Low Volume Road Noise Calculation Tool (LVRCT)

Gannett Fleming

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LVRCT Introduction

- Hosted on the TNM 2.5 download site
- Download at: https://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_v25/
- TNM 2.5 to TNM 3 conversion tool at same site

LVRCT Software

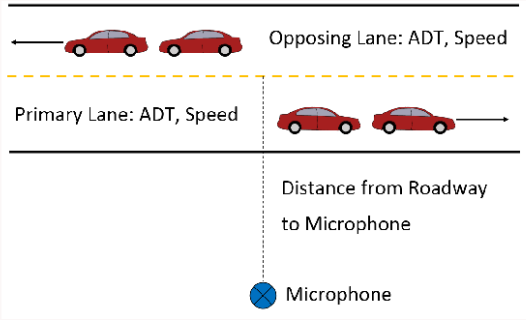
- Requires installation of MCRInstaller.exe
  - Provides MATLAB Runtime Libraries
  - No license fee
- Requires installation of LowVolumeTool.exe
  - No license fee

LVRCT Software

- Uses draft TNM 3.0 acoustics
- Two bi-directional infinite roadways
  - Input speed from 25-70 mph in 5 mph increments
  - Input roadway gradient of 0-7%
  - Input vehicle mix and volume

LVRCT Software

- Final version released with final TNM 3 acoustics library
- Anticipate use for noise screening and low volume roadways
- Send comments or questions to TNMComments@dot.gov



	Primary Lane		Opposing Lane
Characteristics			
Pavement Type	Average		Average
Grade (%)	0		0
Traffic			
Lane Average Speed (mph)	--		--
Average Traffic (# Vehicles)	0 Hourly / Daily		0 Hourly / Daily
Cars (% of Total Volume)	0 %		0 %
Medium Trucks (% of Total Volume)	0 %		0 %
Heavy Trucks (% of Total Volume)	0 %		0 %

Receiver Distance from Roadway (ft) --

Noise Abatement Criteria Activity Category: --

*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

Primary Lane Noise (LAeq, 1 hour)	Total Noise (LAeq, 1 hour)	Opposing Lane Noise (LAeq, 1 hour)
dBA	dBA	dBA

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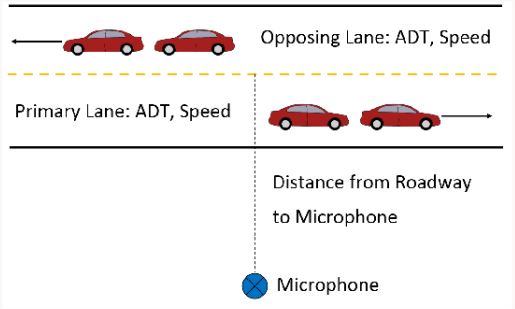
TNM Low Volume Tool



Primary Lane

Opposing Lane

Characteristics

Primary Lane		Opposing Lane
Average / Average	Pavement Type	Average
0	Grade (%)	0

Traffic

Primary Lane		Opposing Lane
--	Lane Average Speed (mph)	--
0 Hourly Daily	Average Traffic (# Vehicles)	0 Hourly Daily
0 %	Cars (% of Total Volume)	0 %
0 %	Medium Trucks (% of Total Volume)	0 %
0 %	Heavy Trucks (% of Total Volume)	0 %

Receiver Distance from Roadway (ft) --

Noise Abatement Criteria Activity Category: --

*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

Primary Lane Noise (LAeq, 1 hour)		Opposing Lane Noise (LAeq, 1 hour)
dBA	Total Noise (LAeq, 1 hour)	dBA
	dBA	

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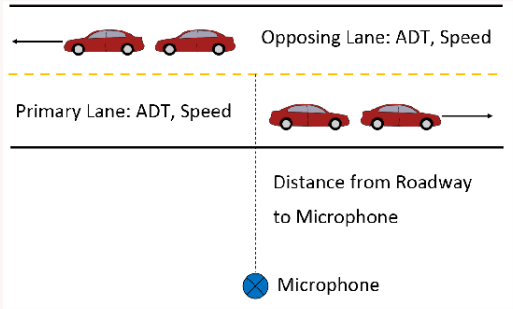
TNM Low Volume Tool



Primary Lane

Opposing Lane

Characteristics

Primary Lane		Opposing Lane
Average	Pavement Type	Average
0	Grade (%)	0

Traffic

	Lane Average Speed (mph)	--
Hourly / Daily	Average Traffic (# Vehicles)	0 Hourly / Daily
%	Cars (% of Total Volume)	0 %
%	Medium Trucks (% of Total Volume)	0 %
%	Heavy Trucks (% of Total Volume)	0 %

Receiver Distance from Roadway (ft) --

Noise Abatement Criteria Activity Category: --

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dBA	dBA	dBA

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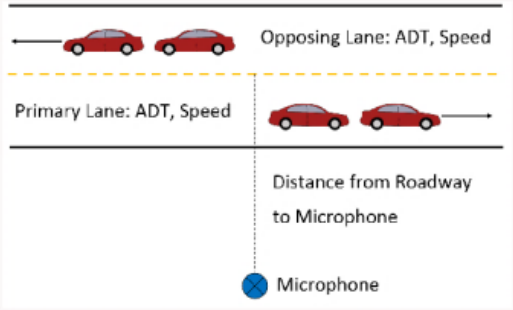
TNM Low Volume Tool



Primary Lane | Opposing Lane

Characteristics

Primary Lane		Opposing Lane
Average	Pavement Type	Average
0	Grade (%)	0

Traffic

Primary Lane		Opposing Lane
-- (25, 30, 35, 40, 45, 50, 55, 60, 65, 70)	Lane Average Speed (mph)	--
Hourly / Daily	Average Traffic (# Vehicles)	0 Hourly / Daily
%	Cars (% of Total Volume)	0 %
%	Medium Trucks (% of Total Volume)	0 %
%	Heavy Trucks (% of Total Volume)	0 %

ceiver Distance from Roadway (ft) --

Noise Abatement Criteria Activity Category: --

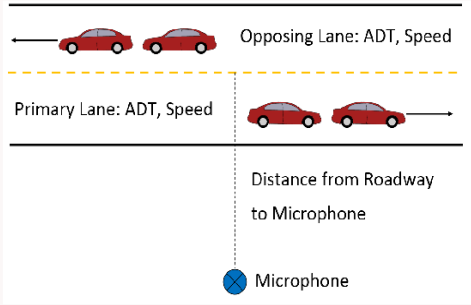
*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

Primary Lane Noise (LAeq, 1 hour)	Total Noise (LAeq, 1 hour)	Opposing Lane Noise (LAeq, 1 hour)
dBA	dBA	dBA

TNM Low Volume Tool



Primary Lane		Opposing Lane
Characteristics		
Average	Pavement Type	Average
0	Grade (%)	0
Traffic		
--	Lane Average Speed (mph)	--
500 Hourly Daily	Average Traffic (# Vehicles)	500 Hourly Daily
90 %	Cars (% of Total Volume)	90 %
3 %	Medium Trucks (% of Total Volume)	3 %
7 %	Heavy Trucks (% of Total Volume)	7 %

Receiver Distance from Roadway (ft) --

Noise Abatement Criteria Activity Category: --

*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

Primary Lane Noise (LAeq, 1 hour)		Opposing Lane Noise (LAeq, 1 hour)
dBA	Total Noise (LAeq, 1 hour)	dBA
	dBA	

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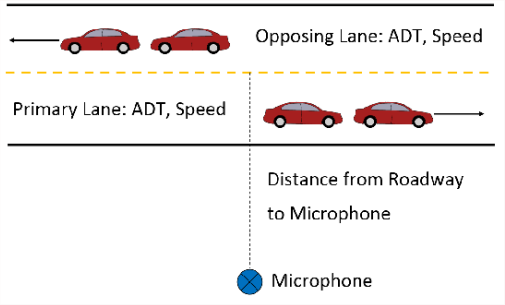
TNM Low Volume Tool



Primary Lane | Opposing Lane

Characteristics

Primary Lane		Opposing Lane
Average	Pavement Type	Average
0	Grade (%)	0

Traffic

Primary Lane		Opposing Lane
--	Lane Average Speed (mph)	--
500 Hourly Daily	Average Traffic (# Vehicles)	500 Hourly Daily
90 %	Cars (% of Total Volume)	90 %
3 %	Medium Trucks (% of Total Volume)	3 %
7 %	Heavy Trucks (% of Total Volume)	7 %

Receiver Distance from Roadway (ft): 50

Noise Abatement Criteria Activity Category:
*23 CFR Part 772 Table 1

-- / 25 / 50 / 100 / 200 / 300 / 400 / 500

Calculate Noise (LAeq, 1

Results

Primary Lane Noise (LAeq, 1 hour)		Opposing Lane Noise (LAeq, 1 hour)
dBA	Total Noise (LAeq, 1 hour)	dBA
	dBA	

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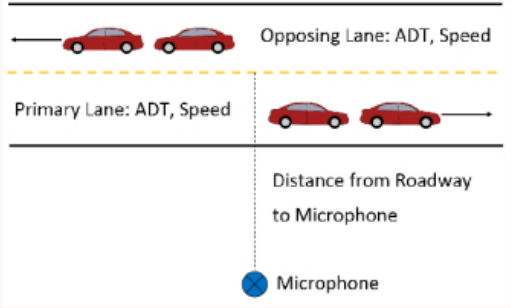
TNM Low Volume Tool
Opposing Lane: ADT, Speed
Primary Lane: ADT, Speed
Distance from Roadway to Microphone
Microphone
Primary Lane
Opposing Lane
Characteristics
Pavement Type
Average
Average
Grade (%)
0
0
Traffic
Lane Average Speed (mph)
35
35
Average Traffic (# Vehicles)
500
Hourly
Daily
500
Hourly
Daily
Cars (% of Total Volume)
90
%
90
%
Medium Trucks (% of Total Volume)
3
%
3
%
Heavy Trucks (% of Total Volume)
7
%
7
%
Receiver Distance from Roadway (ft)
50
Noise Abatement Criteria Activity Category:
*23 CFR Part 772 Table 1
Activity Level A | 57 dB(A)
Activity Level B | 67 dB(A)
Activity Level C | 67 dB(A)
Activity Level D | 52 dB(A)
Activity Level E | 72 dB(A)
Calculate Noise (LAeq, 1
Results
Primary Lane
Noise (LAeq, 1 hour)
dBA
Total Noise (LAeq, 1 hour)
dBA
Opposing Lane
Noise (LAeq, 1 hour)
dBA

TNM Low Volume Tool



	Primary Lane		Opposing Lane
Characteristics			
Pavement Type	Average	Average	Average
Grade (%)	0	0	0
Traffic			
Lane Average Speed (mph)	35	35	35
Average Traffic (# Vehicles)	500 Hourly / Daily	500 Hourly / Daily	500 Hourly / Daily
Cars (% of Total Volume)	90 %	90 %	90 %
Medium Trucks (% of Total Volume)	3 %	3 %	3 %
Heavy Trucks (% of Total Volume)	7 %	7 %	7 %

Receiver Distance from Roadway (ft): 50

Noise Abatement Criteria Activity Category: Activity Level B | 67 dB(A)

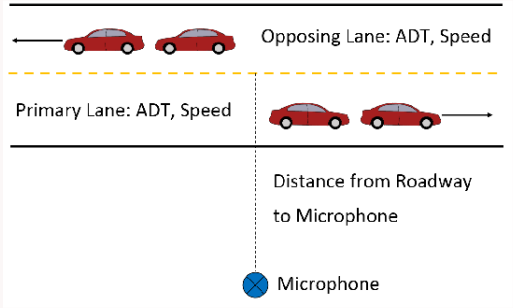
*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

Primary Lane Noise (LAeq, 1 hour)		Opposing Lane Noise (LAeq, 1 hour)
64.3 dBA	Calculated noise level is within 5 dB of the noise abatement criterion. A detailed study is required.	64.3 dBA
	Total Noise (LAeq, 1 hour): 67.3 dBA	

TNM Low Volume Tool



Primary Lane

Opposing Lane

Characteristics

Pavement Type: Average | Average

Grade (%): 0

Traffic

Lane Average Speed (mp

Average Traffic (# Vehi: 500 Hourly Daily | Daily

90 %	Cars (% of Total Volume)	90 %
3 %	Medium Trucks (% of Total Volume)	3 %
7 %	Heavy Trucks (% of Total Volume)	7 %

Speed_error

Cannot calculate noise without speed input

Ok

Receiver Distance from Roadway (ft): 50

Noise Abatement Criteria Activity Category: Activity Level B | 67 dB(A)

*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

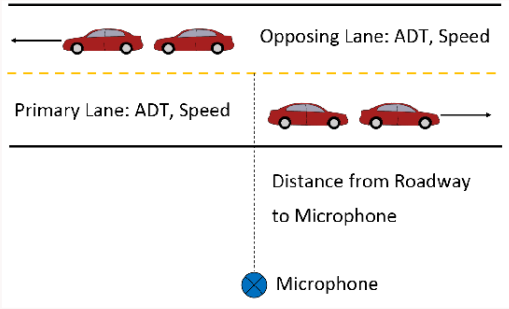
Primary Lane Noise (LAeq, 1 hour): 64.3 dBA

Calculated noise level is within 5 dB of the noise abatement criterion. A detailed study is required.

Total Noise (LAeq, 1 hour): 67.3 dBA

Opposing Lane Noise (LAeq, 1 hour): 64.3 dBA

TNM Low Volume Tool



Primary Lane		Opposing Lane
Characteristics		
Average	Pavement Type	Average
0	Grade (%)	0
Traffic		
35	Lane Average Speed (mph)	35
1000 Hourly Daily	Average Traffic (# Vehicles)	500 Hourly Daily
90 %	Cars (% of Total Volume)	90 %
3 %	Medium Trucks (% of Total Volume)	3 %
7 %	Heavy Trucks (% of Total Volume)	7 %

Receiver Distance from Roadway (ft) 50

Noise Abatement Criteria Activity Category: Activity Level B | 67 dB(A)

*23 CFR Part 772 Table 1

Calculate Noise (LAeq, 1 hour)

Results

Primary Lane Noise (LAeq, 1 hour)		Opposing Lane Noise (LAeq, 1 hour)
67.3 dBA	Calculated noise level is within 5 dB of the noise abatement criterion. A detailed study is required.	64.3 dBA
	Total Noise (LAeq, 1 hour) 69.1 dBA	

Questions?