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Noise Barriers: What You Should Know

U.S. Department of Transportation
Federal Highway Administration

Improving a Gateway to Wisconsin

At the start of a state highway project, the Wisconsin Department of Transportation (WisDOT) determines noise impacts and evaluates possible mitigation measures, such as noise barriers.

After careful evaluation and a voting process, WisDOT installs noise barriers along portions of state highways to minimize noise impacts.

Enclosed are frequently asked questions about noise barriers and their answers. This will help you understand WisDOT policy for installing noise barriers and how adjacent landowners and residents are involved.

View of Noise barrier from the residential side.

What do noise barriers look like?

Here's a sampling of noise barriers constructed in Wisconsin.

I-39/90/94 at Cottage Grove Road near Madison.

I-39/90/94 at Buckeye Road near Madison.

FAQs

Q. Why does WisDOT build noise barriers?
A. It is part of a federal requirement. U.S. noise regulation (23 CFR 772) requires 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. Type I projects include:

- The construction of a highway on a new location;
- The physical alteration of an existing highway (that substantially changes either the horizontal or the vertical alignment);
- The addition of a through traffic lane(s) or auxiliary lane (that is not a turn lane);
- The addition or relocation of an interchange lane(s) or ramp(s) added to a quadrant to complete an existing partial interchange;
- 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.

I-39/90/94 at Buckeye Road near Madison.

Q. How does WisDOT determine where to place noise barriers?
A. The Traffic Noise Model (TNM 2.5)® is used to predict future traffic sound levels. Impacted locations are then considered for noise abatement measures. Project staff evaluates potential design and traffic control modifications, such as prohibiting trucks or changing the horizontal or vertical alignment. Then, noise barriers are modeled for attenuating noise and are optimized to ensure a beneficial and economical barrier is designed. After the evaluation, a determination is made whether each barrier is a feasible and reasonable mitigation measure.

I-39/90/94 at Buckeye Road near Madison.

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 colors (e.g., stone, brick, smooth or grooved patterns).

Q. What is an impacted receptor?
A. An impacted receptor/listener or common use area is one with:

- A predicted future traffic sound level which approaches or exceeds the WisDOT Noise Level Criteria (NLC) for Considering Barriers for different land use categories;
- Or when predicted future traffic sound levels exceed existing levels by fifteen (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 feasible and reasonable mean?
A. For a noise abatement measure to be feasible, a minimum of one impacted receptor or common use area must achieve a five (5) decibel noise reduction. 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.

Q. Who is responsible for noise barrier maintenance?
A. WisDOT is responsible for maintenance.

Q How is the barrier height 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 and a nine (9) dB reduction for at least one impacted location. Computer models determine the height of the barrier needed to provide noise reduction.

Q. How effective are noise barriers?
A. Effectiveness depends on the distance between the impacted receptor and the barrier. For areas located directly behind a barrier providing an eight (8) dB reduction, the noise level will be perceived and being 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 barrier costs average $26 per square foot. The typical height required for an eight (8) dB reduction is 16 feet. 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. Does the public have any input?
A. Yes. 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 adjacent landowners and residents of the benefited areas. A public information meeting will be conducted in order to provide adjacent landowners and residents of the benefited areas an opportunity to ask questions and learn about the voting process.