

## **PART 2, CHAPTER 18**

### **HIGHWAY TRAFFIC NOISE**

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## PART 2 CHAPTER 18

### HIGHWAY TRAFFIC NOISE

#### 18.1 OVERVIEW

##### 18.1.1 Purpose

This chapter is the official Florida Department of Transportation (FDOT) noise policy and procedure for the purpose of meeting the requirements of ***Title 23 of the Code of Federal Regulations (CFR) Part 772 and applicable state laws***. FDOT will apply these policies and procedures uniformly and consistently statewide.

Roadway traffic is one of the more dominant sources of noise in urban and rural areas of Florida. In an effort to encourage the control of noise, Congress passed the ***Noise Control Act of 1972***. Congress further directed the Federal Highway Administration (FHWA) to develop noise standards associated with traffic. However, effective control of traffic noise requires both the control of land use planning next to highways and feasible and reasonable abatement associated with highway projects.

The control of land use is a local government responsibility. The control of traffic noise associated with specific highway projects is the responsibility of the transportation agency (or agencies) planning, designing, and constructing a project.

The noise impact and abatement analysis policy and procedures provided in this chapter are based on ***23 CFR Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise*** dated July 13, 2010, and the FHWA guidance document ***Highway Traffic Noise: Analysis and Abatement Guidance*** dated December 2011. These two documents are incorporated into this chapter by reference. In addition, ***Section 335.17, Florida Statutes (F.S.)***, requires FDOT to develop a project in conformity with federal standards contained in ***23 CFR Part 772*** regardless of funding source and include the noise standards mandated by ***23 United States Code (U.S.C.) § 109(i)***. Highway projects developed in conformance with this regulation meet FHWA noise standards.

##### 18.1.2 Definitions

**Approach Criteria** – Approaching the criteria means within 1 A-weighted decibel [dB(A)] of the appropriate FHWA Noise Abatement Criteria (NAC) provided in [Table 18-3](#).

**Common Noise Environment (CNE)** – A group of receptors within the same activity category found in [Table 18-3](#) that are exposed to similar noise sources and levels, traffic volumes, traffic mix, speed, and topographic features. A CNE involves a group of receptors that would benefit from the same noise barrier or noise barrier system (i.e., overlapping/continuous noise barriers).

**Date of Public Knowledge (DPK)** – The approval date of the Categorical Exclusion (CE), the Finding of No Significant Impact (FONSI), the Record of Decision (ROD), State Environmental Impact Report (SEIR) or Non-Major State Action (NMSA). For a Type 1 CE and NMSA, this is the approval date of the **Type 1 Categorical Exclusion Checklist** or **Non-Major State Action Checklist**. Approved Environmental Documents are in the StateWide Environmental Project Tracker (SWEPT).

**Decibel** – A logarithmic expression of a sound level. For traffic noise analysis purposes and as specified by **23 CFR Part 772**, the A-weighted scale, which closely approximates the range of frequencies a human ear can hear, is used. The A-weighted decibel is abbreviated dB(A).

**Design Year** – The future year used to estimate the forecast traffic volume for which a highway is designed.

**Existing Noise Levels** – The noise levels that occur during the worst noise hour resulting from the combination of natural and mechanical sources and human activity usually present in a particular area.

**Feasibility** – A combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.

**Insertion Loss** – The reduction in traffic noise levels as a direct result of a specific type of abatement measure determined by calculating the difference between future build noise levels with abatement to future build noise levels without abatement.

**Level Equivalent (Leq)** – The equivalent steady-state sound level, which, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same time period, with Leq(h) being the hourly value of Leq.

**Noise Analysis Area (NAA)** – The area within and beyond the project limits that has Type I project characteristics and that requires a noise analysis. The NAA shall completely encompass the area where alterations and construction will occur, and also include any area beyond the construction limits where design year traffic may contribute to noise impacts from the project. The NAA can be sub-divided based on geographic, traffic, and other similar characteristics for grouping of CNEs.

**Noise Abatement Criterion (NAC)** – The noise level, depending upon activity category, at which FDOT must consider noise abatement for an impacted receptor. The NAC can be found in [Table 18-3](#).

**Noise Barrier** – A physical obstruction that is constructed between the highway noise source and the noise sensitive receptor(s) for the purpose of lowering the noise level, including stand-alone barrier structures, berms (earth or other materials), and combination berm/barrier structure systems.

**Noise Reduction Design Goal (NRDG)** – The optimum desired dB(A) noise reduction (insertion loss) determined by calculating the difference between future build noise levels with abatement to future build noise levels without abatement. The FDOT has selected 7 dB(A) as the NRDG for one (1) or more benefited receptors.

**Permitted** – Development will be deemed to be permitted if the local agency with jurisdiction has granted a building permit for a specific structure associated with a noise sensitive land use such as, residential, school, place of worship, medical facility, or institutional, prior to the project’s DPK.

**Predicted Existing Traffic Noise Level** – The traffic noise level that is determined through the use of the FHWA Traffic Noise Model (TNM) for existing roadway conditions.

**Predicted Future Traffic Noise Level** – The traffic noise level that is determined through the use of the TNM for the future design year traffic and roadway geometry, including build and no-build alternatives.

**Property Owner** – An individual or group of individuals that hold a title, deed, or other form of legal documentation showing ownership of a commercial or residential property.

**Reasonableness** – The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure. Reasonableness factors include consideration of viewpoints by benefited receptors, cost-effectiveness of abatement measures, and achieving the FDOT NRDG.

**Receptor** – A discrete or representative location for any of the land use categories listed in [Table 18-3](#).

Benefited Receptor – A receptor that receives a noise reduction at or above the minimum threshold of 5 dB(A) as a result of an abatement measure.

**Impacted Receptor** – A receptor with a design year build alternative traffic noise level that is predicted to approach, meet, or exceed the NAC for its respective activity category, or will experience an increase in noise levels of 15 dB(A) or more in the design year over the existing noise levels.

**Modeled Receptor** – A georeferenced location within FHWA’s TNM that represents a single or a group of receptors with the same characteristics where noise levels are predicted.

**Substantial Noise Increase** – For a Type I project (see definition below), an increase in noise levels of 15 dB(A) or more in the design year over the existing noise level (measured or predicted) as a direct result of the transportation improvement project. A substantial increase will normally occur only on new alignment projects.

**Traffic Noise Impacts** – Design year build condition noise levels that approach, meet, or exceed the federal NAC listed in [Table 18-3](#) for the future build condition, or design year build condition noise levels that create a substantial noise increase over existing noise levels.

**Type I Projects** – A highway construction project on new location or a physical alteration of an existing highway which substantially changes the horizontal and vertical alignment, profile, or adds a through lane(s). Specific project definitions according to **23 CFR Part 772** are listed in [Section 18.1.3.1](#).

**Type II Projects** - A federal or state highway project for noise abatement on an existing highway that is not being modified as part of a Type I project. Type II projects are commonly referred to as retrofit projects and are allowed (but not mandatory) under **23 CFR Part 772**. The development and implementation of Type II projects are not mandatory requirements of **23 U.S.C. § 109(i)**. The FDOT does not have a Type II program.

**Type III Projects** – A project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

### 18.1.3 Applicability

#### 18.1.3.1 Type I Projects

This policy applies to all Type I projects authorized under **Title 23 U.S.C.** and **Section 335.17, F.S.** All FDOT highway projects, regardless of funding source, shall be developed in conformance with federal standards for noise abatement as contained in **23 CFR Part 772**.

The effective date of the revisions to **23 CFR Part 772** is July 13, 2011. The following types of projects are “grandfathered” and do not have to meet the **23 CFR Part 772** final rule:

1. Federal-aid highway projects for which the Categorical Exclusion (CE), Finding of No Significant Impact (FONSI), or Record of Decision (ROD) has been signed by the effective date of the final rule, which is July 13, 2011.
2. Re-evaluations conducted during the Design phase for which approval has been received prior to July 13, 2011.

If approval of the Environmental Document and the Re-evaluation conducted during the Design phase has not been received prior to July 13, 2011, the noise study must follow the requirements of **23 CFR Part 772**. Projects for which the Environmental Document has not been approved after July 13, 2011, shall have their noise studies performed in conformance with **23 CFR Part 772** and this chapter as they exist on that date. For details concerning the Date of Public Knowledge (DPK), see [Section 18.1.3.1.1](#).

FDOT will apply these policies and procedures uniformly and consistently statewide. **Title 23 CFR Part 772** applies to all Type I projects unless the regulation specifically indicates that a section only applies to Type II or Type III projects. FDOT State Projects shall be “grandfathered” and will not have to meet the **23 CFR Part 772** final rule if the State Environmental Impact Report (SEIR) or **Non-Major State Action Checklist** has been signed by July 13, 2011.

It should be noted that the project type (defined here as “Type I, Type II, or Type III”) is independent of the Class of Action (COA) determination for the overall project. **Title 23 CFR § 772.5** and FDOT policy define Type I projects as:

1. The construction of a highway on new location;

2. The physical alteration of an existing highway where there is either;
  - i. Substantial Horizontal Alteration – A project that halves the distance between the traffic noise source (edge of the nearest travel lanes) and the closest receptor between the existing condition to the future build condition; or,
  - ii. Substantial Vertical Alteration – A project that removes shielding [not including vegetation removal by FDOT within FDOT Right of Way (ROW)] that exposes the line-of-sight between the receptor and the traffic noise source. This may happen when the vertical alignment of the highway is altered, or if the topography between the highway traffic noise source and the receptor is altered, such as reducing the back slopes of a cut section so that the line of sight is no longer blocked;
3. The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a High-Occupancy Vehicle (HOV) lane, High-Occupancy Toll (HOT) lane, express/managed lane, bus lane, or truck climbing lane;
4. The lengthening of an existing interchange ramp's acceleration or deceleration lane and associated merging into the mainline to a total of more than 2,500 feet (from the gore to the end of the lane) (FDOT policy);
5. The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane;
6. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange;
7. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane;
8. The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza. (Note: Reconstruction of an existing rest stop/service plaza in the median of an existing highway that does not cause substantial alteration and does not affect existing traffic patterns on the roadway, along with the conversion of a conventional toll plaza to an all-electronic toll plaza do not qualify as Type I projects).
9. If any section of a project is determined to be a Type I project under this definition, then the Noise Analysis Area (NAA) shall completely encompass the entire project area as defined in the Environmental Document and shall also include any area beyond the construction limits where design year traffic may contribute to noise impacts from the project. The NAA can be sub-divided based on geographic, traffic, and other similar characteristics for grouping of Common Noise Environments (CNEs).

For more detailed descriptions of Type I projects, please see the Type I Project Matrix in [Table 18-4](#).

For projects that propose to use highway shoulders for part-time use, it should be determined whether such an improvement constitutes a Type I project as discussed in FHWA's publication ***Use of Freeway Shoulders for Travel — Guide for Planning, Evaluating, and Designing Part-Time Shoulder Use as a Traffic Management Strategy***. In general, for bus-on-shoulder projects, noise analysis may be qualitative because the number of additional vehicles and changes in speed are small or nonexistent. For static and dynamic part-time shoulder use that involves higher volumes of mixed traffic, the need for noise analysis will typically be determined in a manner similar to a conventional widening project because the shoulder essentially functions as an additional travel lane.

### 18.1.3.1.1 Date of Public Knowledge

The DPK is defined in **23 CFR § 772.5** and is the date of approval of the Environmental Document. The original DPK for projects where the Environmental Document has been approved will remain valid unless Office of Environmental Management (OEM) determines that a ***National Environmental Policy Act (NEPA)*** document or decision needs to be revisited and re-evaluated in accordance with **23 CFR § 771.129** or **23 CFR § 771.130**.

If a project has design changes that do not require a new Environmental Document but would independently constitute a Type I noise project, where it is determined that a project change warrants an update of the original ***Noise Study Report (NSR)***, then additional noise impacts may be considered and mitigated in the areas of the design changes, including those not meeting the original DPK. However, the original DPK for projects where the Environmental Document has been approved will remain valid.

### 18.1.3.2 Type II Projects

A Type II Project is a federal or state highway project for noise abatement on an existing highway. Type II projects are commonly referred to as retrofit projects in **23 CFR Part 772**. The development and implementation of Type II projects are not mandatory as described in **23 U.S.C. § 109(i)**. **FDOT does not have a Type II program.**

### 18.1.3.3 Type III Projects

A Type III Project is a federal or state highway project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis or consideration of abatement measures.

Examples of Type III projects include:

1. Construction of turn lanes at intersections associated with arterial highways.
2. Construction of bicycle and pedestrian lanes, paths, and facilities;
3. Activities included in the FDOT highway safety plan under **23 U.S.C § 402**, provided those activities do not contain elements of Type I projects;

4. Landscaping (including the removal of existing vegetation by FDOT within FDOT ROW);
5. Installation of fencing, signs, pavement markings, small passenger shelters, traffic signals, and railroad warning devices where no substantial land acquisition or traffic disruption will occur;
6. Deployment of electronics, photonics, communications, or information processing used singly or in combination, or as components of a fully integrated system, to improve the efficiency or safety of a surface transportation system or to enhance security or passenger convenience;
7. Modernization of a highway by surfacing, restoration, rehabilitation, or reconstruction, provided the project does not contain elements of Type I projects; or
8. Placement of overhead gantries on a highway to collect tolls electronically that do not disrupt existing traffic patterns.

## 18.2 PROCEDURE

### 18.2.1 Efficient Transportation Decision-Making Screening

During the Efficient Transportation Decision-Making (ETDM) screening and prior to the Project Development and Environment (PD&E) phase, a preliminary review of potential noise impacts associated with a project is conducted by the FDOT. This review determines if noise sensitive receptors are or may be located within the project area and if there is a possibility that noise sensitive receptors will be impacted due to predicted traffic noise levels with a build alternative approaching or exceeding the Noise Abatement Criteria (NAC) shown in [Table 18-3](#). The review includes the assessment of land use plans, aerial photographs, field reviews, modeling, and/or similar efforts. This allows the District Noise Specialist and the Project Manager to determine whether noise impacts are likely to occur based on the types of land uses present and their proximity to the proposed project and assist in the development of the scope of services for the PD&E Study.

### 18.2.2 Project Development and Environment Phase

During a the PD&E phase for a Type I project, FDOT will conduct predictive analysis required by **23 CFR § 772.9** using the FHWA Traffic Noise Model (TNM) software that is current as of the time of analysis (Note: TNM version 2.5 may be used until the next version of TNM is required for use by FHWA). Traffic noise prediction must adhere to all direction contained in the FDOT [Traffic Noise Modeling and Analysis Practitioners' Handbook](#) and the following:

1. A traffic noise analysis shall be completed for the alternative(s) under detailed study and for each Activity Category of the NAC shown in [Table 18-3](#) that is present in the study area. Consistent with **23 CFR § 772.11(c)**, noise level predictions will be required for the following project alternatives and study years:

<u>ALTERNATIVE</u>	<u>YEAR</u>
No-build	Existing and Design year
Build	Design year only

2. For low-volume two lane roadways (that will be two lanes wide after completion of the project), a screening test can be initiated using the FHWA Traffic Noise Screening Tool (TNST), which is based on TNM. A detailed study (using TNM) is required if the project does not pass the screening test (see item 3 below), which means that the calculated noise levels are within 5 dB(A) of the NAC.
3. See [Part 1, Chapter 102 of the FDOT Design Manual \(FDM\), Topic No. 625-000-002](#) for the definition of “low volume road” and **Table 102.1.1, Average Annual Daily Traffic (AADT) Thresholds for Low and High Volume Roads**, for the urban and rural low volume AADTs for two-lane roadways.
4. Traffic characteristics that yield the highest traffic noise impact for the design year shall be used for predicting noise levels and assessing noise impacts.
5. **Title 23 CFR Part 772** specifies that either the Leq(h) or L10(h) metric, but not both, may be used on a project. Consistent with this requirement, FDOT requires use of the Leq(h) metric.
6. Consistent with **23 CFR § 772.9(b)**, average pavement type shall be used in the FHWA TNM for future noise level predictions. However, in the assessment of existing conditions (including the validation of field measurements), the actual pavement type may be used at the discretion of the District Noise Specialist.

The use of noise contour lines is allowed for project alternative screening or for land use planning to comply with **23 CFR § 772.17**, but noise contours shall not be used for determining highway traffic noise impacts or the determination of the feasibility and reasonableness of providing noise impact abatement.

The results of the PD&E Study noise analyses should be reported in a **NSR** and summarized in the appropriate section of the Environmental Document. For Type I projects that qualify as a Type 1 Categorical Exclusion or Non-Major State Action (NMSA), FDOT will follow the same procedure as for the PD&E phase.

### **18.2.2.1 Environmental Document**

The expected level of noise impacts varies depending on the type of Environmental Document. The Environmental Document shall identify locations (NAA or CNEs) where noise impacts are predicted to occur, where noise abatement is feasible and reasonable, and locations with impacts that have no feasible or reasonable noise abatement alternative.

The final **NSR** is uploaded into the SWEPT project file and a summary should be included in the Environmental Document. The Highway Traffic Noise section of the Environmental Document should contain enough detail to convey the degree of noise impact attributed

to the proposed project, along with certain required statements. The Environmental Document must reference the **NSR** for additional details using a statement similar to the following:

*The **Noise Study Report** for this project is available from the District Office, located at \_\_\_\_\_.*

The Environmental Document will also include information regarding the consideration of noise abatement measures that have or have not been determined to be feasible and reasonable based on the information available at the time the **NSR** was completed.

After OEM grants Location and Design Concept Acceptance (LDCA) for an FDOT Federal Project, or a SEIR has been approved, a copy of the **NSR** is sent to the appropriate local government officials who have jurisdiction where the highway project is located. Other information to aid these officials in their planning and land use decisions to minimize highway noise impacts in the future may be sent along with the **NSR**.

Type III projects do not require a noise analysis. For these projects, the Highway Traffic Noise section within the Environmental Document should include a statement similar to the following:

*This project has been determined to be a Type III project as defined in **23 CFR § 772.5** and does not require a noise analysis.*

### **18.2.2.1.1 Type 2 Categorical Exclusion**

On the **Type 2 Categorical Exclusion Determination Form** in SWEPT, identify if it is a Type I or Type III project ([Section 18.1.3](#)) pursuant to **23 CFR Part 772** and **Section 335.17, F.S.** Summarize the results of noise impacts documented in the **NSR**. The summary should include locations (NAA or CNEs) with the predicted noise impacts that have feasible and reasonable abatement barriers, and locations with Impacts that have no feasible or reasonable noise abatement alternative. Include the **NSR** as Technical Material and add a map for noise as an attachment, if applicable.

### **18.2.2.1.2 Environmental Assessment with Finding of No Significant Impact**

The Highway Traffic Noise section of the Environmental Assessment (EA) must reference and summarize the **NSR**. Specific references to the items discussed in [Section 18.2.2](#) and [Section 18.2.3](#) are included as appropriate. Coordination which occurred during the noise study is included in the Appendix. This includes letters from agencies including comments on the **NSR**. Comment resolution is also documented in the Appendix. In the FONSI, provide a summary of all noise impacts resulting from the project if there were changes from the EA, or refer to the appropriate section of the EA. If abatement measures are being recommended for further consideration, identify the sites for which the abatement is proposed. For those locations (NAA or CNEs) with impacts where abatement is not feasible and/or reasonable, provide those locations and an explanation

as to why the abatement measure(s) considered was determined to not be feasible and/or reasonable.

### 18.2.2.1.3 Draft Environmental Impact Statement

The Highway Traffic Noise section of a Draft Environmental Impact Statement (DEIS) should summarize the **NSR** and include the following information:

1. A brief description of noise sensitive areas and their location (NAA or CNEs), including information on the numbers and types of activities which may be impacted. The availability of the **NSR** at the District Office.
2. The extent of the impact (in decibels). Including a brief description of the methodology used and identification of the computer model used, along with a comparison of the future predicted noise levels with both FHWA NAC and the existing predicted noise levels.
3. Noise abatement measures which have been considered and those measures that would likely be incorporated into the proposed project.
4. Noise impacts for which no feasible and reasonable abatement is available and the reasons why.

### 18.2.2.1.4 State Environmental Impact Report

The Highway Traffic Noise section of a SEIR should summarize the anticipated traffic noise impacts identified in the **NSR** and appropriately reference the basis for decision the same as for an FDOT Federal Project as described in [Section 18.2.2.1](#). The applicable standard statements and Statement of Likelihood contained in the FDOT [Traffic Noise Modeling and Analysis Practitioners' Handbook](#) should be included.

## 18.2.3 Design Phase

During the Design phase, noise level predictions are required for the selected build alternative and Design year only, unless a substantial increase has been identified during the project's PD&E phase. If a substantial increase of 15 dB(A) or greater is identified during the PD&E phase, existing noise levels must be re-evaluated during subsequent evaluations. Noise predictions must adhere to all direction contained in the FDOT [Traffic Noise Modeling and Analysis Practitioners' Handbook](#).

The results of the Design phase noise analyses should be reported in a **Design Noise Study Report (DNSR)** and summarized in the appropriate section of the Environmental Document or Re-evaluation (see [Part 1, Chapter 13, Re-evaluations](#)).

## 18.2.4 Re-evaluations

The Re-evaluation of any Environmental Document that included an **NSR** should also include an update of the traffic noise analysis. Assumptions made and data used during the original noise analysis and documented in the **NSR** should be reviewed and updated

to ensure the assumptions and any preliminary commitments are still valid. This may include, but not necessarily be limited to, current and future traffic data (volumes, speeds, composition), roadway alignment (horizontal and vertical), land use, propagation path, barriers/buffers (including trees, berms, structures), variation in terrain between noise source and receptors. Changes to the horizontal and vertical roadway alignment should follow the guidance provided in the Type I Projects Matrix provided in [Table 18-4](#). The Re-evaluation may result in no change to the **NSR** or in a completely new **NSR** being required. At a minimum, it must be documented that the original noise study and analysis was reviewed and that the assumptions, project conditions and results are still valid. Computer modeling efforts are conducted, using the latest approved version, for any subsequent Re-evaluation as a result of a major design change that requires additional noise analysis.

Coordination with OEM during the Re-evaluation process on FDOT Federal Projects is required (see [Part 1, Chapter 13, Re-evaluations](#)).

The final noise abatement commitments must be documented in the Re-evaluation and the **DNSR** prior to construction advertisement, regardless of project funding sources. Additionally, the **Project Commitment Record (PCR)** must also be updated. If the **DNSR** is substantially modified from the version previously distributed to the affected local governments, a revised version should be sent out to them.

## 18.3 NOISE IMPACT DETERMINATION

**Table 1 of 23 CFR Part 772 – Noise Abatement Criteria** establishes the thresholds that are used to determine whether a highway traffic noise impact occurs. The table is also found in [Table 18-3](#). A traffic noise impact occurs when the modeled future highway traffic noise levels for the worst-case noise condition approach or exceed the NAC. A traffic noise impact also occurs when modeled future highway traffic noise levels substantially exceed the existing highway traffic noise level, even though the modeled levels may not exceed the NAC. FDOT has determined that the NAC is approached when it is within 1 dB(A) of the appropriate federal NAC and that a substantial increase occurs when the increase over existing conditions (measured or predicted) is 15 dB(A) or greater. To assess the highway traffic noise impact of a project, both criteria (approach of the NAC and substantial increase) must be evaluated.

Design year traffic noise impacts are based on the modeled build noise levels or the difference between the build and existing measured or modeled traffic noise levels. If one or more noise sensitive receptors are impacted by project related traffic noise levels that approach or exceed the NAC or substantially increase when compared to existing (measured or predicted) noise levels, then abatement measures must be considered. If the abatement criteria are not approached or exceeded and if projected traffic noise levels do not substantially exceed existing noise levels, abatement measures will not be considered.

### 18.3.1 Existing Noise Barriers

Projects which have existing noise barriers present should follow guidance in the FDOT's publication [Methodology to Evaluate Existing Noise Barriers](#).

## 18.4 NOISE ABATEMENT MEASURES

When impacted receptors are identified, noise abatement shall be considered and evaluated for feasibility and reasonableness. FDOT should determine and analyze alternative noise abatement measures to abate identified impacts by giving weight to the benefits and costs of abatement and the overall social, economic, and environmental effects by using feasible and reasonable noise abatement measures for decision-making. In abating traffic noise impacts, FDOT should give primary consideration to exterior areas where frequent human use occurs. Noise abatement will not be required for Activity Category F or Activity Category G uses described in [Table 18-3](#).

Federal funds may be used for noise abatement on Type I projects when traffic noise impacts have been identified and abatement measures have been determined to be feasible and reasonable pursuant to **23 CFR § 772.13(d)**. The abatement measures listed in **23 CFR § 772.15(c)** are eligible for federal funding.

The primary noise abatement measure considered by FDOT for incorporation into a Type I project to reduce traffic noise impacts is the construction of a noise barrier.

It is not a standard practice for FDOT to use absorptive treatments on noise barriers. Their use is considered on a case-by-case basis under the following conditions:

1. Absorptive surface treatments for the roadway side of a noise barrier should only be considered in parallel noise barrier situations where a width-to-height ratio of 10:1 or more cannot be achieved. The width is the distance between the two parallel noise barriers and the height is the average height of the barriers above the roadway. For example, if the average height of two parallel noise barriers is 20 feet, they should be at least 200 feet apart to avoid a reduction in their effectiveness due to reflections. The parallel barrier analysis module within TNM should be used to evaluate the impact of reflections on the performance of parallel noise barriers.
2. Absorptive surface treatments should only be considered for the roadway side of single (non-parallel) noise barriers when the distance from the face of the noise barrier to the nearest noise sensitive receptor on the opposite side of the roadway (across from the barrier) is less than 10 times the average height of the noise barrier above the roadway.

As noted in **23 CFR § 772.13(c)(1)**, at a minimum, the FDOT should consider noise abatement in the form of a noise barrier.

When considering noise barriers for noise abatement, the feasibility and reasonableness factors discussed in this policy and discussed in the FDOT [Traffic Noise Modeling and](#)

[Analysis Practitioners' Handbook](#) must be evaluated for each viable alternative under detailed analysis. **Landscaping is not a viable noise abatement measure.** Feasibility and reasonableness factors are listed in [Table 18-1](#) and are discussed in detail in [Section 18.4.1](#) and [Section 18.4.2](#).

**Table 18-1 Feasible and Reasonable Requirements for a Noise Barrier**

Feasible	Reasonable
At least two impacted receptors must be provided a noise reduction of 5 dB(A).	A noise barrier must also attain the Noise Reduction Design Goal (NRDG), which states that a minimum noise reduction of 7 dB(A) for at least one benefited receptor must be achieved. This receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction.
Engineering factors (design/construction, safety, access, ROW, maintenance, drainage, and utility) must be considered, and all conflicts must be resolved.	The cost of the noise barriers should not exceed \$64,000 per benefited receptor. This is the upper cost limit established by FDOT. A benefited receptor is defined as a recipient of an abatement measure that experiences at least a 5 dB(A) reduction as a result of providing a noise barrier. The current unit cost used to evaluate cost reasonableness is \$40 per square foot (sq. ft.).
--	The viewpoint of benefited receptors must be considered.

### 18.4.1 Feasibility Factors

Feasibility factors for noise abatement measures involve both acoustic (noise reduction) and engineering considerations when considering a potential abatement measure.

1. Any receptor that receives a minimum noise level reduction of 5 dB(A) due to a noise barrier shall be considered a benefited receptor. The number of impacted receptors required to achieve a 5 dB(A) reduction or greater in order for a noise barrier to be considered feasible will be equal to two residences or greater.
2. Consideration should be given to whether a noise barrier can be constructed using standard construction methods and techniques. Factors to be considered include terrain changes, utilities, safety (e.g., lane closures, sight distance), bridges, overpasses, and similar difficulties.

### 18.4.2 Reasonableness Factors

The following reasonableness factors must collectively be achieved in order for the noise abatement measure to be deemed reasonable:

1. Achievement of the FDOT Noise Reduction Design Goal (NRDG). As stated in **23 CFR § 772.13(d)(2)(iv)** for an abatement measure to be considered reasonable, it must attain the FDOT NRDG. To ensure the provision of reasonable traffic noise abatement consideration at the greatest number of impacted locations, FDOT has selected a 7 dB(A) noise level reduction for one or more benefited receptors as the NRDG. Failure to achieve the NRDG results in the noise abatement measure being deemed not reasonable. The NRDG should be applied to residential as well as non-residential (i.e., special land uses) noise barrier evaluations.
2. Cost-effectiveness of the highway traffic noise abatement measure. FDOT has established cost-effectiveness criteria. The basis for the cost-effectiveness criteria is that FDOT has provided approximately 1,600 square feet of noise barrier per benefited receptor at a reasonable cost. Using the current average unit cost of \$40 per square foot, a reasonable cost of \$64,000 per benefited receptor is looked upon as the upper limit. Only benefited receptors will be included in the calculation used to determine if a proposed noise abatement measure has a reasonable cost. Note that this cost does not include the cost of an optional additional taper of vertical height for shoulder mounted noise barriers, as this is a safety feature. Cost factor elements are re-analyzed by FDOT every five years, with the last analysis and approval occurring in 2024. The relationship between unit costs and the upper limit for cost-effectiveness will be based on maintaining a constant upper limit of 1,600 square feet of noise barrier per benefited receptor. This upper limit is derived by multiplying the statewide average height of noise barriers in Florida of 16 feet by a theoretical barrier length of 100 feet. FDOT considers the following elements as part of the overall calculation of cost effectiveness of a noise barrier:
  - a. The cost of materials and labor (\$40 per square foot multiplied by the area of a proposed noise barrier, as referenced above);
  - b. The cost of additional ROW (including the cost of construction and/or maintenance easements) needed exclusively to construct the noise barrier (if any);
  - c. The cost of new or upgraded drainage structures required by the construction of a noise barrier;
  - d. The standard cost of the barrier foundation and any specialized foundation due to site conditions are to be included in the calculations of cost-effectiveness. However, if the foundation and earthwork is part of the road construction, it should not be included in the noise barrier cost calculations.
  - e. On projects where Florida Gas Transmission (FGT) facilities are present within FDOT ROW, the [\*\*FGT Agreement and Global Settlement\*\*](#) controls the responsibilities of both FDOT and FGT. Where a noise barrier is proposed to be located within the below clearances to FGT's facilities, FGT may, at its sole discretion, decide to move its facilities.

1. Single Line:

- a. Nine inch internal diameter or greater: 15 feet unencumbered from the outside edge of the line plus 25 feet additional temporary workspace on one side of the 15-foot unencumbered space.
  - b. Less than nine inch internal diameter: 5 feet unencumbered from the outside edge of the line plus 10 feet additional temporary workspace on one side of the 5-foot unencumbered space.
2. Two Lines: 60 feet, measured from the center line of the pipelines, with no additional temporary workspace.
  3. Three Lines: 75 feet, measured from the center line of the two outside pipelines, with no additional temporary workspace.

For pipelines at those locations where the width between two pipelines is greater than 30 feet, and for three pipelines where the width between the center line of the two outermost pipelines is greater than 45 feet, such pipelines should constitute single pipelines as identified in item number 1 (Single Line) above for the purposes of establishing the Specified Width; provided, however, pipelines that are equal to or less than 30 feet apart measured from the center line of the two pipelines should be treated as two pipelines consistent with item number 2 above (Two Lines).

If FGT decides to move its facilities, FGT and FDOT may split the cost of ROW acquisition, construction, and other project costs in accordance with the [FGT Agreement and Global Settlement](#). Any additional costs incurred by FDOT should be included in the cost reasonableness calculations for the proposed noise barrier. If FGT decides not to relocate its facilities, alternative locations for noise barrier placement shall be investigated. Any additional costs incurred as a result of the relocated noise barrier should be included in the cost reasonableness calculations for that noise barrier.

Cost elements do not include the cost of designing the noise barrier, relocation of utilities (above or below ground) that are permitted within FDOT ROW, clearing and grubbing, mobilization, maintenance of traffic, construction engineering and inspection, and related activities that are considered as part of the total construction project. To be considered as a noise abatement cost, the costs must be incurred solely because of the installation of the noise barrier. An example would be when there is a need to extend a culvert that would not be necessary for roadway construction but is required to construct the noise barrier.

The FDOT [Methodology to Evaluation Highway Traffic Noise at Special Land Uses](#) shall be used to ensure the reasonableness of abatement for Activity Category C, D, and E land uses described in [Table 18-3](#).

In the case of Recreational Vehicle (RV) parks that also serve as a mobile home site, noise abatement will be considered when at least 51 percent of the noise impacted spaces are occupied 51 percent of the year or more by “permanent”

residents. A permanent resident would be one who occupies the dwelling unit at least 51 percent of the calendar year. For these locations, where usage is often seasonal and of short duration, the property owner will determine the occupancy rate of that portion of the facility that is impacted by traffic noise. If less than 51 percent of the impacted spaces are occupied less than 51 percent of the year, abatement measures are not considered. The same occupancy requirements apply for other forms of temporary housing not identified here and are considered on a case-by-case basis in consultation with OEM. The noise abatement measure must be feasible and reasonable before it will be considered further.

**Third-party funding is not allowed to subsidize the cost of a noise barrier for the purpose of making the noise barrier feasible or reasonable.** Third-party funding as noted in **23 CFR § 772.13(j)** is acceptable on an FDOT Federal Project that is a Type I project to make functional enhancements as long as the noise abatement measure already has been determined to be feasible and reasonable.

3. Consideration of the viewpoints of the benefited property owners and residents.

During the Design phase of the project, FDOT uses a noise abatement workshop and/or a public survey to determine the wishes of the benefited receptors. Each benefited receptor (owner or resident) is given the opportunity to provide input to FDOT regarding their desire to have the proposed noise abatement measure constructed. They may also be given the opportunity (at the discretion of the District) to provide input regarding their aesthetic preferences from a list of pre-selected options.

It is the desire of FDOT to obtain a response for or against the noise barrier from a numerical majority (greater than 50 percent) of the benefited receptors (owners and residents) that provide a response to the survey. Multiple techniques to solicit input may be used, including multiple mailings, door-to-door follow-up, and even telephone solicitation (as needed) to provide adequate information to allow FDOT to make an informed decision on whether abatement is desired or not. If, after three attempts to gather the input from the benefited receptors, a minimum response rate of 50 percent is not achieved, FDOT may determine the abatement measure to be not reasonable. If a numerical majority of the benefited residents and property owners that provide a response to the survey do not favor the construction of a noise barrier, FDOT will not provide the noise barrier. It is important to note that the viewpoints of the property owner are considered as having the greatest weight in the decision as to whether FDOT will provide noise abatement. While the viewpoint of the non-owner resident is considered, their viewpoint carries less weight, consistent with the formula shown in [Table 18-2](#).

**Table 18-2 Viewpoint Weighting Factors**

Property Type	Owner Occupies Property	Owner Does not Occupy Property	
		Owner	Renter
Single Family	100%	90%	10%
Multifamily (duplex, apartments, condominiums)*	100%	90%	10%
Mobile Home Park*	100%	80%	20%
Offices, Businesses	100%	80%	20%

\* The weighting factor is for each unit (mobile home, apartments, condominiums), not for the entire mobile home park, apartment complex or condominium building.

The input of Homeowners Associations (HOA) should be considered during the survey process, especially if the HOA owns common land adjacent to FDOT ROW where the noise barrier would be located. However, no formal vote should be made by the HOA and the desires of the HOA cannot preclude those benefited receptors behind the noise barrier.

The construction of business names/logos or building addresses on noise barriers is in violation of **23 CFR § 750.709**. For noise barriers in urban and suburban areas, imprinting of subdivision names or logos on the noise barrier may be considered only at the portion of the noise barrier at the legal entrance to the subdivision. FDOT allows consideration of noise barrier aesthetic enhancement that meets FHWA regulations related to this process. Each request for such an application is handled on a case-by-case basis.

If additional property is needed to accommodate provision of a noise barrier that is feasible and cost-reasonable, the FDOT can consider the purchase of additional ROW or make a request for the donation of ROW from the adjacent property owners(s) for the purpose of noise barrier construction and/or maintenance. Per **Section 7.14.3.1** of the [Right of Way Procedures Manual, Topic No. 575-000-000](#), prior to accepting a donation of property, FDOT must advise the owner that they have the right to receive just-compensation for the property being donated, and reimbursement of any incidental costs associated with the transfer of the property. All donated/purchased property needed to accommodate noise abatement must be contiguous to FDOT ROW and must be included in the cost-reasonable calculation. If the purchase of additional ROW for the sole purpose of noise barrier construction and/or maintenance exceeds the cost-reasonable limit, the barrier may be found to be not reasonable.

Noise abatement is analyzed a minimum of two times during the development of a project. The first time is during the PD&E phase when the Environmental Document is prepared. The second time noise abatement is analyzed is during the Design phase prior to Plans, Specifications, and Estimates (PS&E) approval. Any noise sensitive receptor that is permitted between the completion of the **NSR** and the DPK will be analyzed for traffic noise impacts and, if impacts are predicted, abatement will be considered during the Design phase of the project.

### 18.4.3 Outdoor Advertising Sign Impacts

Although it is not to be considered as either a feasibility or reasonableness option, Florida Law requires consideration of the potential to construct a noise barrier that might block the motorist's view of an existing, conforming, and legally permitted outdoor advertising sign.

Outdoor advertising signs that are legally permitted, conforming, and erected may increase the height of the sign if visibility is blocked due to the construction of "noise attenuation" barriers consistent with **Section 479.25, F.S.** This statute requires FDOT to notify a local government or local jurisdiction before erecting a noise barrier that will block a lawfully permitted sign. The local government or local jurisdiction is then required to notify FDOT if increasing the height of an outdoor advertising sign will violate any local ordinance or land development regulation of the local government. When the notice has been received from the local government or local jurisdiction, and prior to the erection of the noise barrier, FDOT shall inform all property owners identified as impacted by highway noise and who may benefit from the proposed noise attenuation barrier, as part of a written survey, that:

1. Erection of a specific noise barrier may block the visibility of an existing outdoor advertising sign;
2. The local government or local jurisdiction may restrict or prohibit increasing the height of the existing outdoor advertising sign to make it visible over the noise barrier; and
3. If a majority of the impacted property owners vote for the construction of the noise barrier, the local government or local jurisdiction will be required to:
  - a. Allow an increase in the height of the sign in violation of a local ordinance or land development regulation;
  - b. Allow the sign to be relocated or reconstructed at another location if the sign owner agrees; or
  - c. Pay the fair market value of the sign and its associated interest in the real property.

The statute also requires FDOT to hold a public hearing within the boundaries of the affected local government or local jurisdiction. This public hearing solicits input on proposed noise barriers that may conflict with the local ordinances or land development regulations. The public hearing also suggests or considers alternatives or modifications to the proposed noise barrier to alleviate or minimize the conflict with the local ordinances or land development regulations, and/or minimize any costs associated with relocation, reconstructing, or paying for the affected outdoor advertising sign. Alternatives or modifications to proposed noise barriers that would not provide the minimum 5 dB(A) reduction will not be considered. See [Part 1, Chapter 11, Public Involvement](#) for details on holding a public hearing.

FDOT shall not construct a noise barrier that screens or blocks the visibility of a lawfully permitted outdoor advertising sign until after the public hearing is held and the numerical majority of the impacted property owners have approved the construction of the noise barrier. If the construction of the noise barrier is approved, FDOT shall notify the local governments or local jurisdictions. The local governments or local jurisdictions shall then exercise one of the options listed above.

## 18.5 COMMUNITY COORDINATION

The degree and type of community coordination and participation will vary from project to project. For projects in the PD&E phase, requiring consideration of abatement, the community involvement activities should include presentation and discussion of noise impacts related to the project. Opportunities for such involvement will be provided, as appropriate, during the PD&E phase as part of the public involvement and/or public hearing process.

When noise abatement is anticipated in the Design phase, community coordination will include a survey of benefited property owners and residents to determine their viewpoints regarding abatement. The viewpoint of the benefited receptors (property owners and residents) related to abatement should be analyzed in the decision-making process in accordance with [Section 18.4.2](#) of this policy.

When the Environmental Document is approved, a copy of the project's **NSR** is transmitted to the appropriate local government officials within whose jurisdiction the highway project is located. A sample **NSR** transmittal letter can be found in the [FDOT Noise Modeling and Analysis Practitioners' Handbook](#). The following information should be transmitted along with the **NSR** consistent with **23 CFR § 772.17(a)**:

1. Noise compatible planning concepts;
2. A representation of the estimated distances from the proposed edge of pavement at which traffic noise levels would approach or exceed the NAC for Activity Categories A through E, described in [Table 18-3](#), for each segment of the project; and
3. After the DPK, FDOT is no longer responsible for providing noise abatement to new development which occurs adjacent to the proposed highway project.

The above items are intended solely to assist local officials and private developers in promoting compatibility between land development and highways. Upon request, FDOT may provide additional available material and technical guidance which may assist local officials and private developers in this respect.

### 18.5.1 Abatement Measure Reporting

**Title 23 CFR § 772.13(f)** requires that each highway agency maintain an inventory of all constructed noise abatement measures. To comply with the inventory requirement, FDOT maintains an inventory of all noise abatement barriers constructed on the State Highway

System (SHS) in a Geographic Information System (GIS) layer housed in the University of Florida's GeoPlan Center Florida Geographic Data Library (FGDL). Each District Noise Specialist must annually gather and provide inventory data to the University of Florida's GeoPlan Center.

This inventory data will include at least the following parameters:

1. Type of abatement;
2. Cost (overall cost, unit cost per/sq. ft.);
3. Average height;
4. Length;
5. Area;
6. Location (state, county, city, route);
7. Year of construction;
8. Average insertion loss/noise reduction as reported by the model in the noise analysis;
9. NAC category(s) protected;
10. Material(s) used (precast concrete, berm, block, cast in place concrete, brick, metal, wood, fiberglass, combination, plastic [transparent, opaque, other]);
11. Features (absorptive, reflective, surface texture);
12. Foundation (ground mounted, on structure); and
13. Project type (Type I, Type II) and optional project types such as state funded, county funded, tollway/turnpike funded, other, unknown. The FHWA will collect this information, in accordance with Office of Management and Budget's Information Collection requirements.

For a complete list of items to be reported by the District Noise Specialist, see the FGDL attributes metadata website ([Section 18.6](#)). Federal submission requirement fields are prefaced with FED in the FGDL database.

The noise abatement barriers data is reported tri-annually to FHWA once a request is received to submit the report. At the request of OEM, the GeoPlan Center prepares the tri-annual report submitted by the State Noise Program Coordinator to the FHWA Florida Division Office in the format required by *23 CFR § 772.13(f)*.

## 18.6 REFERENCES

FHWA, Report Number FHWA-PD-96-009, FHWA Traffic Noise Model User's Guide. April 2004.

[http://www.fhwa.dot.gov/environment/noise/traffic\\_noise\\_model/tnm\\_v25/users\\_manual/index.cfm](http://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_v25/users_manual/index.cfm)

FHWA, Report FHWA-HEP-10-025, Highway Traffic Noise: Analysis and Abatement Guidance, December 2011.

[https://www.fhwa.dot.gov/environment/noise/regulations\\_and\\_guidance/analysis\\_and\\_abatement\\_guidance/revguidance.pdf](https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf)

FHWA, Use of Freeway Shoulders for Travel — Guide for Planning, Evaluating, and Designing Part-Time Shoulder Use as a Traffic Management Strategy, February 2016. <https://ops.fhwa.dot.gov/publications/fhwahop15023/>

FDOT, Design Manual, Topic No. 625-000-002. <https://www.fdot.gov/roadway/fdm>

FDOT, Methodology to Evaluate Highway Traffic Noise at Special Land Uses, December 2024. [https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/pubs/noise/slu-guidance-document\\_december-2024.pdf?sfvrsn=5e5abcb2\\_3](https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/pubs/noise/slu-guidance-document_december-2024.pdf?sfvrsn=5e5abcb2_3)

FDOT, Methodology to Evaluate Existing Noise Barriers. February 2025.

[https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/existing-noise-barrier-guidance-document\\_02-20-25.pdf?sfvrsn=cc867100\\_1](https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/existing-noise-barrier-guidance-document_02-20-25.pdf?sfvrsn=cc867100_1)

FDOT, Right of Way Procedures Manual, Topic No. 575-000-000.

<https://www.fdot.gov/rightofway/ProceduresManual.shtm>

FDOT, Traffic Noise Modeling and Analysis Practitioners' Handbook, September 2025.

[https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/pubs/noise/noise-practitioners-handbook\\_september-2025.pdf?sfvrsn=81a11a24\\_1](https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/pubs/noise/noise-practitioners-handbook_september-2025.pdf?sfvrsn=81a11a24_1)

Section 335.02, F.S., Authority to designate transportation facilities and rights-of-way and establish lanes; procedures for re-designation and relocation; application of local regulations.

[http://www.leg.state.fl.us/Statutes/index.cfm?App\\_mode=Display\\_Statute&Search\\_String=&URL=0300-0399/0335/Sections/0335.02.html](http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0335/Sections/0335.02.html)

Section 479.25, F.S., Erection of noise-attenuation barrier blocking view of sign; procedures; application. July 1, 2014.

[http://www.leg.state.fl.us/Statutes/index.cfm?App\\_mode=Display\\_Statute&Search\\_String=&URL=0400-0499/0479/Sections/0479.25.html](http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0400-0499/0479/Sections/0479.25.html)

Section 335.17, F.S., State highway construction; means of noise abatement. 2012.

[http://www.leg.state.fl.us/Statutes/index.cfm?App\\_mode=Display\\_Statute&Search\\_String=&URL=0300-0399/0335/Sections/0335.17.html](http://www.leg.state.fl.us/Statutes/index.cfm?App_mode=Display_Statute&Search_String=&URL=0300-0399/0335/Sections/0335.17.html)

Title 23 CFR § 750.709, On-property or on-premise advertising. <https://ecfr.io/Title-23/pt23.1.750>

Title 23 CFR § 771, Environmental Impact and Related Procedures.

<https://www.ecfr.gov/current/title-23/chapter-I/subchapter-H/part-771>

Title 23 CFR § 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, Tuesday, July 13, 2010. [http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title23/23cfr772\\_main\\_02.tpl](http://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title23/23cfr772_main_02.tpl)

University of Florida, GeoPlan Center. Florida Geographic Data Library (FGDL) Metadata Explorer. <http://fgdl.org/metadataexplorer/explorer.jsp>

**Table 18-3 Noise Abatement Criteria**

NOISE ABATEMENT CRITERIA (NAC) [Hourly A-Weighted Sound Level-decibels (dB(A))]				
Activity Category	Activity Leq(h) <sup>1</sup>		Evaluation Location	Description of Activity Category
	FHWA	FDOT		
A	57	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B <sup>2</sup>	67	66	Exterior	Residential
C <sup>2</sup>	67	66	Exterior	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E <sup>2</sup>	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A-D or F.
F	–	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	–	–	–	Undeveloped lands that are not permitted.

*(Based on Table 1 of 23 CFR Part 772)*  
<sup>1</sup> The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.  
<sup>2</sup> Includes undeveloped lands permitted for this activity category.

*Note:* FDOT defines that a substantial noise increase occurs when the existing noise level is predicted to be exceeded by 15 decibels or more as a result of the transportation improvement project. When this occurs, the requirement for abatement consideration will be followed.

**Table 18-4 Type I Project Matrix**

<b>Type I Project Activities (Noise Study Required)</b>		<b><u>Not</u> Type I (No Noise Study Required)</b>
1	Construction of highway on new location.	
2	New or relocated interchanges.	
3	Addition of new interchange ramps (add a ramp where no ramps existed). Viewed as a new location.	
4	Relocation of an interchange ramp where the edge of the outside lane on any segment of the ramp reduces the distance to the closest receptor by one-half. (See #6 for realignment of ramps.)	
5	Increasing capacity to an existing on or off interchange ramp (by adding lanes) including associated merge lanes. Viewed as a new location.	
6	Lengthening an existing interchange ramp's acceleration or deceleration lane and associated merging into the mainline to a total of more than 2,500 feet (from the gore to the end of the lane), or re-aligning where any segment of the ramp reduces the distance to the closest receptor by one-half.	Lengthening an existing interchange ramp's acceleration or deceleration lane and associated merging into the mainline (total length less than 2,500 feet), or re-aligning where any segment of the ramp DOES NOT REDUCE the distance to the closest receptor by one-half.
7	Alteration of the horizontal alignment of an existing highway such that the edge of the outside lane reduces the distance to the closest receptor by one-half.	Alteration of the horizontal alignment of an existing highway such that the edge of the outside lanes DOES NOT REDUCE the distance to the closest receptor by one-half.
8	Alteration of the vertical alignment, or the surrounding topography, where existing shielding is removed and the line of sight between the noise source and the receptor is now direct. (Activity does not include removal of vegetation).	
9	Addition of new through-lanes that increase capacity to an existing highway. (Noise analysis required on both sides of the highway whether the lanes are all in one direction or both directions of travel.)	
10	Restriping existing pavement to add a through-lane or auxiliary lane. (See #13 and #14 for auxiliary lanes.)	
11	Addition of new or substantially altered weight station, rest stop, ride share lot or toll plaza.	
12	Addition of ramps or new lanes serving as climbing lanes for buses and trucks.	
13	Addition of auxiliary lanes used as through lanes on local roads.	
14	Auxiliary lanes on freeways and expressways connecting two or more interchanges. (continuous lanes longer than 2,500 feet from gore to gore.)	Auxiliary lanes on freeways and expressways connecting two closely spaced interchanges (less than 2,500 feet from gore to gore) to accommodate weaving traffic.
15		Turn lanes at intersections associated with arterial highways.
16		Bicycle and pedestrian paths.
17		Safety activities. (23 U.S.C. § 402.)
18		Landscaping.
19		Installation of fencing, signs, pavement marking, small passenger shelters, traffic signals, or railroad warning signals (that don't disrupt traffic patterns.)
20		Deployment of electronics, photonics, communications, or information processing to improve safety and security.
21		Re-surfacing, restoration, rehabilitation, or reconstruction of an existing facility (unless there is a change in horizontal or vertical alignment per 7 & 8 above.)
22		Electronic toll collection facilities that do not disrupt traffic patterns.