (LHD1)	0.000000		
Light Heavy Duty 2 (LHD2)	0.000000		
Medium Heavy Duty (MHD)	0.000000		
Heavy Heavy Duty (HHD)	0.000000		
Other Bus (OBUS)	0.001053		
Urban Bus (UBUS)	0.000771		
Motorcycle (MCY)	0.027410		
School Bus (SBUS)	0.000809		
Motorhome (MH)	0.003464		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	61.45%	<i>Gasoline</i>	5,610,537	0.00	232,802
Light-Medium Duty Trucks	35.20%	<i>Gasoline</i>	3,213,808	0.00	182,603
Heavy Trucks/Other	0.61%	<i>Diesel</i>	55,666	0.00	7,422
Motorcycle	2.74%	<i>Gasoline</i>	250,264	0.00	5,688

<b>Total Gasoline Consumption (gallons)</b>	<b>421,093</b>
<b>Total Diesel Consumption (gallons)</b>	<b>7,422</b>

**Sources:**

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

# 9600 Wilshire Boulevard - Scenario 2

1/26/2024

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			
Cement and Mortar Mixers	1	10	10	0.56	Utility Relocation	1,000
Concrete/Industrial Saws	1	10	33	0.73	Utility Relocation	4,304
Excavators	1	10	36	0.38	Utility Relocation	2,444
Generator Sets	2	10	14	0.74	Utility Relocation	3,701
Pavers	1	10	81	0.42	Utility Relocation	6,077
Paving Equipment	1	10	89	0.36	Utility Relocation	5,724
Tractors/Loaders/Backhoes	1	10	84	0.37	Demolition	785
Concrete/Industrial Saws	2	10	33	0.73	Demolition	1,217
Air Compressors	2	10	37	0.48	Demolition	898
Crawler Tractors	2	10	87	0.43	Demolition	1,891
Crushing/Proc. Equipment	1	10	12	0.85	Demolition	258
Excavators	1	10	36	0.38	Demolition	346
Rubber Tired Loaders	1	10	150	0.36	Demolition	1,227
Off-Highway Trucks	4	10	376	0.38	Demolition	12,990
Tractors/Loaders/Backhoes	3	10	84	0.37	Grading/Excavation	19,068
Bore/Drill Rigs	2	10	83	0.5	Grading/Excavation	16,973
Concrete/Industrial Saws	2	10	33	0.73	Grading/Excavation	9,853
Crawler Tractors	2	10	87	0.43	Grading/Excavation	15,301
Excavators	1	10	36	0.38	Grading/Excavation	2,798
Rubber Tired Loaders	1	10	150	0.36	Grading/Excavation	9,933
Off-Highway Trucks	6	10	376	0.38	Grading/Excavation	157,696
Air Compressors	2	10	37	0.48	Grading/Excavation	7,264
Tractors/Loaders/Backhoes	2	10	84	0.37	Building Construction Phase	12,712
Air Compressors	2	10	37	0.48	Building Construction Phase	7,264
Plate Compactors	2	10	8	0.43	Building Construction Phase	1,407
Dumpers/Tenders	2	10	16	0.38	Building Construction Phase	2,487
Rubber Tired Dozers	2	10	367	0.4	Building Construction Phase	54,008
Pumps	2	10	11	0.74	Building Construction Phase	3,329
Trenchers	2	10	40	0.5	Building Construction Phase	8,180
Excavators	2	10	36	0.38	Building Construction Phase	5,595
Aerial Lifts	0	0	0	0	Building Construction Phase	0
Cement and Mortar Mixers	1	10	10	0.56	Paving	145
Pavers	1	10	81	0.42	Paving	880
Paving Equipment	1	10	89	0.36	Paving	828
Dumpers/Tenders	2	10	16	0.38	Paving	314
Pressure Washers	1	10	14	0.3	Paving	109
Sweepers/Scrubbers	1	10	36	0.46	Paving	428
<b>Total Fuel Used</b>						<b>379,433</b>
						<b>(Gallons)</b>

Construction Phase	Days of Operation
Utility Relocation	304
Demolition	43
Grading/Excavation	348
Building Construction	348
Paving	44
<hr/>	
Total Days	1087
Total Construction Days	1087

**WORKER TRIPS**

<b>Constuction Phase</b>	<b>MPG [2]</b>	<b>Trips</b>	<b>Trip Length (miles)</b>	<b>Fuel Used (gallons)</b>
Max Workers Per Day	24.1	350	18.5	292046.68
<b>Total Fuel Used</b>				<b>292,046.68</b>

**HAULING AND VENDOR TRIPS**

<b>Trip Class</b>	<b>MPG [2]</b>	<b>Trips</b>	<b>Trip Length (miles)</b>	<b>Fuel Used (gallons)</b>
<b>HAULING TRIPS</b>				
Utility Relocation	7.5		20.0	0.00
Demolition	7.5	418	65.0	3622.67
Grading/Excavation	7.5	31200	65.0	270400.00
Building Construction	7.5	0	20.0	0.00
Paving	7.5	0	20.0	0.00
<b>Total Fuel Used</b>				<b>274,022.67</b>
<b>VENDOR TRIPS</b>				
Utility Relocation	7.5	0	10.2	0.00
Demolition	7.5	0	10.2	0.00
Grading/Excavation	7.5			0.00
Building Construction	7.5	114	10.2	54187.39
Paving	7.5	0	10.2	0.00
<b>Total Fuel Used</b>				<b>54,187.39</b>

<b>Total Gasoline Consumption (gallons)</b>	<b>292,047</b>
<b>Total Diesel Consumption (gallons)</b>	<b>707,643</b>

**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>.

# 9600 Wilshire Boulevard - Scenario 2

1/26/2024

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

<b>Annual VMT</b>	<b>OR</b>	<b>Daily Vehicle Trips</b>
Annual VMT: 16,414,818		Daily Vehicle Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]	
Light Duty Auto (LDA)	0.614490	Passenger Vehicles	24.1
Light Duty Truck 1 (LDT1)	0.052730	Light-Med Duty Trucks	17.6
Light Duty Truck 2 (LDT2)	0.299260	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.000000	Motorcycles	44
Light Heavy Duty 1 (LHD1)	0.000000		
Light Heavy Duty 2 (LHD2)	0.000000		
Medium Heavy Duty (MHD)	0.000000		
Heavy Heavy Duty (HHD)	0.000000		
Other Bus (OBUS)	0.001053		
Urban Bus (UBUS)	0.000771		
Motorcycle (MCY)	0.027410		
School Bus (SBUS)	0.000809		
Motorhome (MH)	0.003464		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	61.45%	<i>Gasoline</i>	10,086,742	0.00	418,537
Light-Medium Duty Trucks	35.20%	<i>Gasoline</i>	5,777,852	0.00	328,287
Heavy Trucks/Other	0.61%	<i>Diesel</i>	100,078	0.00	13,344
Motorcycle	2.74%	<i>Gasoline</i>	449,930	0.00	10,226

<b>Total Gasoline Consumption (gallons)</b>	<b>757,050</b>
<b>Total Diesel Consumption (gallons)</b>	<b>13,344</b>

**Sources:**

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

# 9600 Wilshire Boulevard - Scenario 3

1/26/2024

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			
Cement and Mortar Mixers	1	10	10	0.56	Utility Relocation	1,000
Concrete/Industrial Saws	1	10	33	0.73	Utility Relocation	4,304
Excavators	1	10	36	0.38	Utility Relocation	2,444
Generator Sets	2	10	14	0.74	Utility Relocation	3,701
Pavers	1	10	81	0.42	Utility Relocation	6,077
Paving Equipment	1	10	89	0.36	Utility Relocation	5,724
Tractors/Loaders/Backhoes	1	10	84	0.37	Demolition	785
Concrete/Industrial Saws	2	10	33	0.73	Demolition	1,217
Air Compressors	2	10	37	0.48	Demolition	898
Crawler Tractors	2	10	87	0.43	Demolition	1,891
Crushing/Proc. Equipment	1	10	12	0.85	Demolition	258
Excavators	1	10	36	0.38	Demolition	346
Rubber Tired Loaders	1	10	150	0.36	Demolition	1,227
Off-Highway Trucks	4	10	376	0.38	Demolition	12,990
Tractors/Loaders/Backhoes	3	10	84	0.37	Grading/Excavation	19,068
Bore/Drill Rigs	2	10	83	0.5	Grading/Excavation	16,973
Concrete/Industrial Saws	2	10	33	0.73	Grading/Excavation	9,853
Crawler Tractors	2	10	87	0.43	Grading/Excavation	15,301
Excavators	1	10	36	0.38	Grading/Excavation	2,798
Rubber Tired Loaders	1	10	150	0.36	Grading/Excavation	9,933
Off-Highway Trucks	6	10	376	0.38	Grading/Excavation	157,696
Air Compressors	2	10	37	0.48	Grading/Excavation	7,264
Tractors/Loaders/Backhoes	2	10	84	0.37	Building Construction Phase	12,712
Air Compressors	2	10	37	0.48	Building Construction Phase	7,264
Plate Compactors	2	10	8	0.43	Building Construction Phase	1,407
Dumpers/Tenders	2	10	16	0.38	Building Construction Phase	2,487
Rubber Tired Dozers	2	10	367	0.4	Building Construction Phase	54,008
Pumps	2	10	11	0.74	Building Construction Phase	3,329
Trenchers	2	10	40	0.5	Building Construction Phase	8,180
Excavators	2	10	36	0.38	Building Construction Phase	5,595
Aerial Lifts	0	0	0	0	Building Construction Phase	0
Cement and Mortar Mixers	1	10	10	0.56	Paving	145
Pavers	1	10	81	0.42	Paving	880
Paving Equipment	1	10	89	0.36	Paving	828
Dumpers/Tenders	2	10	16	0.38	Paving	314
Pressure Washers	1	10	14	0.3	Paving	109
Sweepers/Scrubbers	1	10	36	0.46	Paving	2,958
<b>Total Fuel Used</b>						<b>381,963</b>
						<b>(Gallons)</b>

Construction Phase	Days of Operation
Utility Relocation	304
Demolition	43
Grading/Excavation	348
Building Construction	348
Paving	44
<hr/>	
Total Days	1087
Total Construction Days	1087

**WORKER TRIPS**

<b>Constuction Phase</b>	<b>MPG [2]</b>	<b>Trips</b>	<b>Trip Length (miles)</b>	<b>Fuel Used (gallons)</b>
Max Workers Per Day	24.1	350	18.5	292046.68
<b>Total Fuel Used</b>				<b>292,046.68</b>

**HAULING AND VENDOR TRIPS**

<b>Trip Class</b>	<b>MPG [2]</b>	<b>Trips</b>	<b>Trip Length (miles)</b>	<b>Fuel Used (gallons)</b>
<b>HAULING TRIPS</b>				
Utility Relocation	7.5		20.0	0.00
Demolition	7.5	420	65.0	3640.00
Grading/Excavation	7.5	31200	65.0	270400.00
Building Construction	7.5	0	20.0	0.00
Paving	7.5	0	20.0	0.00
<b>Total Fuel Used</b>				<b>274,040.00</b>
<b>VENDOR TRIPS</b>				
Utility Relocation	7.5	0	10.2	0.00
Demolition	7.5	0	10.2	0.00
Grading/Excavation	7.5			0.00
Building Construction	7.5	103	10.2	48665.69
Paving	7.5	0	10.2	0.00
<b>Total Fuel Used</b>				<b>48,665.69</b>

<b>Total Gasoline Consumption (gallons)</b>	<b>292,047</b>
<b>Total Diesel Consumption (gallons)</b>	<b>704,668</b>

**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>.

# 9600 Wilshire Boulevard - Scenario 3

1/26/2024

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

<b>Annual VMT</b>	<b>OR</b>	<b>Daily Vehicle Trips</b>
Annual VMT: 13,707,258		Daily Vehicle Trips: Average Trip Distance:

Fleet Class	Fleet Mix	Fuel Economy (MPG) [1]	
Light Duty Auto (LDA)	0.614490	Passenger Vehicles	24.1
Light Duty Truck 1 (LDT1)	0.052730	Light-Med Duty Trucks	17.6
Light Duty Truck 2 (LDT2)	0.299260	Heavy Trucks/Other	7.5
Medium Duty Vehicle (MDV)	0.000000	Motorcycles	44
Light Heavy Duty 1 (LHD1)	0.000000		
Light Heavy Duty 2 (LHD2)	0.000000		
Medium Heavy Duty (MHD)	0.000000		
Heavy Heavy Duty (HHD)	0.000000		
Other Bus (OBUS)	0.001053		
Urban Bus (UBUS)	0.000771		
Motorcycle (MCY)	0.027410		
School Bus (SBUS)	0.000809		
Motorhome (MH)	0.003464		

Fleet Mix					
Vehicle Type	Percent	Fuel Type	Annual VMT: VMT	Vehicle Trips: VMT	Fuel Consumption (Gallons)
Passenger Vehicles	61.45%	<i>Gasoline</i>	8,422,973	0.00	349,501
Light-Medium Duty Trucks	35.20%	<i>Gasoline</i>	4,824,818	0.00	274,137
Heavy Trucks/Other	0.61%	<i>Diesel</i>	83,571	0.00	11,143
Motorcycle	2.74%	<i>Gasoline</i>	375,716	0.00	8,539

<b>Total Gasoline Consumption (gallons)</b>	<b>632,177</b>
<b>Total Diesel Consumption (gallons)</b>	<b>11,143</b>

**Sources:**

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