



# Noise Barriers Fact Sheet

Noise is defined as unwanted sound and can come from man-made and natural sources. Sound levels are measured in decibels (dB) and typically range from 40 to 100 dB.

A 3 dB increase can barely be detected.

A 5 dB increase is clearly detectable.

A 10 dB increase is twice as loud as the starting noise level.

Because human hearing is limited in detecting very high and low frequencies, "A-weighting" is commonly applied to sound levels to better characterize their effects on humans. A-weighted sound levels are expressed as dBA.

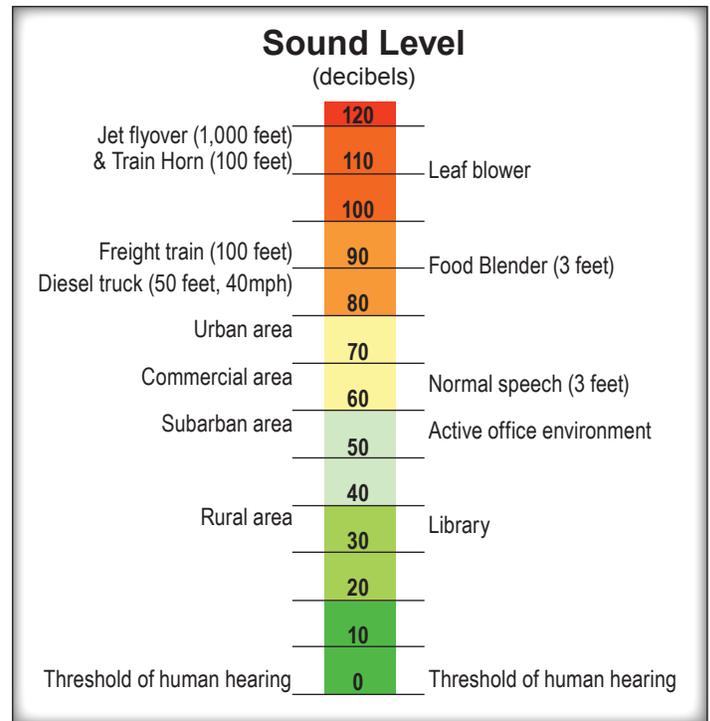
Because noise in our daily environment varies over time, and sustained noise levels (such as a nearby highway) interfere with our daily activities to a greater extent than short, louder noises (such as a single car horn), traffic noise analyses typically consider average noise levels over a one-hour period.

## Who Regulates Highway Noise? How Is an Impact Determined?

The Federal Highway Administration (FHWA) has developed regulations regarding noise analysis on federally funded highway projects, and INDOT has outlined its implementation guidance in its Traffic Noise Policy.

The policy establishes two criteria for identifying an impact resulting from a project:

- 1) Ascertaining where future predicted noise levels would approach or exceed a set of Noise Abatement Criteria (NAC) established in the FHWA regulations. For outdoor uses in residential areas, the NAC is 67 dBA; INDOT defines "approaching the NAC" as within 1 dB (i.e., 66 dBA for residential areas). Therefore, locations where future noise levels are predicted to be 66 dBA or higher are considered "impacted."
- 2) Ascertaining locations where noise levels are expected to increase by 15 dBA or more over existing levels.



## What Causes Traffic Noise?

The level of highway traffic noise depends on three factors:

- Volume of traffic
- Speed of traffic
- Number of multi-axle vehicles

As any of these factors increase, noise levels increase. Traffic noise can also be increased by defective mufflers and steep inclines that require truck engines to labor. Traffic noise can be decreased by distance, terrain, vegetation, or man-made obstacles.

## How Are Future Noise Levels Predicted?

The FHWA Traffic Noise Model (TNM) measures traffic noise factors to generate a 3-D model that can predict noise levels during the noisiest hour of the day. Based on noise levels predicted with and without a proposed project, the model identifies where impacts occur and mitigation should be considered.



## How Can Noise Impacts Be Mitigated?

Traffic noise impacts can be potentially reduced by modifying either the source of the noise (speed, volume or type of vehicles on the highway), the location of the receiver (the person who hears the noise), or the path by which the noise reaches the receiver. Because it is impractical to reduce the speed, volume or type of vehicles on a highway, or to relocate residences solely due to noise impacts, the most common approach to mitigating noise is the construction of noise barriers, also called noise walls.

## How Does INDOT Determine if Barriers Should Be Built?

A noise barrier is proposed when a noise impact occurs and a noise barrier is considered to be feasible and reasonable. A noise barrier is determined to be feasible if it achieves at least a 7 dBA reduction in traffic noise for the impacted areas nearest the source. A barrier must also be reasonable, meaning the barrier must meet INDOT's cost-benefit analysis and is wanted by landowners.

## Who Maintains Noise Barriers?

INDOT constructs noise barriers only on INDOT property and is responsible for maintaining them.

## What Do Noise Barriers Look Like?

Noise barriers typically consist of concrete panels placed between steel supports. The height and location of a wall is determined by the TNM analysis. However, the color and texture of a wall can vary, and INDOT seeks the input of adjacent property owners.



CUSTOM ROCK ASHLAR    FLAT ASHLAR PATTERN    DRY STACK STONE    INDIANA ASHLAR STONE

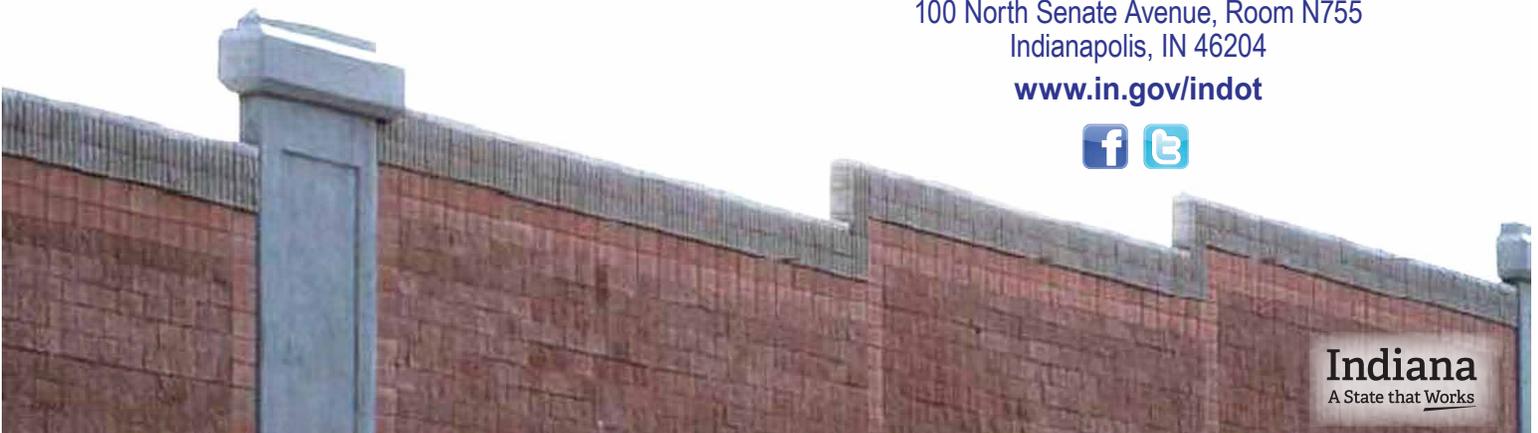
## What if I Don't Want a Noise Barrier?

While owners of residential property generally support construction of barriers, some commercial property owners may prefer to not have a barrier constructed adjacent to their property. For example, a business that relies on visibility from the highway to attract customers may prefer that a barrier not be built, despite the reduction of noise on their property. Prior to approving construction of noise barriers, INDOT surveys affected property owners to gauge their interest, and a majority of those owners must support construction of a barrier for it to be considered.

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