DOVE MOUNTAIN BOULEVARD TRAFFIC SOUND ASSESSMENT
Companion Handout on Sound and Noise Information
04/17/2024

The following figures help to explain the issues and considerations related to sound and noise assessment. Unless otherwise noted, figures and tables are taken from *FHWA-NHI-142086, Acoustics of Highway Traffic and Construction Noise.*

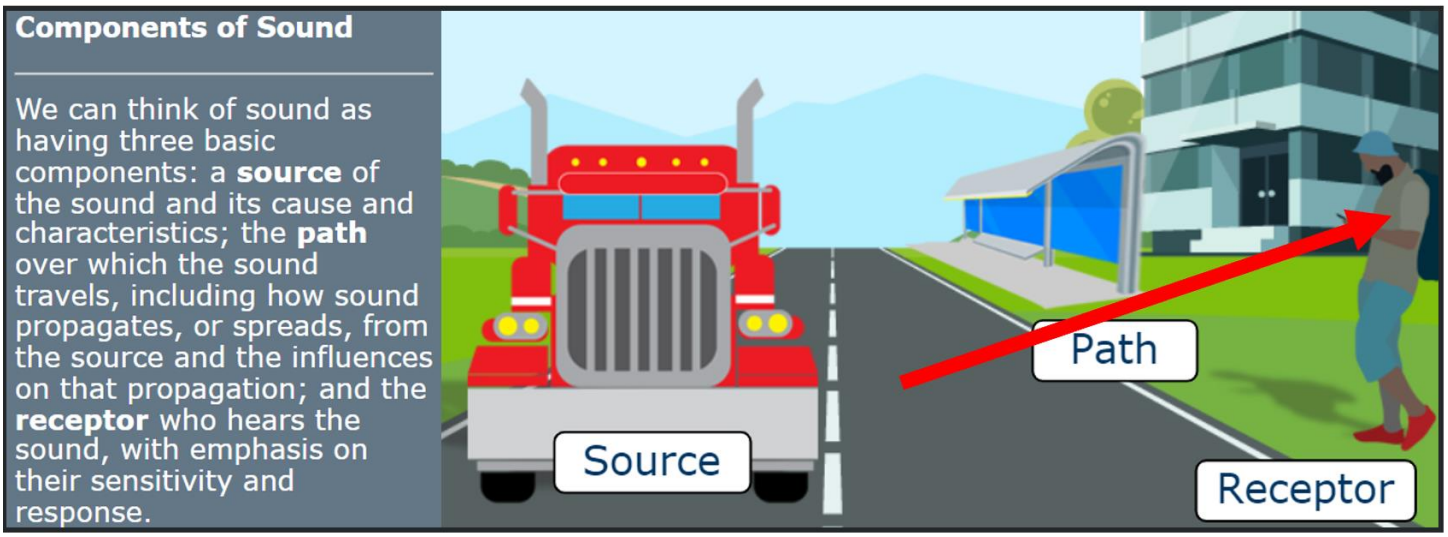


Figure 1 – Components of Sound

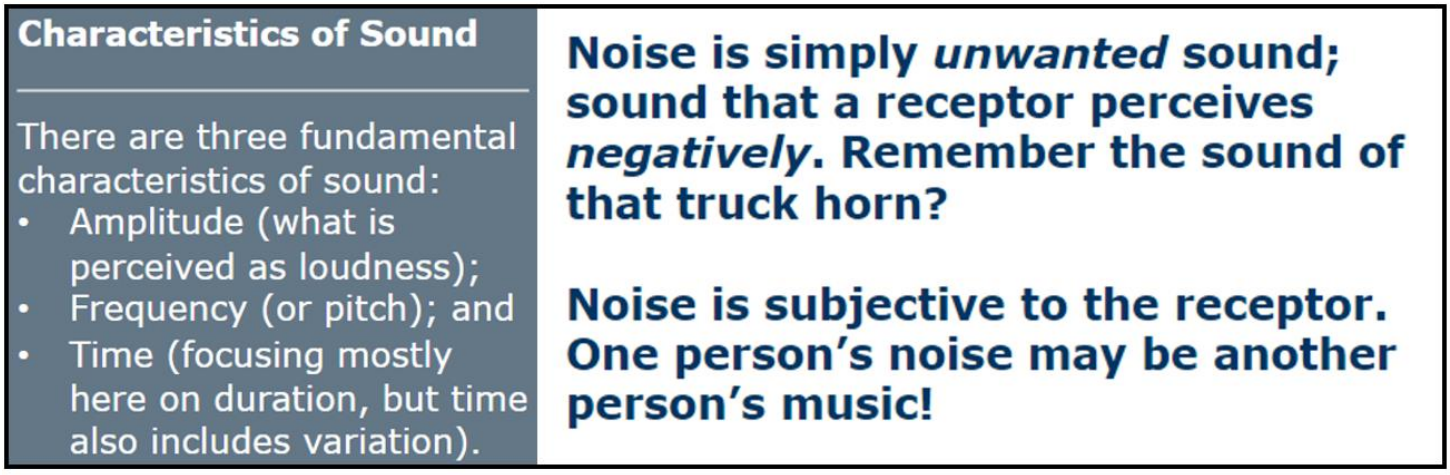


Figure 2 – Characteristics of Sound and Definition of Noise

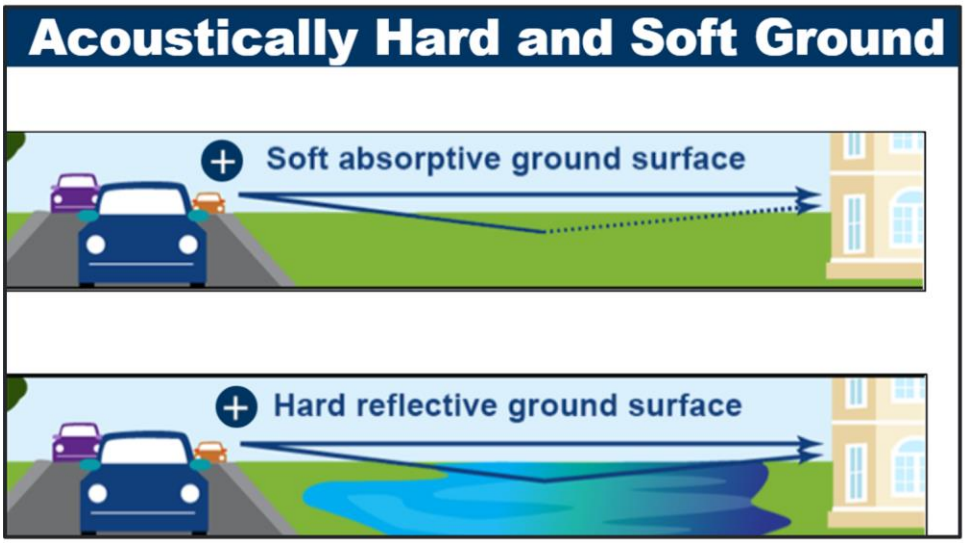
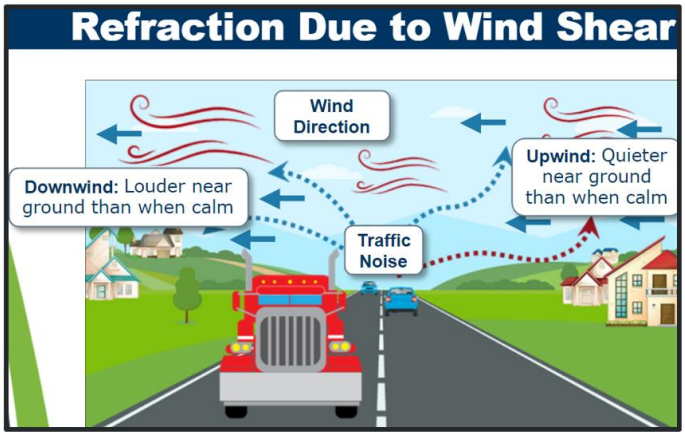


Figure 3 – Characteristics of Ground Surface on Sound



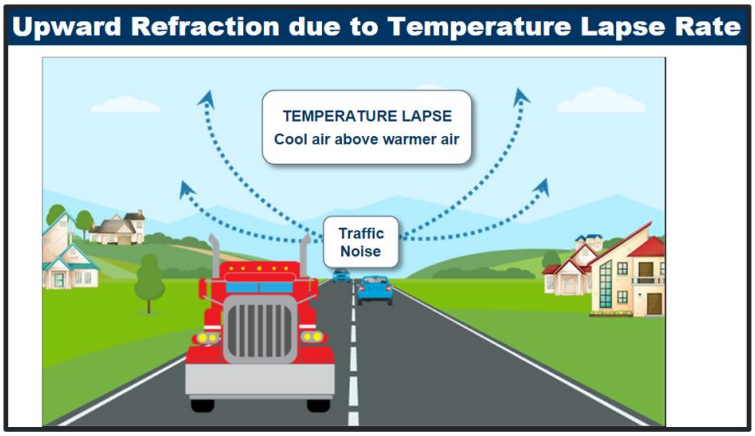
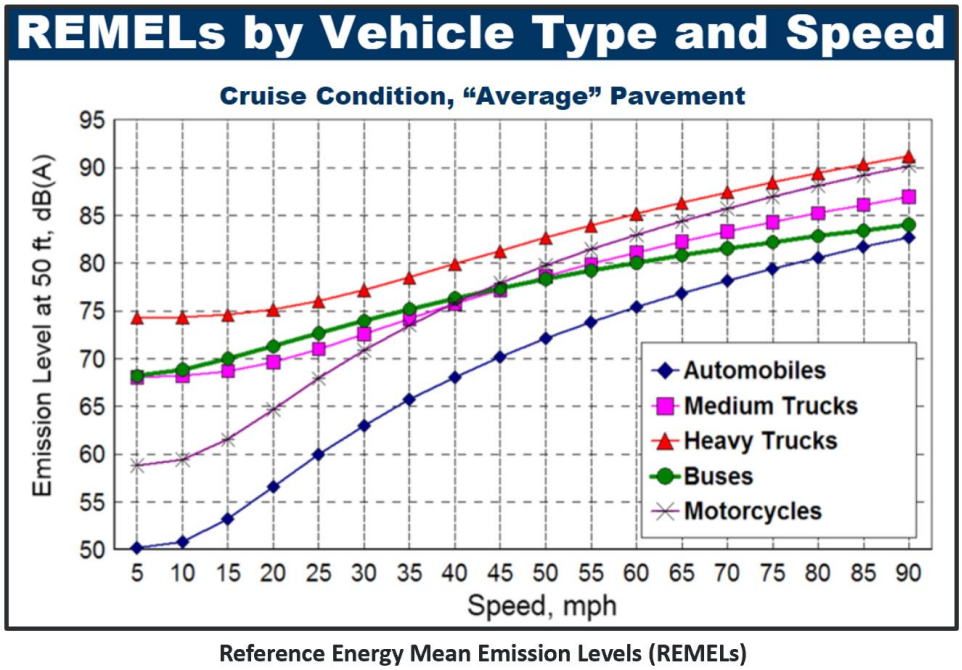


Figure 4 – Weather Impacts on Sound



Reference Energy Mean Emission Levels (REMELs)

Figure 5 – Relation Between Vehicle Type, Speed, and Sound

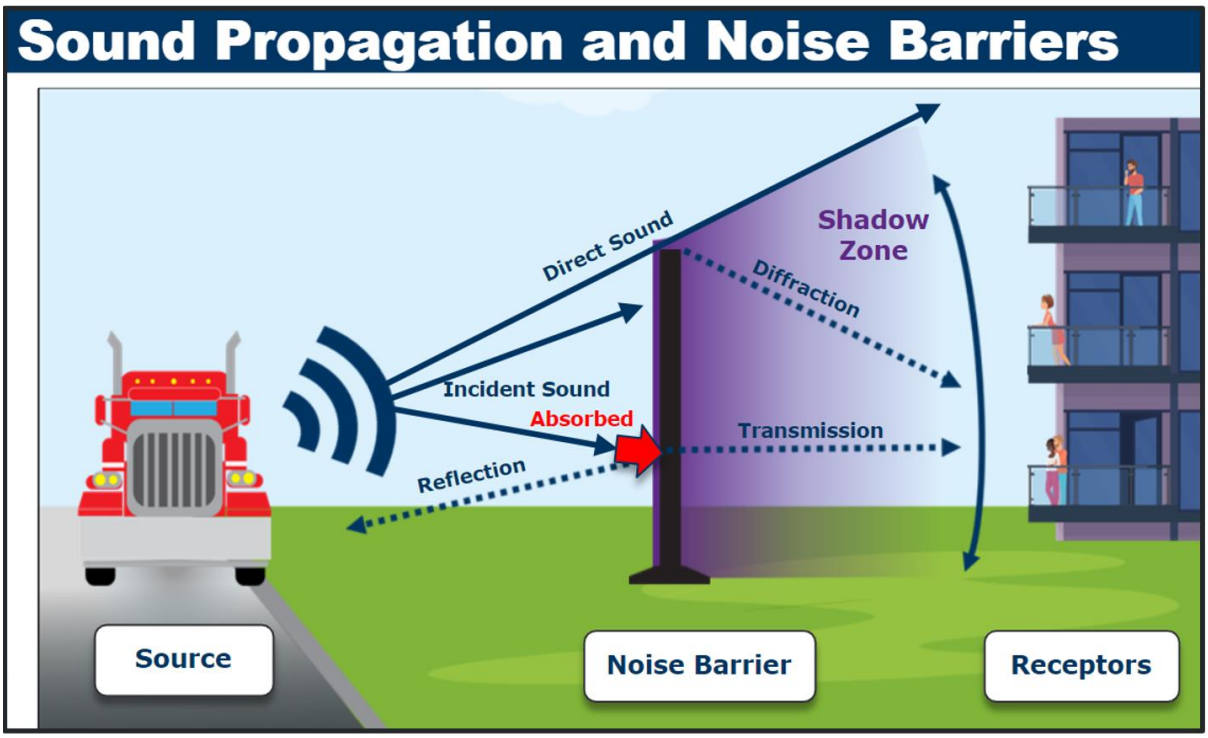
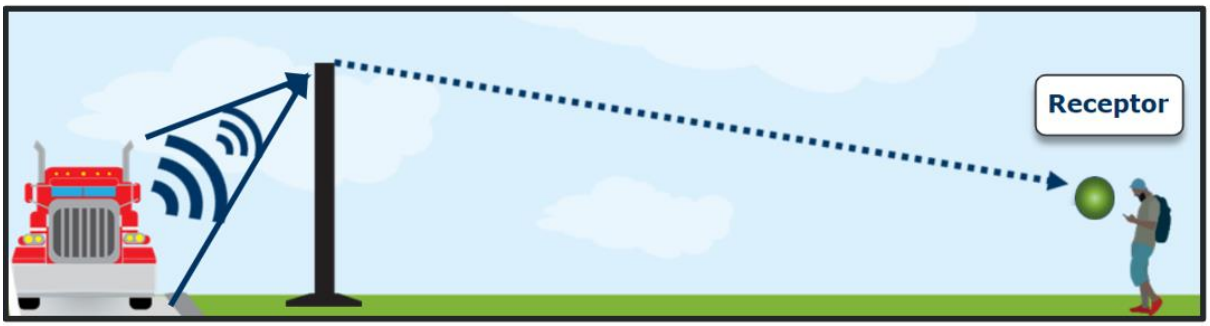
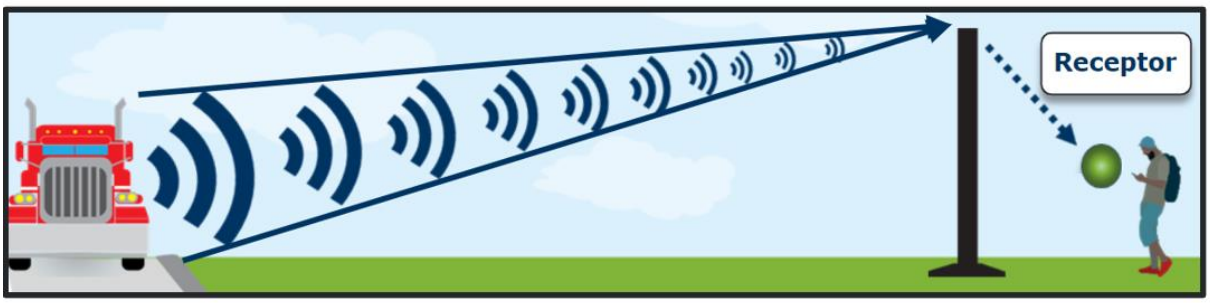


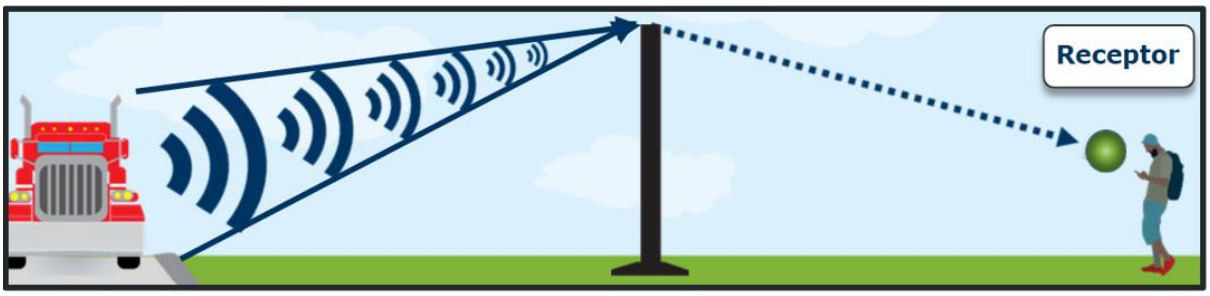
Figure 6 – Sound and Barriers



GOOD



GOOD



BAD

Figure 7 – Effective Location of Barriers

Reflections off a Single Wall

- Barrier or building on one side of roadway can reflect sound energy back across roadway
- Only 1-3 dB increase, yet residents often perceive difference
- Change in sound frequency content may occur

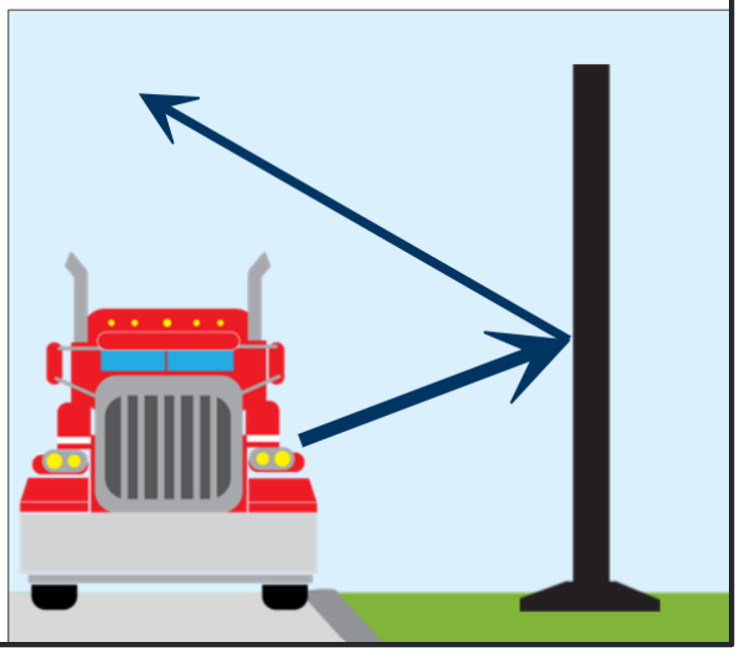


Figure 8 – Issue with a Single Side Barrier

IL: Obtaining Noise Reduction with Barriers

Insertion Loss	Degree of Difficulty	Reduction in Sound Energy	Relative Reduction in Loudness
5 dB	Simple	68%	Readily perceptible
10 dB	Attainable	90%	Half as Loud
15 dB	Very difficult	97%	One-third as loud
20 dB	Nearly impossible	99%	One-fourth as loud

Figure 9 – Insertion Loss Potential and Degree of Difficulty

Transmission Loss of Different Materials

Material	Thickness (inches)	Weight (lb/ft ^{2})	A-weighted TL (dB) *
Concrete Block, 8″ x 8″ x 16″, light weight	8	31	34
Dense Concrete	4	50	40
Light Concrete	4	33	36
Steel, 18 gauge	0.050	2.0	25
Steel, 24 gauge	0.025	1.0	18
Aluminum, Sheet	0.125	1.8	25
Wood, Fir	2 (nominal)	6.7	24
Plywood	1	3.3	23
Glass, Safety	0.125	1.6	22
Acrylic	0.25	1.5	22

*20 or more provides adequate performance as a sound barrier

Figure 10 – Transmission Loss of Different Potential Barrier Materials *(Source: FHWA Noise Barrier Design Handbook)*