



# TRAFFIC NOISE

## TRAFFIC NOISE PROGRAM

"The Florida Department of Transportation District Four is committed to providing traffic noise abatement where it is feasible and reasonable."

## ABOUT TRAFFIC NOISE

Highway traffic noise has become an increasing concern for the public as well as transportation agencies. The purpose of this brochure is to explain the process used by the Florida Department of Transportation (FDOT) to address highway traffic noise.

## SOUND VS. NOISE

Sound is created when an object moves. The movement causes vibrations and when those vibrations reach our ears, we hear sound. Noise is unwanted sound and is perceived differently by each person.

Sound and noise are quantified in units called decibels (dB). The decibel scale is based on how the human ear interprets sound. For highway traffic noise, an adjustment, or weighting of the high- and low-pitched sounds is made to approximate the way that an average person hears sound, which is called the A-weighted frequency scale (dBA).

## WHAT AFFECTS NOISE?

The level of highway traffic noise depends primarily on these elements: 1) the volume of traffic; 2) the speed of the traffic; and 3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. For example:



2,000 vehicles per hour sound twice as loud as



200 vehicles per hour



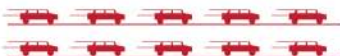
Traffic at 65 miles per hour sounds twice as loud as



traffic at 30 miles per hour



One truck traveling at 55 miles per hour sounds as loud as



10 cars traveling at 55 miles per hour

## WHEN IS NOISE ASSESSED?

FDOT normally assesses traffic noise when one or more of the following conditions is anticipated:

- A new roadway is proposed
- New through lanes are proposed on an existing roadway
- An existing roadway alignment is to be significantly altered

When one or more of these conditions occur, FDOT conducts a traffic noise study in order to quantify the noise levels at noise-sensitive land use sites and investigate the need for noise abatement.



Examples of noise-sensitive land use sites (receivers) are residences, schools and parks. A Noise Study Report is prepared to document the findings of the study and make recommendations regarding noise abatement measures (i.e. noise walls, earth mounds or “berms”, etc.)

These studies are conducted during the initial phase of a roadway project. During the course of the project, the findings are reevaluated to verify any abatement recommendations.



## HOW IS NOISE ASSESSED?

FDOT follows the Federal Highway Administration (FHWA) traffic noise impact criteria in order to determine whether or not noise abatement must be considered. In order to qualify for abatement consideration, a noise-sensitive receiver must meet one of the following criteria:

- Have a projected future exterior traffic noise level that approaches or exceeds the FHWA abatement criteria of 67 decibels
- Have a substantial increase in future traffic noise levels over existing levels, defined as a 15 decibels or greater increase



## REDUCING NOISE

In Florida, noise reduction is usually achieved by the use of noise barriers. Barriers can be made of numerous materials, but normally a concrete wall is constructed on the public right of way between the noise source and the receivers. Other measures such as land use planning can be very beneficial, however, these methods are typically under local control.



# IS IT FEASIBLE ... AND REASONABLE?

When a noise impact is identified, abatement must be considered. The decision of whether or not to provide noise abatement is made by considering several factors of feasibility and reasonableness. Some of the factors that are considered as part of the abatement decision making process are:

- Insertion loss: the traffic noise level reduction as a result of abatement
- Safety: adequate safety standards must be maintained
- Desire of the affected property owners: a survey of the benefited landowners is made to determine whether abatement is desired
- Land use stability: the likelihood that the site will remain a noise-sensitive land use in the future
- Noise level increase: the magnitude of noise level increases in the future
- Antiquity: what was there first, the noise-sensitive site or the roadway
- Constructability: can the noise barrier be constructed using common techniques
- Cost: a cost per benefited receiver which is considered reasonable



# COMPARATIVE NOISE LEVELS

ACTIVITY	DECIBELS
Rustling Leaves	20
Room in Quiet Dwelling at Midnight	32
Window Air Conditioner	55
Conversational Speech	60
Busy Restaurant	65
Vacuum Cleaner in Private Residence (at 10 feet)	69
Loudly Reproduced Orchestral Music in Large Room	82
Heavy City Traffic	92
Home Lawn Mower	98
Air Hammer	107
Jet Airliner (500 feet overhead)	115

Source: Aviation Noise Effects Report No. FAA-EE-85-2



## FREQUENTLY ASKED QUESTIONS

### **Q: Will noise barriers affect my view?**

A: Depending on the exact location of your property, and the location and height of the barrier, it may provide shade and block your current view, as well as access and wind.

### **Q: How tall will the barrier be?**

A: In Florida, barriers are typically 12 to 14 feet tall. However, they can be as short as 8 feet and as tall as 22 feet. The noise study process is designed to determine the most effective barrier height to reduce noise and minimize construction cost.

### **Q: Are barriers required by Federal, FDOT, and / or City Agencies and can they be omitted?**

A: According to State and Federal requirements, noise abatement must be considered if existing and / or projected future noise levels approach or exceed the Federal Highway Administration (FHWA) abatement criteria or a substantial increase is expected. Unless abatement is determined to be not cost reasonable or feasible, it will normally be constructed.

### **Q: How does my area qualify for a barrier?**

A: Traffic noise studies are conducted when one or more of the following conditions occur: 1) an existing roadway is expanded with through lanes; 2) an existing roadway alignment is significantly altered; or 3) a new roadway is proposed. The decision of whether or not to provide abatement is made using the criteria described above.

### **Q: Can I / we petition FDOT for a noise barrier?**

A: Yes you can, however, FDOT only considers noise barriers under the conditions described in the answer to the previous question.

### **Q: Why doesn't FDOT take noise measurements during rush hour?**

A: Traffic noise is speed related. As vehicles move faster, more noise is produced. When traffic is at a low speed, noise levels are usually lower.



## MORE QUESTIONS

**Q: Why is there a barrier on the other side of the highway or just down the road and not in my area?**

A: Many factors affect noise levels or noise abatement measures even when traffic volumes are the same. These differences can occur when the terrain changes, the highway curves in a different direction, the highway elevation changes and / or access openings reduce noise barriers' effectiveness. Barriers are also sometimes constructed by other entities and not by FDOT.

**Q: What are the effects of vegetation on traffic noise?**

A: They are minimal. In order for vegetation to provide substantial noise reduction, it must be at least 100 feet thick and extremely dense.

**Q: How far from the noise barrier can traffic noise be reduced?**

A: Noise barriers reduce noise significantly to residences close to the barrier. Research studies performed in Florida have indicated that barriers can reduce noise up to 300 to 400 feet away from the wall, an area called the "shadow zone". Areas beyond 400 feet will not normally receive any noise reduction benefit.

**Q: Can FDOT construct a noise barrier for safety reasons?**

A: Noise barriers are not intended to be safety barriers. There are other reliable methods used, such as guardrails, to protect against vehicles running off the road.

## MORE INFORMATION

Contact the Florida Department of Transportation:



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