Traffic Noise Basics

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MDT Noise Policy

MDT will consider installing noise berms or walls to mitigate traffic noise IF:

- 7-dBA noise reduction can be achieved
- Affected landowners generally support mitigation
- Costs meet a Cost-Effective Index (CEI)
- Can be safely and reasonably built & maintained

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Noise Basics

Noise is generally defined as unwanted sound.

- Perception influenced by:
  - Previous exposure to source
  - Frequency (pitch)
  - Duration
  - Impulsiveness
  - Attitude
  - Visibility
- *Perception varies person to person.*

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Perception of Sound Changes

- A 2- to 3-dBA change is generally the smallest perceivable change.
- A 5-dBA change is readily perceived
- A 10-dBA change is perceived as doubling or halving the sound level.

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Highway Noise

- Sources:
  - Automobiles
  - Buses
  - Motorcycles
  - Medium & Heavy Trucks

- Subsources:
  - Tire Noise
    - Important for autos
    - May be important for trucks
    - Tire-Pavement interaction
  - Exhaust Noise
    - Important for trucks
    - Low-frequency “rumble”

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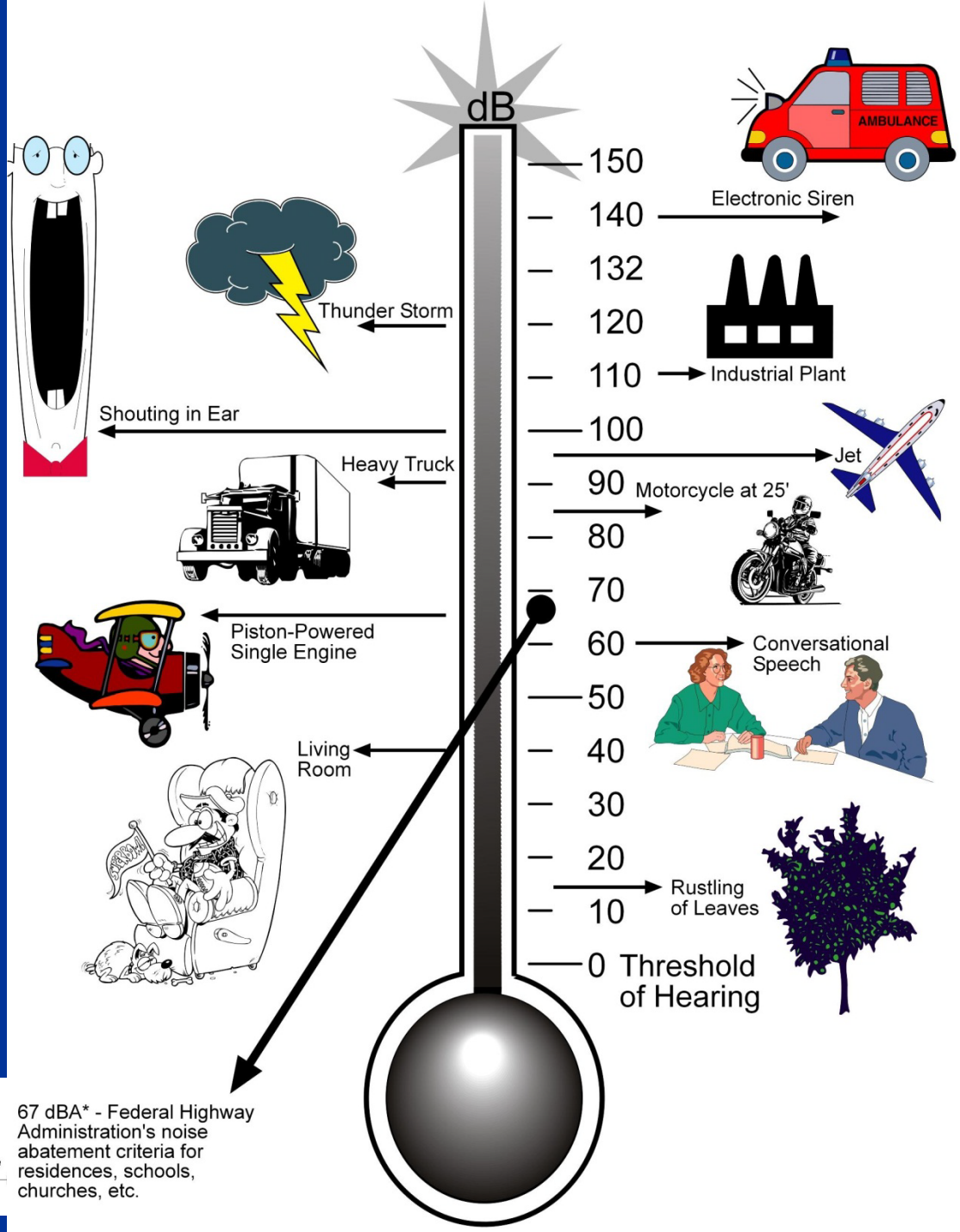
Sound Level Comparisons



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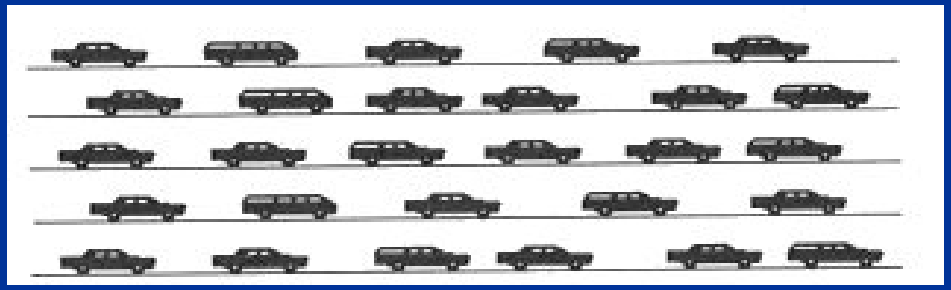
Traffic Noise

- Depends on vehicle mix

One heavy truck at 55 mph sounds as loud as



28 cars at 55 mph

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Traffic Noise

- Depends on vehicle speed
  - Tire/pavement noise dominates above 30 mph

Traffic at 65 mph sounds 2x as loud as

traffic at 30 mph

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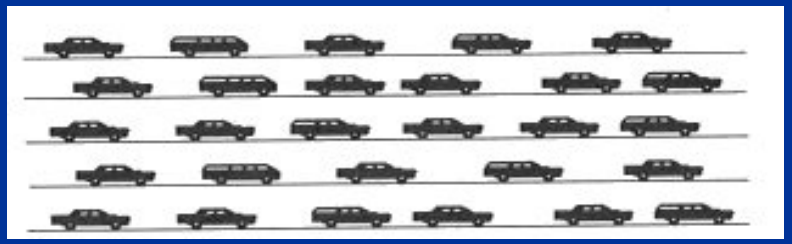
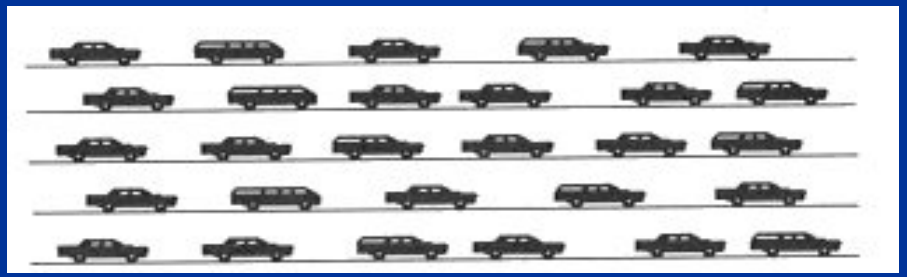
Traffic Noise

- Depends on amount of traffic
  - Double traffic volume = increase noise by 3 dBA



+



= +3 dBA

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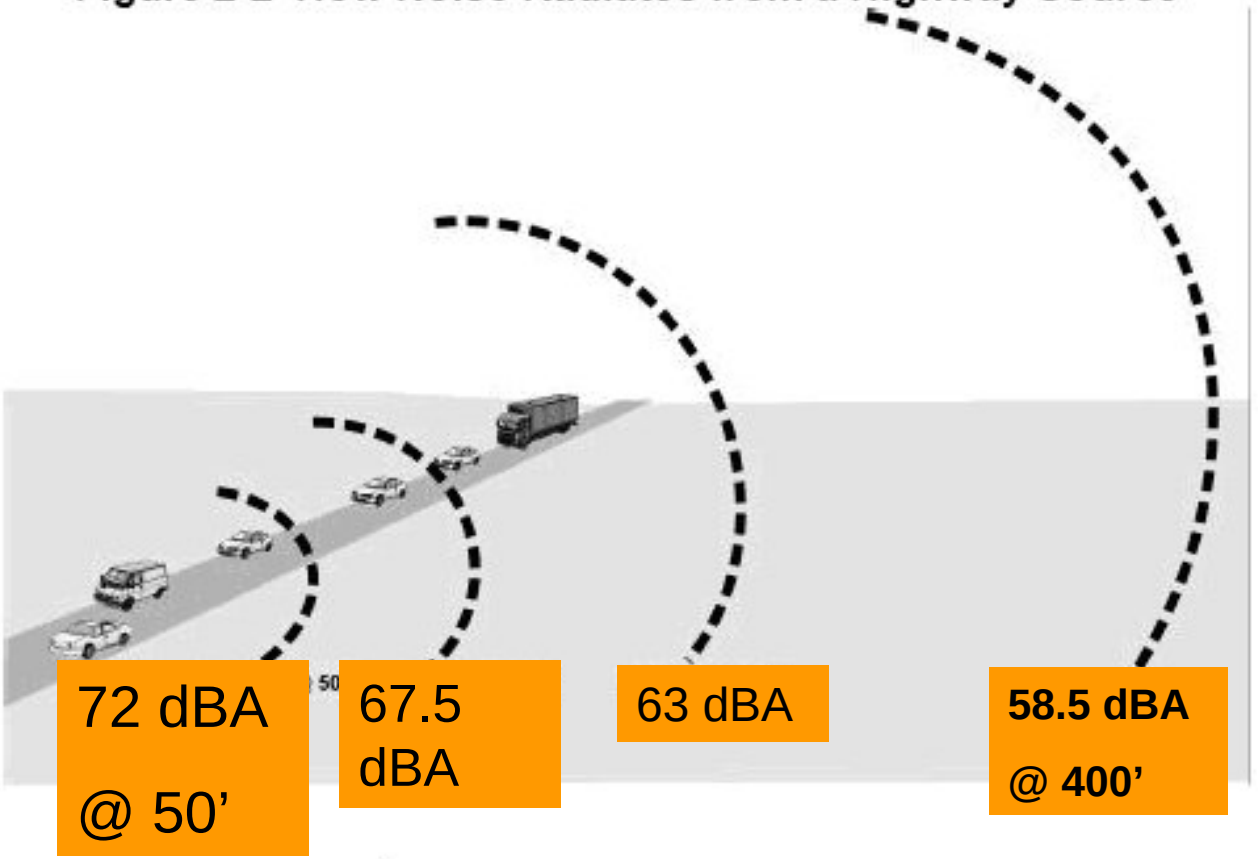
Traffic Noise: Travel Patterns

Figure 2-2 How Noise Radiates from a Highway Source



[6] PENN DOT “Making Sound Decisions About Highway Noise Abatement”, 2002

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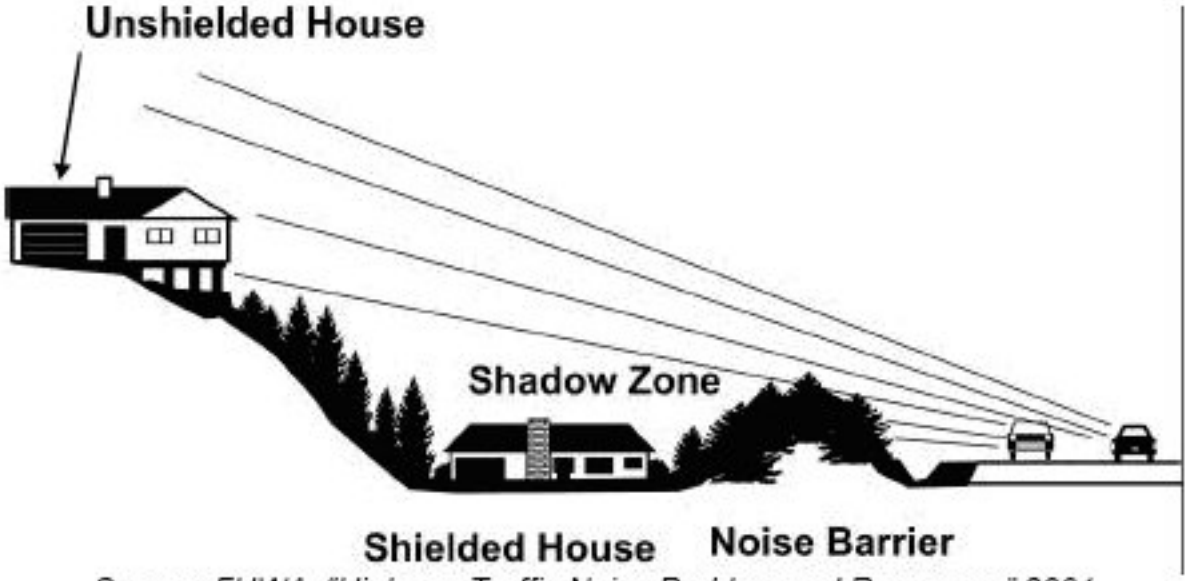
Noise Barriers

- Must block line of sight to vehicles on road
- Will REDUCE traffic noise, not ELIMINATE it



Source: FHWA, "Highway Traffic Noise Problem and Response," 2001.

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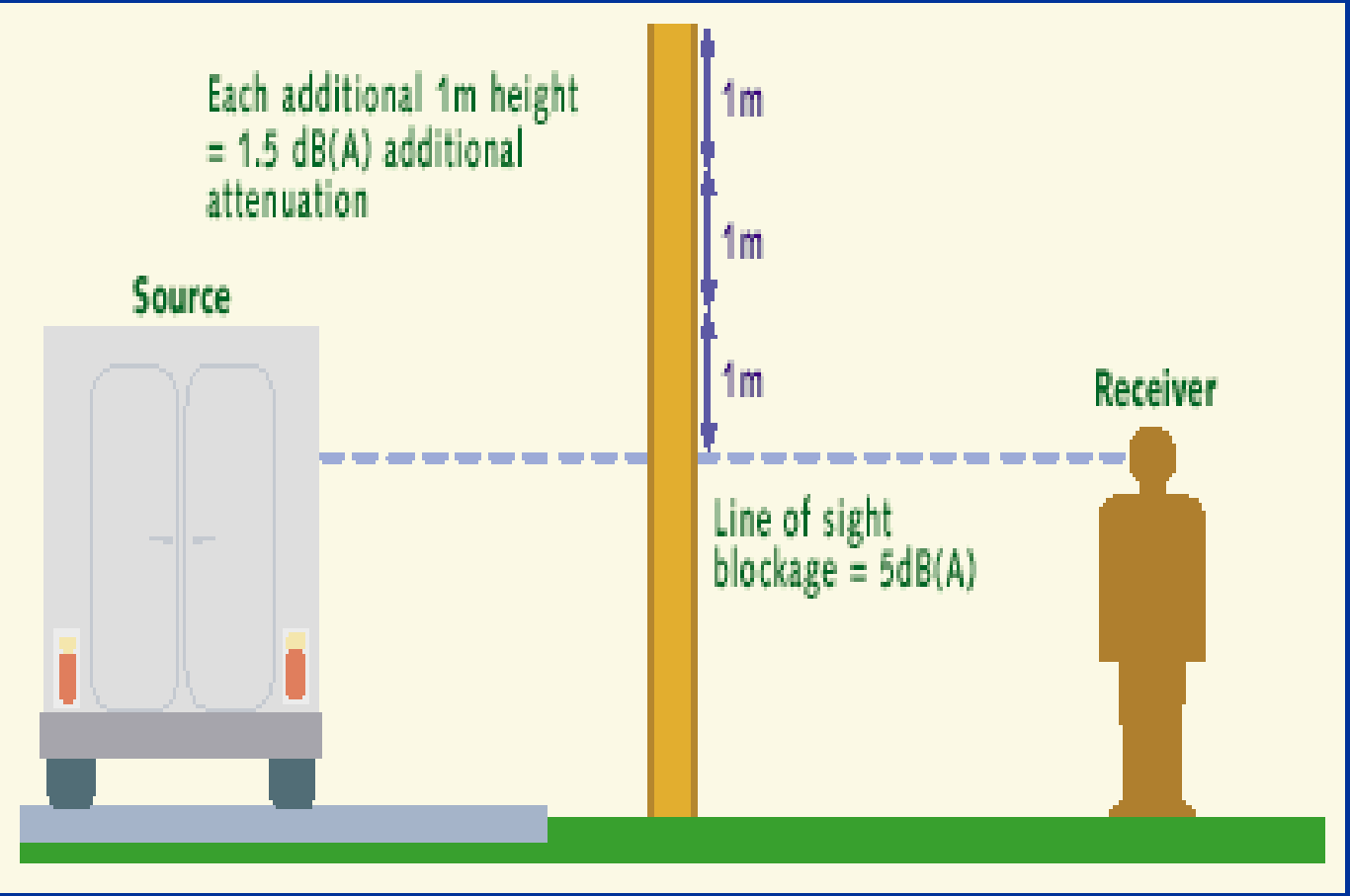
Mitigation - Barriers



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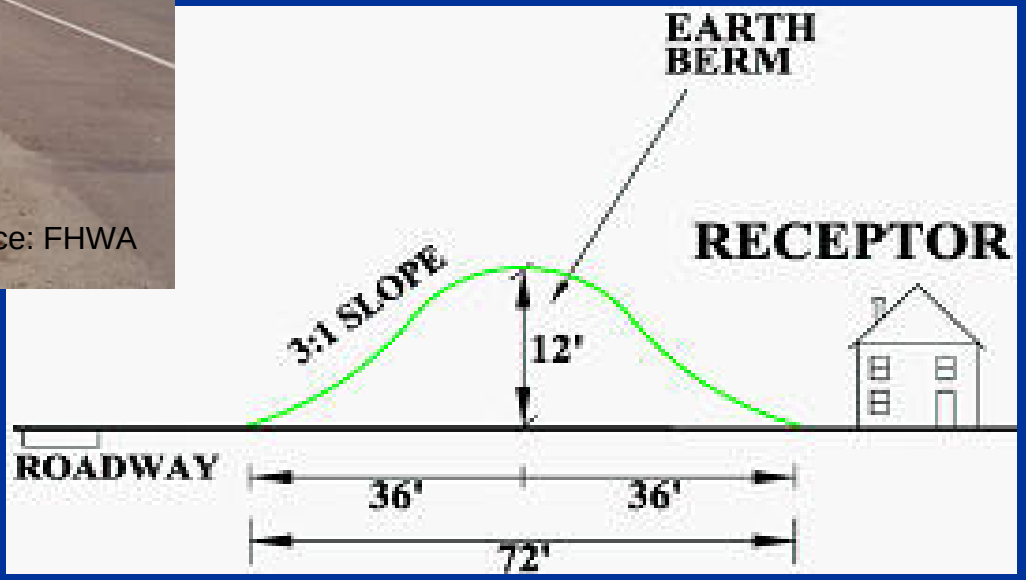
Mitigation - Berms



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Mitigation – Berm / wall

- Combination barrier: wall on top of berm


Source: FHWA


Source: FHWA

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Mitigation – Wall

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Noise Barriers

- **REDUCE Noise, do not ELIMINATE Noise**

- Feasibility – safety, engineering factors, effectiveness of wall
- Reasonableness - overall benefits of abatement, public input.
- Mitigation cannot protect 2nd floor
- Decision to provide noise abatement made ONCE.

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Downsides to Barriers

- Block view
- Sun may reflect heat (difficult growing conditions)
- May cause excessive shadowing or block breezes

More Information:

- Website: http://www.kalispellbypass.com/environmental.cfm
  - Additional Files on website showing sample Noise Walls and renderings (computer generated versions of the Bypass Noise Walls)
- MDT: website http://www.mdt.mt.gov/business/contracting/environmental/air_noise.shtml

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