Traffic Noise

Growth has brought great demands on North Carolina's highway system, and the N.C. Department of Transportation is working to keep pace by continuously improving and expanding roads, bridges and freeways.

One of NCDOT's goals when it comes to road projects is ensuring that they are compatible with the surrounding environment. Part of that includes examining how traffic noise – an inevitable byproduct of highways and their construction – might have an impact on homes, schools, churches and other places where people might be affected.

Reducing Traffic Noise

NCDOT's efforts to reduce unwanted sound involve highly qualified analysts who use the latest state-of-the-art computer models and noise measurement equipment to predict how future traffic noise might affect an area.

Noise reduction measures, such as noise walls, are considered when the sound level is predicted to be more than 66 decibels – about the level of noise from a vacuum cleaner from about 10 feet away or a riding lawn mower from 100 feet away. Noise at this level begins to disrupt normal speaking volumes for most people.

NCDOT also considers abatement measures when predicted noise levels exceed existing levels by 10 decibels or more.

When effective, noise walls can decrease noise levels by 5 to 10 decibels, reducing the perceived loudness of traffic noise by as much as half. A barrier that provides a 10-decibel reduction, for example, can reduce the pass-by sound level of a typical tractor-trailer to that of a car.

In addition to abatement devices, NCDOT also assists local governments in developing noise-compatible land-use guidelines so traffic noise is not as severe a problem with future development along roadways.

NCDOT actively looks for ways to increase the options available for reducing traffic noise in areas where noise walls are not feasible.

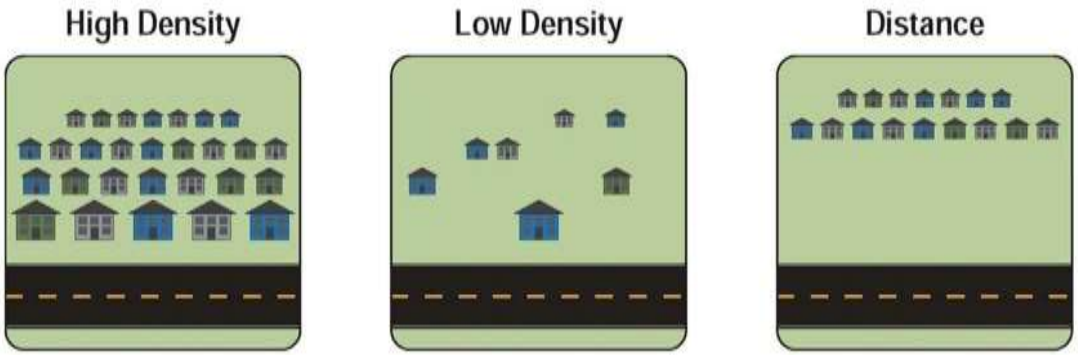
Noise Walls

Most noise barriers in North Carolina are made of concrete or masonry, which are durable, require little maintenance and can be designed for aesthetics. (Municipal governments can provide funding for additional enhancements.)

NCDOT examines several factors when determining if a noise wall would be an effective way to reduce the noise level. These considerations involve answering several very important questions, including:

- **How many people will hear a difference in noise?** Does the number of people justify the cost of a noise wall? Sometimes, the state just cannot afford to build a wall because the cost outweighs the benefit.
- **Will a noise wall reduce the anticipated noise level?** A noise wall might not always decrease the noise level enough to justify its construction.
- **Is a noise wall technically realistic?** Every road is different – sometimes the terrain makes building a noise wall very difficult or too costly.
- **Does the majority of adjoining property owners want a noise wall?** Commercial areas typically prefer visibility and accessibility over noise reduction. In other cases, an adjacent property owner might prefer the existing view over having a noise wall in his or her yard.
- **Are any alternatives to noise walls possible?** Soil berms or highway design changes might help reduce the noise level.

Likelihood of Qualifying for a Noise Wall



A noise wall would more likely be built in **an area of high-density development** than in **an area of low-density development** since it could reduce the noise level for many houses. A low-density area would be less likely to get a wall because its cost would outweigh the number of people who would benefit from it.

Distance is another factor NCDOT considers when determining where to build noise walls. An area farther from a road – even if it is heavily populated – would be less likely to qualify since a wall would have a minimal effect on the noise level.

Earth Berms

Earth berms are a low-cost, aesthetically pleasing alternative to noise walls that not only have the advantage of blending in with the surrounding environment but also provide slightly more noise reduction than walls.

But berms require a large amount of soil and also need a lot of available land. For example, a berm 10 feet tall must be over 60 feet wide. Most highway projects – especially in urban areas – don't have that amount of space available and buying additional right of way is expensive.

Vegetation and Landscaping

Vegetation and landscaping are not acceptable means of noise reduction and generally do not provide adequate support for reducing traffic noise levels. Vegetation must be very dense, very tall and very deep to make a difference. Generally, it takes at least 100 feet of depth to get a 5-decibel reduction. In highly populated areas, such thick vegetation is rare.

Although vegetation does not really reduce noise levels, it can "soften" the harsh tones of traffic noise as well as improve aesthetics by screening or hiding a road. After construction, NCDOT might provide landscaping to provide a visual buffer along the highway corridor.

Before Landscaping

Projected View 10 Years After Landscaping

Before Landscaping

Projected View 10 Years After Landscaping

Rules and Regulations

NCDOT ensures that all federal and state regulations, policies and guidance regarding traffic noise are followed during the planning and design stages of highways construction projects.

Federal Regulations and Guidance

The Federal Highway Administration's regulations and guidance require that NCDOT:

- Identify the impact of traffic noise on all nearby developed land uses
- Examine potential noise reduction measures
- Incorporate all feasible and reasonable noise reduction measures into the highway project

- Coordinate with local governments to provide pertinent information on noise-compatible land use planning and control

Federal noise regulations also contain criteria for analyzing traffic noise and determining the upper limit of acceptable highway traffic noise levels for different types of land uses and human activities.

The regulations do not require providing noise reduction in every instance, but they do require highway agencies to make every feasible and reasonable effort to provide reduced noise levels when the acceptance threshold noise levels are approached or exceeded.

Compliance with the federal noise regulations is a prerequisite for receiving federal-aid funds for highway construction.

North Carolina Traffic Noise Abatement Policy

NCDOT's Traffic Noise Abatement Policy, which was approved by the Federal Highway Administration, describes the process used to determine the impact of traffic noise and noise reduction measures as well as using public funds for these measures. NCDOT's policy on highway traffic noise describes the implementation of the federal traffic noise requirements as they relate to federal and state funded highway construction in North Carolina.

The NCDOT Traffic Noise Analysis and Abatement Manual is a companion document to the Traffic Noise Abatement Policy. Its purpose is to assist NCDOT employees, private consulting firms, local governments and developers with the evaluation of traffic and construction noise and the development of appropriate noise reduction measures.

For More Information

NCDOT is committed to providing traffic noise information and assistance to any local government, community group, professional organization or other entity that requests such assistance. Questions regarding traffic noise or regulations and policies related to traffic noise should be directed to:

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