



# **Wisconsin Department of Transportation**

## **Highway Noise Barriers – Frequently Asked Questions**

**May 2012**

### **Q. Why does the Wisconsin Department of Transportation (WisDOT) build noise barriers?**

**A.** The Federal noise regulation at 23 CFR 772 establishes the requirement for State Highway Agencies to determine noise impacts and evaluate possible mitigation measures as part of a proposed Type I Federal Aid project.

### **Q. What is a Type I project?**

**A.** A Type I project is defined as:

- the construction of a highway on new location; or,
- the physical alteration of an existing highway (that substantially changes either the horizontal or the vertical alignment); or,
- the addition of a through traffic lane(s) or auxiliary lane (that is not a turn lane); or,
- the addition or relocation of an interchange lane(s) or ramp(s) added to a quadrant to complete an existing partial interchange; or,
- restriping existing pavement to add a through lane or the addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.

### **Q. How does WisDOT determine where to place noise barriers?**

**A.** The Traffic Noise Model (TNM 2.5) is used to predict design year (usually twenty years in the future) traffic sound levels. Impacted receptor locations are then considered for noise abatement. First, project staff evaluate potential design and traffic control modifications, such as prohibiting trucks or changing the horizontal or vertical alignment. Then, noise barriers (walls or berms) are modeled for attenuating noise and is optimized to ensure the beneficial and economic wall is designed. A determination is then made whether or not each barrier is a reasonable and feasible mitigation measure.

### **Q. What is an impacted receptor?**

**A.** A receptor (listener) or common use area (an outdoor place in a multi-unit residential complex where frequent human use by all complex residents occurs and a lowered noise level would be of benefit) that has a predicted future traffic sound level that approaches or exceeds the WisDOT Noise Level Criteria (NLC) for Considering Barriers for different land use categories, or when predicted future sound levels exceed existing levels by 15 decibels (dB) or more. NLC is divided into land use categories that include residential areas, serene/quiet lands, parks, schools, hotels, offices, etc.

### **Q. What does reasonable and feasible mean?**

**A.** For a noise barrier to be reasonable, the total cost may not exceed \$30,000 per benefited receptor. To be considered a benefit, an impacted receptor must receive a minimum of eight (8) dB noise reduction. For a noise abatement measure to be feasible, a minimum of one (1) impacted receptor or common use area shall achieve a five (5) decibel noise reduction.

### **Q. How is the height of the barrier determined?**

**A.** Noise barriers are designed to provide a minimum of eight (8) dB reduction in average background traffic noise for the majority of residences located directly behind the barrier (first row), and a nine (9) dB reduction for at least one impacted location. Computer models will determine the height of barrier needed to provide noise reduction.

**Q. Why not plant trees instead of putting up a wall?**

**A.** Trees provide a visual shield and some psychological benefit, but are not nearly as effective at reducing noise levels as a solid barrier. It would take at least 100 feet of dense vegetation to provide five (5) decibel reduction.

**Q. How effective are noise barriers?**

**A.** Effectiveness is dependent on the distance between the receptor and the barrier. For receptors located directly behind a barrier providing an eight (8) decibel reduction, the perceived noise level will be cut in half. This benefit decreases as a listener moves farther away from the barrier and is negligible at distances greater than 500 feet.

**Q. How much do noise barriers cost?**

**A.** Current construction costs are averaging \$26 per square foot. The typical height required for an eight (8) dB reduction is 16 feet – considering the receptor and roadway elevation are equal heights. With these figures, a barrier would cost \$2.2 million per mile per side of road.

**Q. Who pays for noise barriers?**

**A.** Federal and state highway money is used for the construction of noise barriers.

**Q. What types of barriers are there?**

**A.** Noise barriers are typically made of pre-cast, composite sound-absorptive panels that can have different texture looks and color (i.e., stone, brick, smooth or grooved patterns).

**Q. Does the public have any input?**

**A.** Noise barriers that are determined to be reasonable and feasible must receive a vote of support from a simple majority of all votes cast by the owners and residents of the benefited receptors (noise level would be reduced by at least eight (8) dB) as follows:

- For each benefited receptor that is an owner-occupied residence, the owner shall have one vote.
- For each benefited receptor that is not an owner-occupied residence, the owner shall have one vote and one resident shall have one vote.

A public information meeting is held in conjunction with the balloting process in order to provide owners or residents of the benefited receptors an opportunity to ask questions.

**Q. Who is responsible for noise barrier maintenance?**

**A.** WisDOT is responsible for maintenance on both sides of the noise barrier.