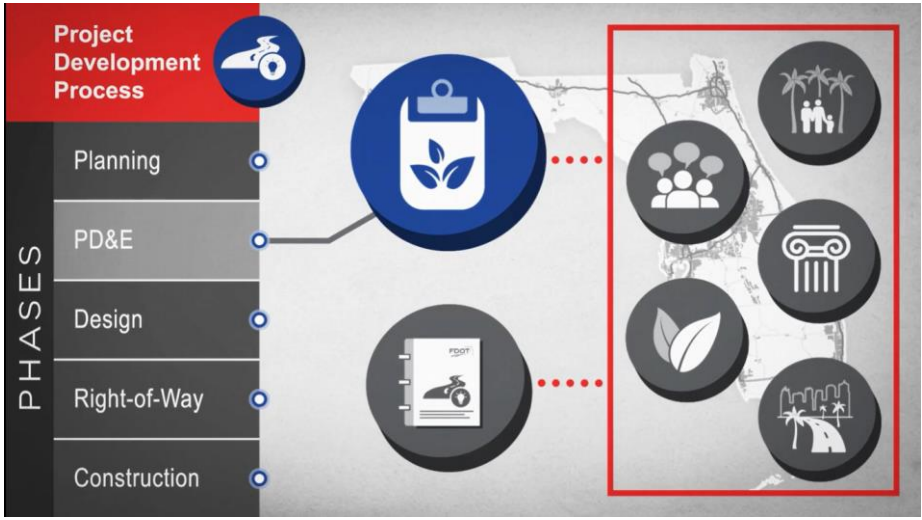
Environmental Training
for Florida Turnpike Enterprise

Traffic Noise



August 2020

The environmental review, consultation, and other actions required by applicable federal environmental laws described in this training are carried out by FDOT pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated December 14, 2016 executed by FHWA and FDOT.

Background

- ***Title 23 of the Code of Federal Regulations (CFR) Part 772*** **and applicable state laws**. For projects which require a reevaluation of PD&E
- Effective control of traffic noise requires:
  - the control of land use planning next to highways, and
  - reasonable and feasible abatement associated with highway projects.

Definitions

- **Benefited Receptor** – the recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dB(A)
- **Date of Public Knowledge** – the approval date of the environmental document
- **Noise Reduction Design Goal** – the optimum desired dB(A) noise reduction (insertion loss) determined from 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 Noise Reduction Design Goal for one (1) or more benefited receptors.
- **Statement of Likelihood** - A statement provided in both the Noise Study Report (NSR) and Environmental Document based on the feasibility and reasonableness analysis completed at the time the Environmental Document is being approved.

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Applicability

- Type I:
  - A highway construction project (new location or physical alteration of existing highway) which substantially changes horizontal and vertical alignment, profile or adds number of through lanes (adds capacity).
- Type II:
  - A federal, federal-aid, or state funded highway project for noise abatement on an existing highway. Type II projects are commonly referred to as retrofit projects and are allowed (but not mandatory) under 23 CFR Part 772. (**Florida doesn't have a Type II program**.)
- Type III:
  - A project that does not meet the classifications of a Type I or Type II. Type III projects do not require a noise analysis.

- 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.

Procedure

- A preliminary review of potential noise impacts associated with a project is conducted during ETDM screening and prior to the PD&E phase.
  - Determine if noise sensitive receptors are or may be located within the project area
  - Possibility of impact
  - Includes assessment of land use plans, field reviews, aerials, modeling
- PM coordinates with the District Noise Specialist

Traffic Noise Impacts

- Occur when the modeled future highway traffic noise levels for the worse case noise condition (usually LOS C) approach or exceeds the NAC
  - Noise Abatement Criteria (NAC) established by 23 CFR 772
- FDOT has determined that the NAC is approached when it is within 1 dB(A) of the appropriate NAC and substantial increase occurs when the increase over existing conditions is 15 dB(A) or greater.
- If one or more noise sensitive receptors are impacted, then abatement measures must be considered.

Traffic Noise Prediction

- Traffic noise analysis shall be completed for the alternative(s) under detailed study and for each Activity Category of the NAC shown in Figure 18-1 (of the PD&E Manual) present in the study area
- Noise level predictions are required for the following project alternatives and study years:

Alternative	Year
No-Build	Existing and design year
Build	Design year only

- Traffic Noise Model (*FWHA TNM*)

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Noise Descriptor

- Level Equivalent (Leq)
  - The noise level descriptor used by FDOT
  - 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
- Leq(h) – hourly value of Leq
  - L10(h) in metric
  - FDOT uses the Leq(h) metric

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Noise Abatement Evaluation

- When traffic noise impacts are identified, noise abatement shall be considered and evaluated for feasibility and reasonableness.
- FDOT shall 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.
- FDOT gives primary consideration to exterior areas where frequent human use occurs.
- At a minimum, FDOT considers noise abatement in the form of a noise barrier when a traffic noise impact is identified

Feasibility

- Involve noise reduction and engineering considerations
- Ability of the noise barrier to provide a reduction of at least 5 dB(A) to impacted receptors
- Cost, visual impact and other factors are not unreasonable
- Receptor is not considered benefited if a minimum of 5 dB(A) reduction cannot be achieved
- Number of impacted receptors required to achieve a 5 dB(A) reduction or greater for a barrier to be considered feasible will be 2 or greater.
- Design, construction, safety, access, ROW, drainage, utilities
- Additional cost solely to accommodate construction of a noise barrier should be included in the cost reasonableness evaluation

Safety Factors

- Primary consideration is given to safety
  - Ex.: Sight distance at an intersection or driveway
- Maximum Heights
  - Ground mounted noise barriers: 22 ft
  - On bridge and retaining wall structures: 8 ft.
  - Ground mounted Traffic Railing/Noise Barrier combinations: 14 ft.

Reasonableness Factors

- Determined once the abetment measure is determined to be feasible
- Reasonableness:
  - Consideration of the viewpoints of the benefitted property owners and residents
    - During a noise abatement workshop
  - Cost effectiveness of the traffic noise abetment measure
  - Achievement of the FDOT noise reduction design goal

Cost Effectiveness

- 1,400 SF of noise barrier / benefitted receptor at a reasonable cost
- Unit cost: $30 / SF
- Reasonable cost: $42,000 per benefitted receptor
- Only include benefitted receptors
- Calculation of the cost effectiveness considers:
  1. Cost of materials and labor
  2. Cost of additional ROW
  3. Cot of new or upgraded drainage structures
  4. Relocation of utilities outside of FDOT ROW (not included in the cost effectiveness calculations for the noise barrier)
- Determined during the PD&E study
- Make a statement of likelihood in the environmental document to pursue in the design phase.
- Subject to a detailed review in design and subsequent re-evaluations.

Noise Study Report (NSR)

- Documents the results of the noise analysis
- Summarized in the Environmental Document
- Coordination / communications summarized
- When the Environmental Document is approved, send copies of the NSR to local government officials within whose jurisdiction the project is located
- After the Date of Public Knowledge:
  - FDOT is no longer responsible for providing noise abatement to new development which occurs adjacent to the proposed highway project

Documentation in the PD&E Phase

- Identify:
  - Statement of Likelihood for feasible and reasonable measures of abatement
  - Noise impacts for which no noise abatement measures are feasible and reasonable
- Nosie abatement is analyzed during the PD&E phase and during final design, prior to Plans, Specifications and Estimates (PS&E)

Statements in the Environmental Document

- No impacted receptors:
  - *Based on the noise analyses performed to date, there appear to be no impacted areas within the project that require abatement consideration.*
- Noise impacted areas requiring abatement consideration, in accordance with 23 CFR Part 772:
  - *"The FDOT is committed to the construction of feasible and reasonable noise abatement measures at the noise-impacted locations identified in (reference to table or figure) contingent upon the following conditions…"*
- No feasible or reasonable abatement is identified:
  - *Based on the noise analyses performed to date, there are no feasible solutions available to mitigate the noise impacts at the locations identified in (insert a table or figure which shows proposed location and physical description of noise abatement measures determined not feasible or reasonable).*

Documentation in the Design Phase

- Noise abatement locations, noise barrier types, lengths and height are determined
- Final noise abatement commitments are documented in the re-evaluation and the NSR Addendum prior to construction advertisement
- Design PM collects all PD&E noise abatement commitments and NSR