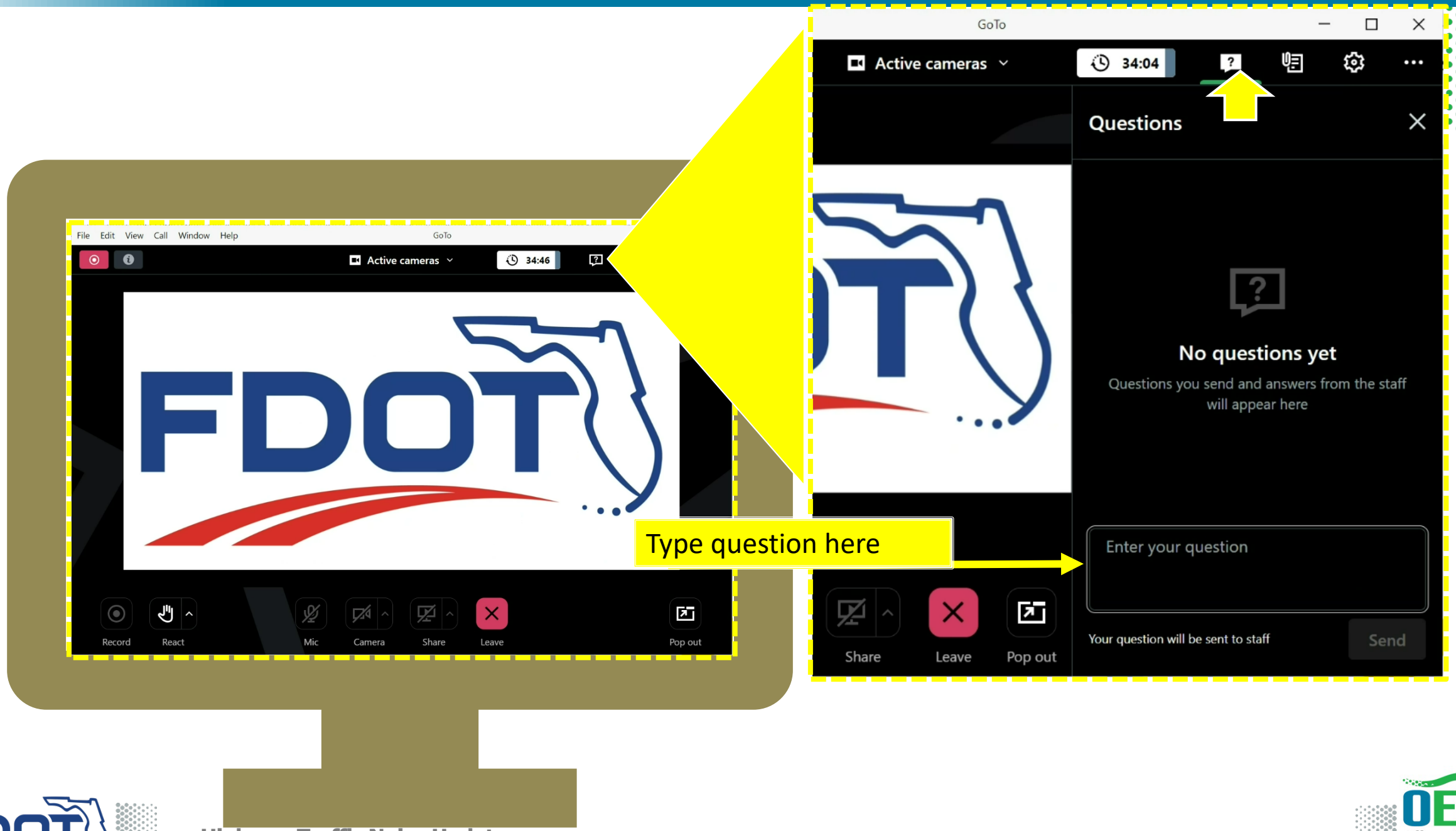
Office of Environmental Management

Highway Traffic Noise Updates:

A Look at New Noise Policies, Tools and Resources

June 24, 2025

FDOT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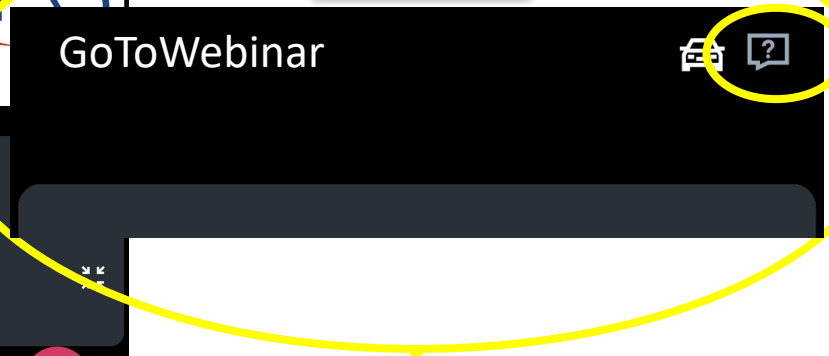
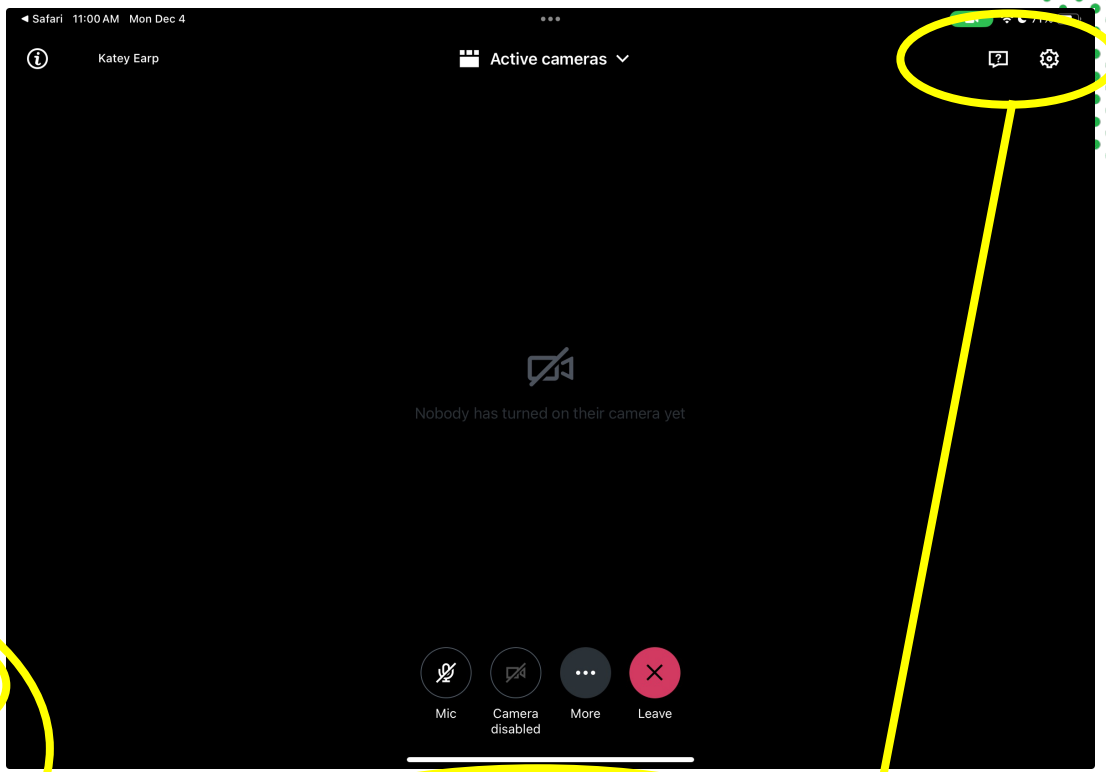
CONTROL PANEL – Mobile/Tablet

Mobile





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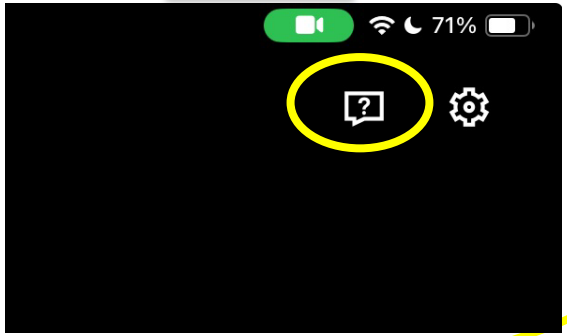
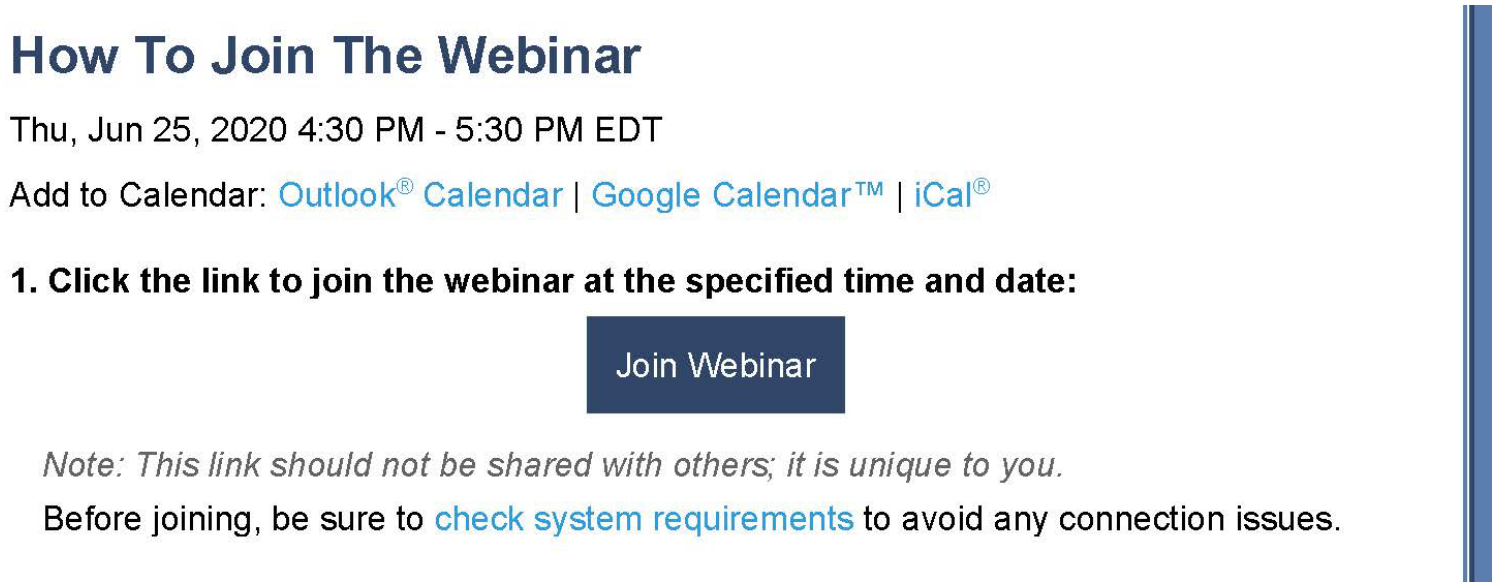


Type question here

For technical issues, visit GoToWebinar online at:

Support.goto.com

Or through your confirmation email, click on check system requirements (below):



How To Join The Webinar

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Join Webinar

Note: This link should not be shared with others; it is unique to you.

Before joining, be sure to check system requirements to avoid any connection issues.

Introduction

Speaker - Cristina Schoonard

- Over 15 years of experience specializing in highway traffic noise, contamination, air quality, water quality, and other environmental analyses in both private and public sectors
- Responsible for Highway Traffic Noise analyses, contamination assessments, and air quality modeling analyses for various Department of Transportation (DOT) offices, including Florida, Texas, Michigan, Nevada, North Carolina, Georgia, and more.
- Provides highway traffic noise support to Florida's DOT Office of Environmental Management (OEM)


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LESSON 1
Introduction: What is New?

Introduction

- FDOT OEM Highway Traffic Noise Website
- PD&E NSR Template
- Traffic Data Spreadsheet
- Special Land Use Methodology
- Existing Noise Barrier Methodology
- PD&E Manual Updates (2024)

LESSON 2
FDOT Office of Environmental Management (OEM) Highway Traffic Noise Website

FDOT OEM
Highway Traffic Noise Website

https://www.fdot.gov/environment/highway-traffic-noise

- FDOT has developed a Highway Traffic Noise Website
  - Highway Traffic Noise Process Overview
  - Technical Analysis
  - Tools and Resources
  - Noise Policy and Guidance References
  - Templates and Spreadsheets

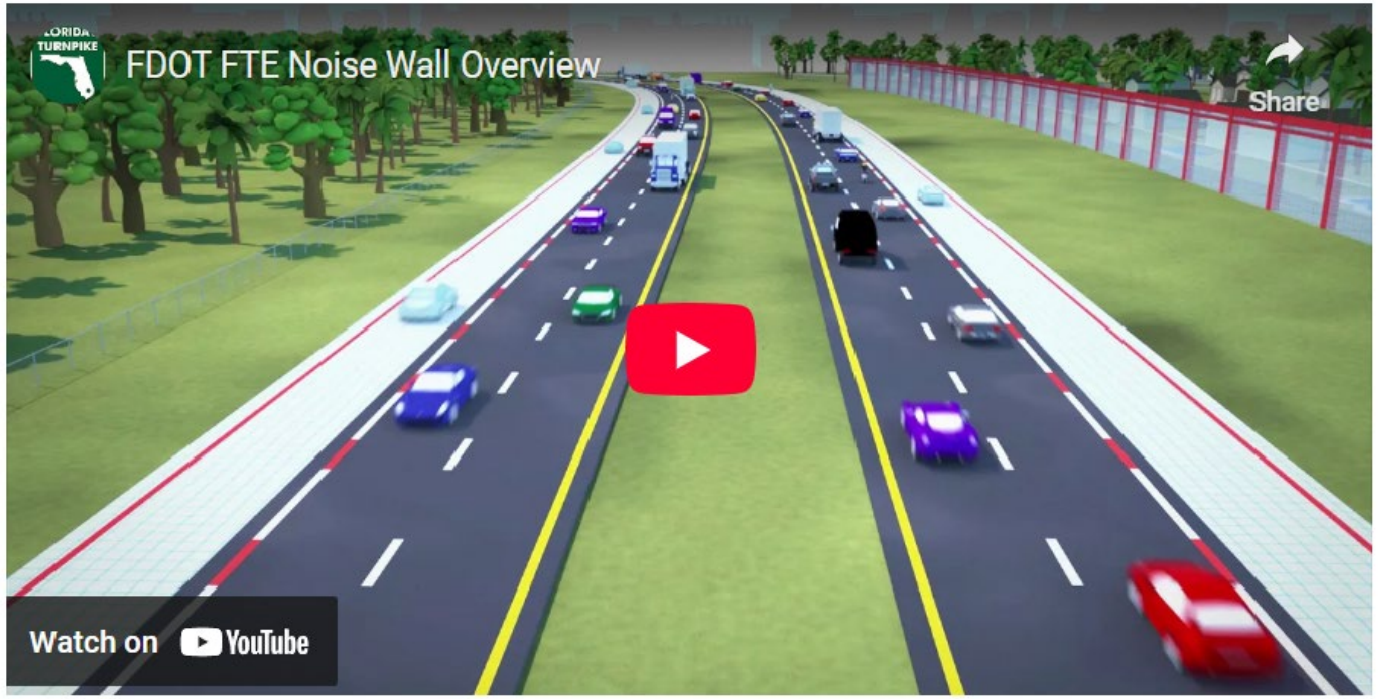
FDOT OEM
Highway Traffic Noise Website

- A 5-minute video
- Lifecycle of evaluating noise
  - Modeling (TNM)
  - Noise Measurements
  - Evaluating Acoustics, Financial and Engineering Requirements and needs
  - Public input and surveys
  - The Date of Public Knowledge

HOW HIGHWAY TRAFFIC NOISE IS EVALUATED

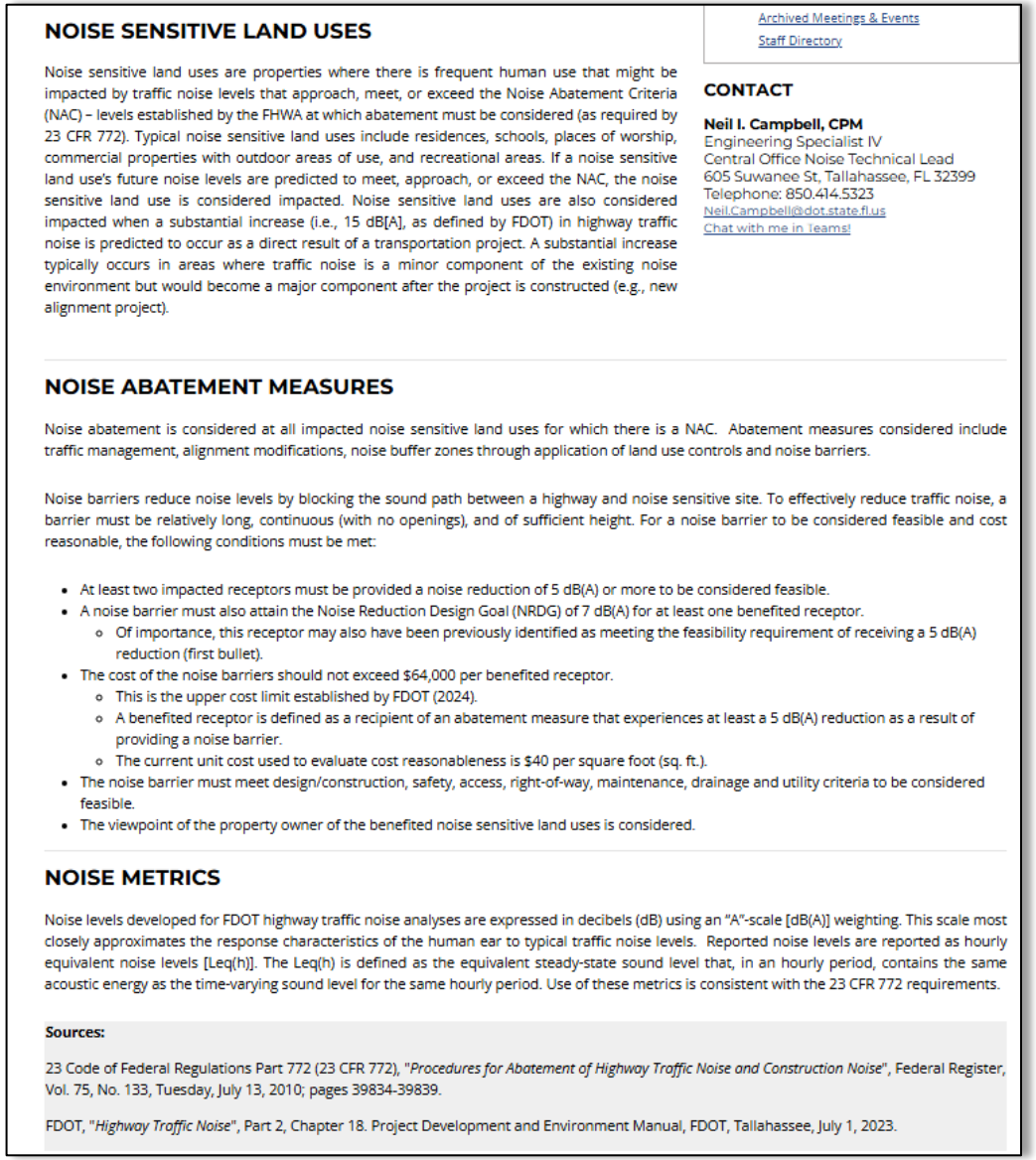
This video, "Understanding Highway Traffic Noise Policy and Procedure", was developed by Florida's Turnpike Enterprise (FTE) to describe how traffic noise impacts are studied and evaluated for transportation projects, as well as explains how to determine if noise walls could provide mitigation and meet applicable qualifying criteria.

FREQUENTLY ASKED QUESTIONS



FDOT OEM
Highway Traffic Noise Website

- Highway Traffic Noise Process Overview
  - Noise Sensitive Land Uses
  - Noise Abatement Measures
  - Noise Metrics
- Contact information for Neil Campbell, CPM



Archived Meetings & Events
Staff Directory

NOISE SENSITIVE LAND USES

Noise sensitive land uses are properties where there is frequent human use that might be impacted by traffic noise levels that approach, meet, or exceed the Noise Abatement Criteria (NAC) – levels established by the FHWA at which abatement must be considered (as required by 23 CFR 772). Typical noise sensitive land uses include residences, schools, places of worship, commercial properties with outdoor areas of use, and recreational areas. If a noise sensitive land use's future noise levels are predicted to meet, approach, or exceed the NAC, the noise sensitive land use is considered impacted. Noise sensitive land uses are also considered impacted when a substantial increase (i.e., 15 dB[A], as defined by FDOT) in highway traffic noise is predicted to occur as a direct result of a transportation project. A substantial increase typically occurs in areas where traffic noise is a minor component of the existing noise environment but would become a major component after the project is constructed (e.g., new alignment project).

CONTACT

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Neil.Campbell@dot.state.fl.us
Chat with me in Teams!

NOISE ABATEMENT MEASURES

Noise abatement is considered at all impacted noise sensitive land uses for which there is a NAC. Abatement measures considered include traffic management, alignment modifications, noise buffer zones through application of land use controls and noise barriers.

Noise barriers reduce noise levels by blocking the sound path between a highway and noise sensitive site. To effectively reduce traffic noise, a barrier must be relatively long, continuous (with no openings), and of sufficient height. For a noise barrier to be considered feasible and cost reasonable, the following conditions must be met:

- At least two impacted receptors must be provided a noise reduction of 5 dB(A) or more to be considered feasible.
- A noise barrier must also attain the Noise Reduction Design Goal (NRDG) of 7 dB(A) for at least one benefited receptor.
  - Of importance, this receptor may also have been previously identified as meeting the feasibility requirement of receiving a 5 dB(A) reduction (first bullet).
- The cost of the noise barriers should not exceed $64,000 per benefited receptor.
  - This is the upper cost limit established by FDOT (2024).
  - 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 noise barrier must meet design/construction, safety, access, right-of-way, maintenance, drainage and utility criteria to be considered feasible.
- The viewpoint of the property owner of the benefited noise sensitive land uses is considered.

NOISE METRICS

Noise levels developed for FDOT highway traffic noise analyses are expressed in decibels (dB) using an "A"-scale [dB(A)] weighting. This scale most closely approximates the response characteristics of the human ear to typical traffic noise levels. Reported noise levels are reported as hourly equivalent noise levels [Leq(h)]. The Leq(h) is defined as the equivalent steady-state sound level that, in an hourly period, contains the same acoustic energy as the time-varying sound level for the same hourly period. Use of these metrics is consistent with the 23 CFR 772 requirements.

Sources:

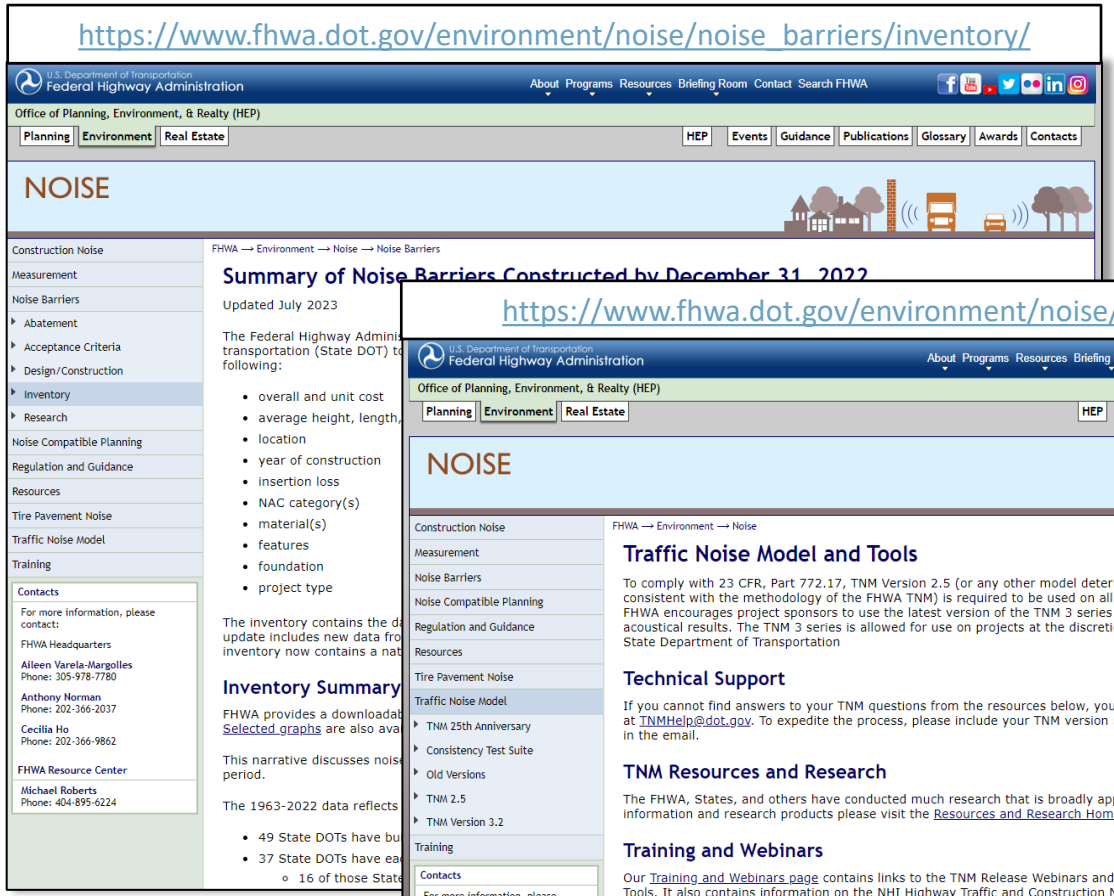
23 Code of Federal Regulations Part 772 (23 CFR 772), "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*", Federal Register, Vol. 75, No. 133, Tuesday, July 13, 2010; pages 39834-39839.

FDOT, "*Highway Traffic Noise*", Part 2, Chapter 18. Project Development and Environment Manual, FDOT, Tallahassee, July 1, 2023.

FDOT OEM
Highway Traffic Noise Website

- **FDOT website provides links to:**
  - Noise Barrier Inventory
    - Overall and unit cost
    - Average height, length, area
    - Location
    - Year of construction
    - Insertion loss
    - NAC category(s)
    - Material(s)
    - Features
    - Foundation
    - Project type
  - FHWA Traffic Noise Model
    - Version 2.5

https://www.fhwa.dot.gov/environment/noise/noise_barriers/inventory/



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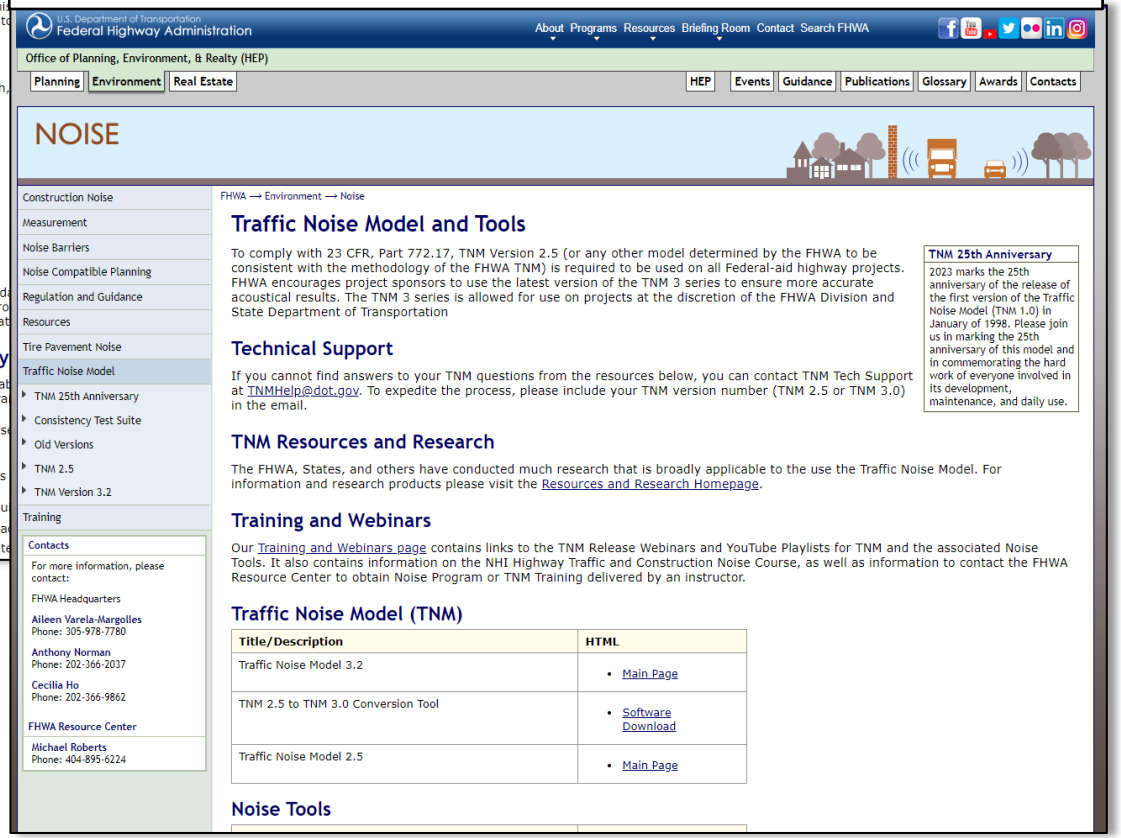
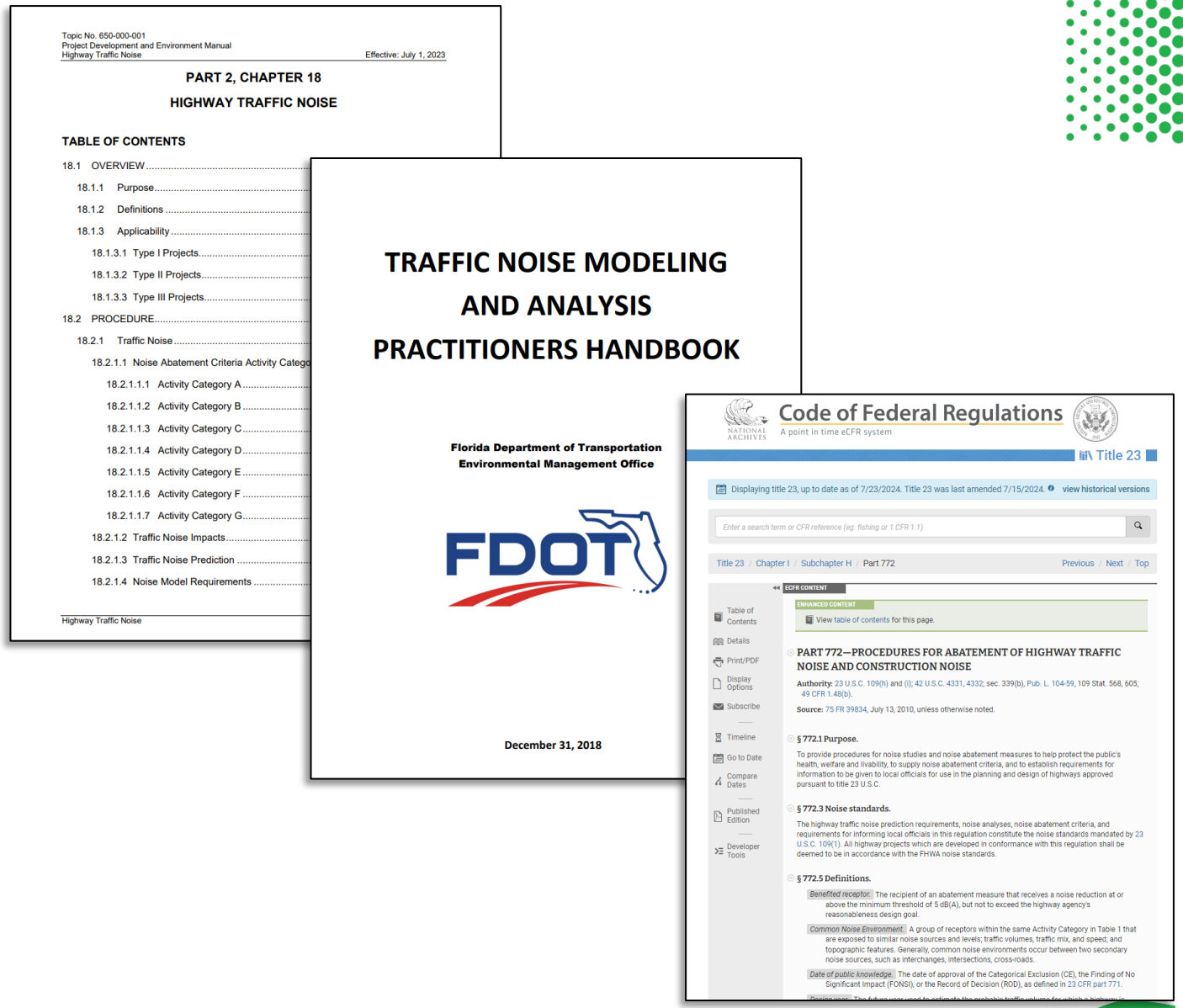


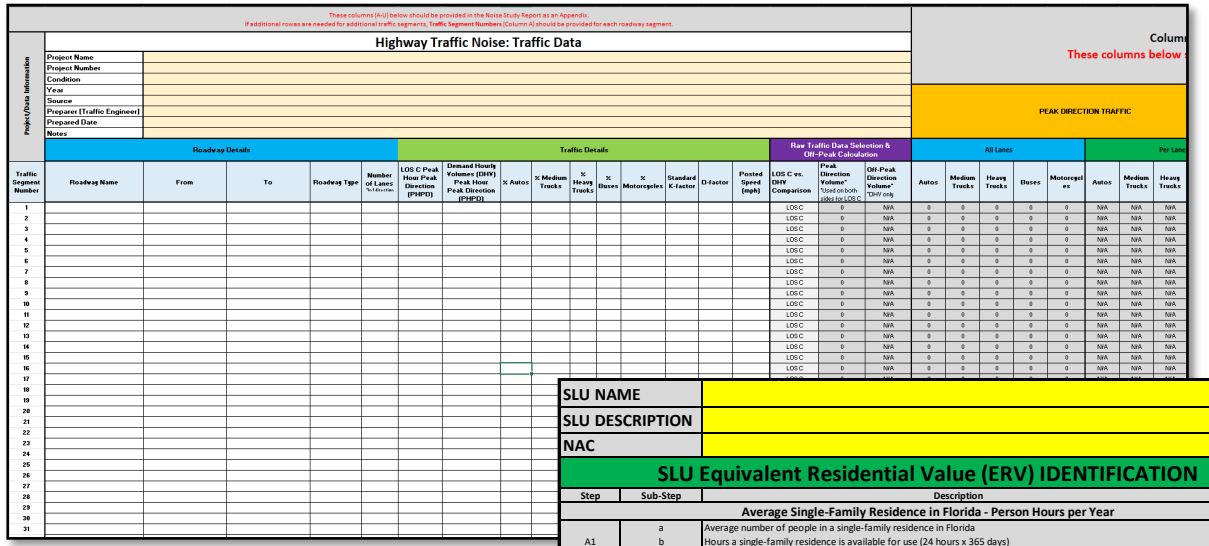
FDOT OEM
Highway Traffic Noise Website

- **Noise Policy and Guidance**
  - FDOT PD&E Manual, Chapter 18
  - FDOT Traffic Noise Modeling and Analysis Practitioner's Handbook
  - FDOT's Methodology to Evaluate Highway Traffic Noise at Special Land Uses
  - FDOT's Existing Noise Barrier Methodology
  - FHWA 23 CFR Part 772
  - FHWA Highway Traffic Noise: Analysis and Abatement Guidance
  - FHWA Noise Measurement Handbook
  - FHWA Noise Measurement Field Guide
  - FHWA Noise Barrier Design Handbook
  - FHWA Consideration of Existing Noise Barrier in a Type I Noise Analysis
  - FDOT Quality/Level of Service Handbook
  - FDOT Standard Specifications Library
  - FHWA Highway Construction Noise Handbook



FDOT OEM
Highway Traffic Noise Website

- **Templates and Spreadsheets**
  - FDOT SLU Worksheet
  - FDOT Traffic Data for Traffic Noise Spreadsheet
  - FDOT PD&E Noise Study Report Template



Highway Traffic Noise: Traffic Data

Project Information	
Project Name	
Project Number	
Condition	
Year	
Source	
Preparer (Traffic Engineer)	
Prepared Date	
Notes	

Traffic Segment Number	Roadway Name	From	To	Roadway Type	Number of Lanes	LOS C Peak Hour Peak Direction (PHPD)	Demand Hourly Volumes (DHV) Peak Hour Peak Direction (PHPD)	% Autos	% Medium Trucks	% Heavy Trucks	% Buses	% Motorcycles	Standard K-factor	D-factor	Posted Speed (mph)	LOS C vs. DHV Comparison	Peak Direction Volume*	Off-Peak Direction Volume*	All Lanes: Autos	All Lanes: Medium Trucks	All Lanes: Heavy Trucks	All Lanes: Buses	All Lanes: Motorcycles	Per Lane: Autos	Per Lane: Medium Trucks	Per Lane: Heavy Trucks
1																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
2																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
3																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
4																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
5																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
6																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
7																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
8																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
9																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
10																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
11																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
12																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
13																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
14																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
15																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
16																LOS C	0	N/A	0	0	0	0	0	N/A	N/A	N/A
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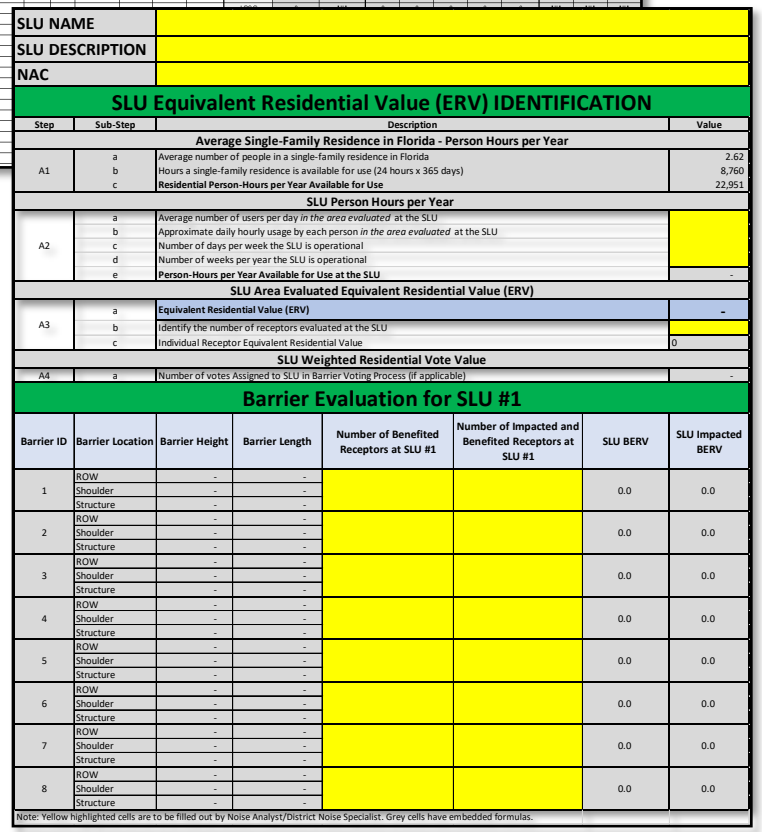


SLU NAME	
SLU DESCRIPTION	
NAC	

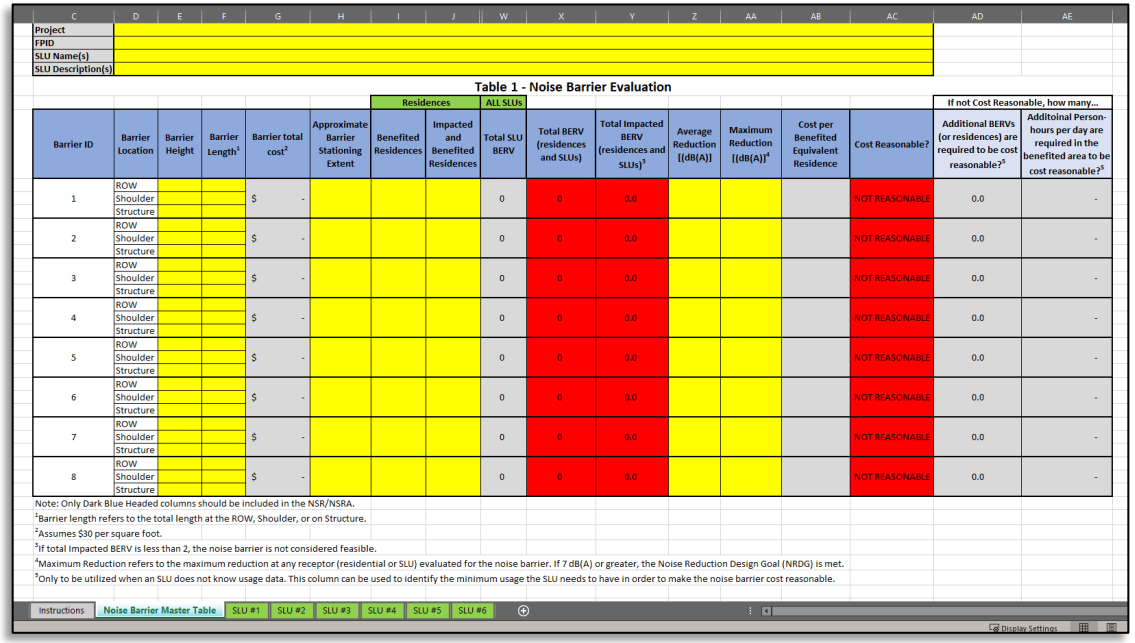
SLU Equivalent Residential Value (ERV) IDENTIFICATION

Step	Sub-Step	Description	Value
		Average Single-Family Residence in Florida - Person Hours per Year	
A1	a	Average number of people in a single-family residence in Florida	2.62
	b	Hours a single-family residence is available for use (24 hours x 365 days)	8,760
	c	**Residential Person-Hours per Year Available for Use**	22,951
		SLU Person Hours per Year	
A2	a	Average number of users per day *in the area evaluated* at the SLU	
	b	Approximate daily hourly usage by each person *in the area evaluated* at the SLU	
	c	Number of days per week the SLU is operational	
	d	Number of weeks per year the SLU is operational	
	e	**Person-Hours per Year Available for Use at the SLU**	-
		SLU Area Evaluated Equivalent Residential Value (ERV)	
A3	a	**Equivalent Residential Value (ERV)**	-
	b	Identify the number of receptors evaluated at the SLU	
	c	Individual Receptor Equivalent Residential Value	0
		SLU Weighted Residential Vote Value	
A4	a	Number of votes Assigned to SLU in Barrier Voting Process (if applicable)	-

Barrier Evaluation for SLU #1

Barrier ID	Barrier Location	Barrier Height	Barrier Length	Number of Benefited Receptors at SLU #1	Number of Impacted and Benefited Receptors at SLU #1	SLU BERV	SLU Impacted BERV
1	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
2	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
3	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
4	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
5	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
6	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
7	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
8	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				

Note: Yellow highlighted cells are to be filled out by Noise Analyst/District Noise Specialist. Grey cells have embedded formulas.



Project	
FPID	
SLU Name(s)	
SLU Description(s)	

Table 1 - Noise Barrier Evaluation

Barrier ID	Barrier Location	Barrier Height	Barrier Length[1]	Barrier total cost[2]	Approximate Barrier Stationing Extent	Residences: Benefited Residences	Residences: Impacted and Benefited Residences	ALL SLUs: Total SLU BERV	Total BERV (residences and SLUs)	Total Impacted BERV (residences and SLUs)[3]	Average Reduction [(dB(A)]	Maximum Reduction [(dB(A)][4]	Cost per Benefited Equivalent Residence	Cost Reasonable?	If not Cost Reasonable, how many... Additional BERVs (or residences) are required to be cost reasonable?[5]	If not Cost Reasonable, how many... Additoinal Person-hours per day are required in the benefited area to be cost reasonable?[5]
1	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
2	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
3	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
4	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
5	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
6	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
7	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															
8	ROW			$ -				0	0	0.0				NOT REASONABLE	0.0	-
	Shoulder															
	Structure															

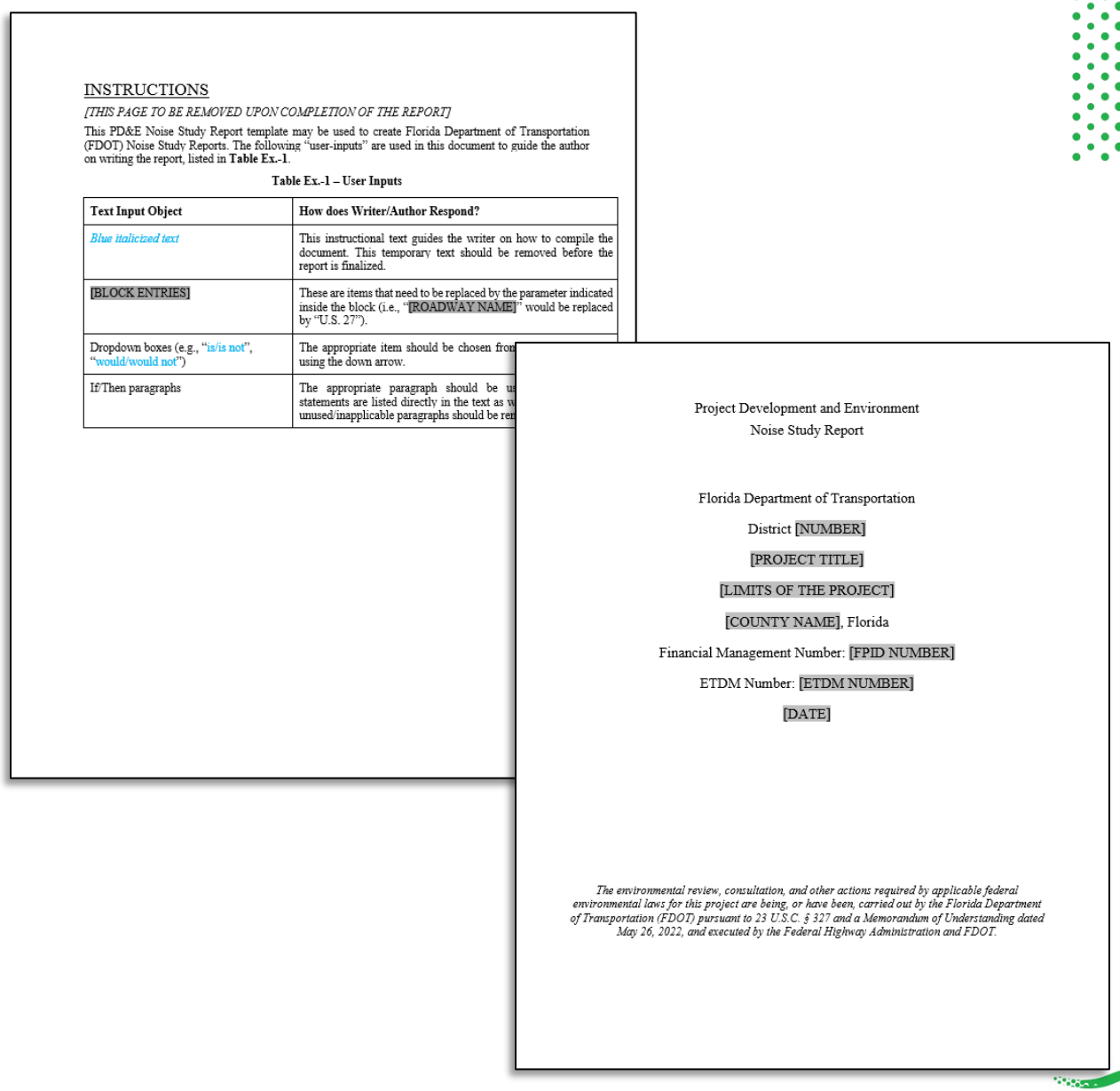
Note: Only Dark Blue Headed columns should be included in the NSR/NSRA.
[1]Barrier length refers to the total length at the ROW, Shoulder, or on Structure.
[2]Assumes $30 per square foot.
[3]If total Impacted BERV is less than 2, the noise barrier is not considered feasible.
[4]Maximum Reduction refers to the maximum reduction at any receptor (residential or SLU) evaluated for the noise barrier. If 7 dB(A) or greater, the Noise Reduction Design Goal (NRDG) is met.
[5]Only to be utilized when an SLU does not know usage data. This column can be used to identify the minimum usage the SLU needs to have in order to make the noise barrier cost reasonable.

Instructions | Noise Barrier Master Table | SLU #1 | SLU #2 | SLU #3 | SLU #4 | SLU #5 | SLU #6

LESSON 3
Project, Development and Environment (PD&E) Noise Study Report Template

PD&E Noise Study Report Template

- A PD&E Noise Study Report template was developed
- Not a required template
- Suggested language
- Guided Steps
  - Instructions
  - Block entries
  - Dropdown Boxes
  - If/Then paragraphs
- Design Noise Study Report template in progress



INSTRUCTIONS

[THIS PAGE TO BE REMOVED UPON COMPLETION OF THE REPORT]

This PD&E Noise Study Report template may be used to create Florida Department of Transportation (FDOT) Noise Study Reports. The following "user-inputs" are used in this document to guide the author on writing the report, listed in **Table Ex.-1**.

Table Ex.-1 – User Inputs

Text Input Object	How does Writer/Author Respond?
Blue italicized text	This instructional text guides the writer on how to compile the document. This temporary text should be removed before the report is finalized.
[BLOCK ENTRIES]	These are items that need to be replaced by the parameter indicated inside the block (i.e., "[ROADWAY NAME]" would be replaced by "U.S. 27").
Dropdown boxes (e.g., "is/is not", "would/would not")	The appropriate item should be chosen fro using the down arrow.
If/Then paragraphs	The appropriate paragraph should be u statements are listed directly in the text as w unused/inapplicable paragraphs should be re

Project Development and Environment
Noise Study Report

Florida Department of Transportation

District [NUMBER]

[PROJECT TITLE]

[LIMITS OF THE PROJECT]

[COUNTY NAME], Florida

Financial Management Number: [FPID NUMBER]

ETDM Number: [ETDM NUMBER]

[DATE]

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

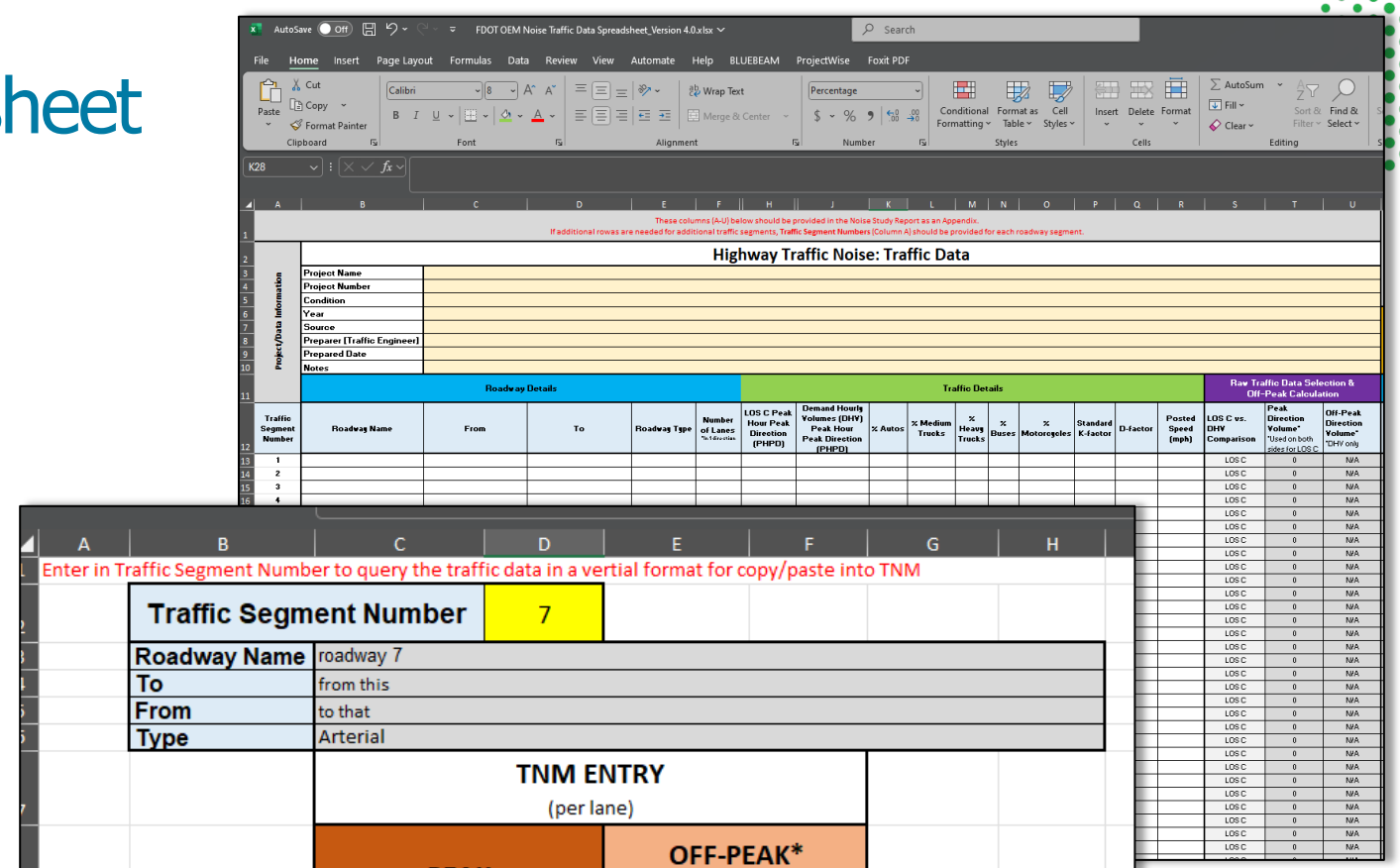
PD&E Noise Study Report Template

Let’s take a peek at the document…

LESSON 4
Traffic Data Spreadsheet

FDOT OEM Traffic Data Spreadsheet

- FDOT OEM has developed a standardized Noise traffic data spreadsheet
- Spreadsheet is provided to Traffic engineer to provide the Raw Traffic Data
- Post-Processes traffic data received from the Traffic engineer to be TNM-Ready values
- Creates a table that is easily inserted into the Noise Study Report
- **Required to be submitted alongside TNM files to FDOT**



FDOT OEM Traffic Data Spreadsheet

- Easy to copy data into TNM
  - TNM-order
  - Volumes stacked vertically alongside speed data

Enter in Traffic Segment Number to query the traffic data in a vertial format for copy/paste into TNM

Traffic Segment Number	7
Roadway Name	roadway 7
To	from this
From	to that
Type	Arterial

	TNM ENTRY (per lane)			
	PEAK		OFF-PEAK* *Only to be used with Demand values, not LOS C	
	Volume	Speed	Volume	Speed
Automobiles	500	55	N/A	55
Medium Trucks	11	55	N/A	55
Heavy Trucks	17	55	N/A	55
Buses	6	55	N/A	55
Motorcycles	6	55	N/A	55

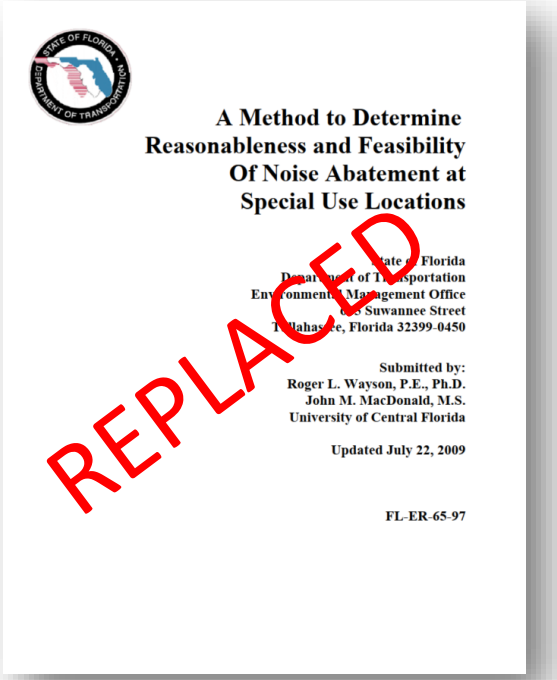
FDOT OEM Traffic Data Spreadsheet

Let’s take a peek at the spreadsheet…

LESSON 5
Special Land Use (SLU) Methodology

SLU Methodology Overview

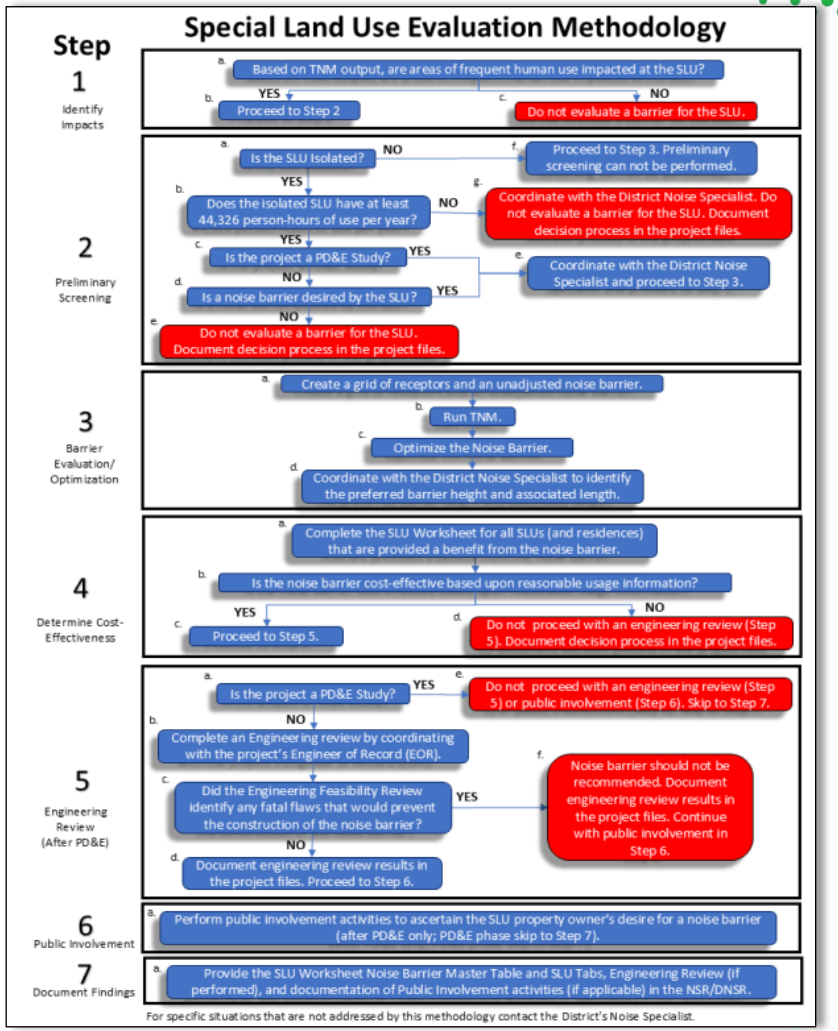
- **SLU = Special Land Use = A Non-Residential Noise Sensitive Site**
- SLUs were evaluated using the methodology outlined in the 2009 document, "*A Method to Determine Reasonableness and Feasibility of Noise Abatement at Special Land Use Locations*" (originally published in 1997; re-published in 2009)
- Over several years, several limitations of the 2009 Methodology have been identified, including:
  - The update to 23 CFR 772 (2010)
  - The separation of the evaluation of residences and non-residential land uses
  - Time-consuming
  - Lack of specific guidance on how to apply the Noise Reduction Design Goal (NRDG)
  - No example tables or table templates
- Updated methodology addresses the above issues
- This methodology replaces the 2009 methodology



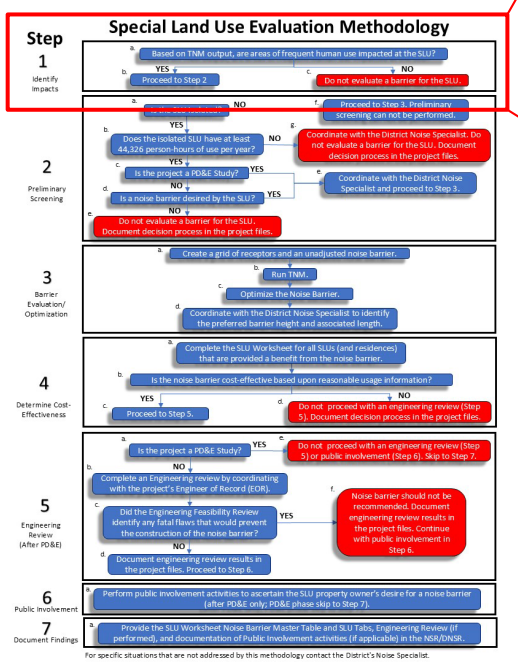
★ *Note: SLUs are non-residential noise sensitive land uses that fall into NAC Activity Categories A, C, D or E.*

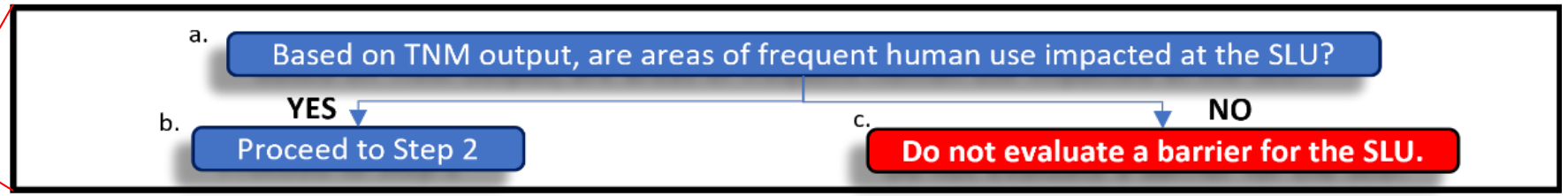
Methodology Overview

1. Identify impacts using the Federal Highway Administration's (FHWA) Traffic Noise Model (TNM)
2. Perform Preliminary Screening
3. Perform Barrier Evaluation & Optimization
4. Determine Cost Effectiveness by filling out the FDOT Reasonableness Worksheet
5. Engineering Feasibility Review
6. Public involvement
7. Document Findings



Step 1: Identify Impacts

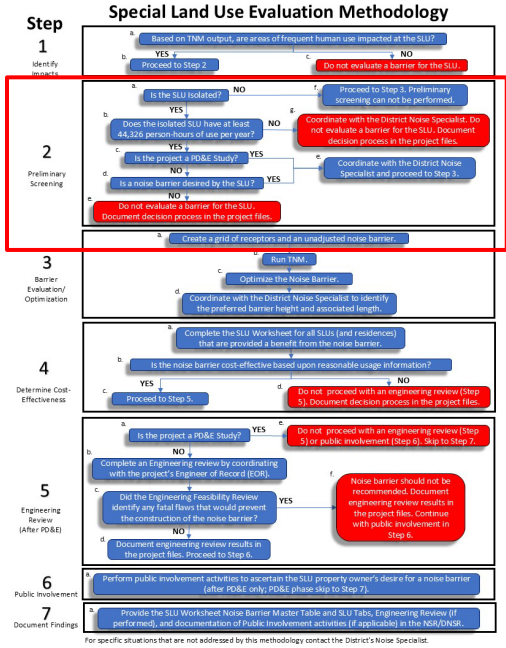


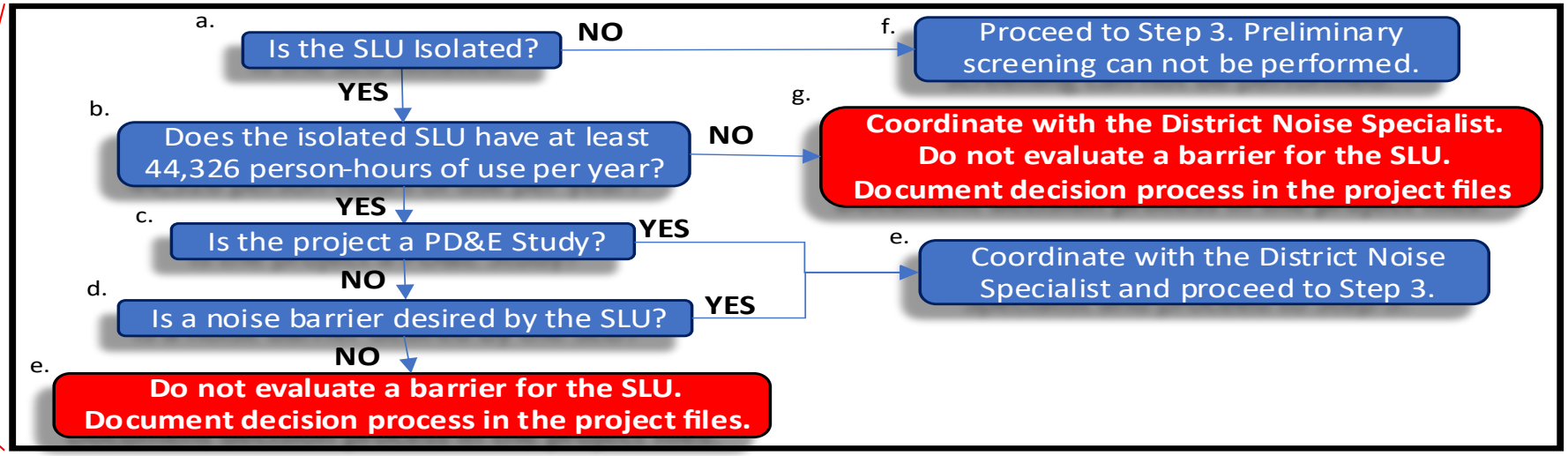


- Identify predicted noise levels using FHWA's TNM
- Follow procedures listed in 23 CFR 772 and the latest version of the FDOT PD&E Manual, Chapter 18 (*Highway Traffic Noise*)
- Impacts are based upon 23 CFR 772 criteria for each land use type
- If impacts are identified, proceed to Step 2, and inform FDOT District Noise Specialist

*Note: For PD&E phase noise studies, the existing and future no-build noise levels must also be identified

Step 2: Preliminary Screening





- Decreases evaluation time on SLUs:
  - With low usage that do not have the required usage to justify the cost of a noise barrier
  - That do not desire a noise barrier (Design Phase only)
- Screening should be utilized for isolated SLUs only
- If Preliminary Screening is not used, the SLU must follow the in-depth analysis in Steps 3-7

Step 2: Preliminary Screening – Cost-Effectiveness Screening

In summary:

- If a Special Land Use **can achieve** the minimum person-hours for a noise barrier to be considered cost-effective, a detailed noise barrier analysis should be performed using Steps 3-7
- If a Special Land Use is **unable to achieve** the minimum person hours for a noise barrier to be considered cost-effective, it should be documented in the project file and the Noise Study Report
- Coordination with the District Noise Specialist should occur

If an SLU cannot meet the minimum required hours, a noise barrier is not reasonable and should not be fully evaluated.

Step 2: Preliminary Screening – FDOT SLU Worksheet

Usage Screening - To be used for ISOLATED SLUS ONLY

An isolated SLU must have enough person-hour usage to equate to at least 2 residences to satisfy the FDOT requirement that 2 residences must be provided a benefit for a noise barrier to be found feasible.

Average Single-Family Residence in Florida - Person Hours per Year	
Average number of people in a single-family residence in Florida (US CENSUS, 2018-2022 data)	2.53
Hours a single-family residence is available for use (24 hours x 365 days)	8,760
Residential Person-Hours per Year Available for Use	22,163
Isolated SLU Person-Hours per Year	
Average number of users per day at the SLU	
Approximate daily hourly usage by each person at the SLU	
Number of Days per week the SLU is operational	
Number of weeks per year the SLU is operational	
Person-Hours per Year SLU is available for use	-
Equivalent Residence (ER)	-
Isolated SLU Eligible for Noise Barrier Evaluation?	NOT ELIGIBLE

The assumption that 2.53 persons utilize the average single-family home in Florida was obtained from the Florida Census data from 2018-2022 (https://www.census.gov/quickfacts/fact/table/FL/HSD310220).

Instructions | Preliminary Screening | Noise Barrier Master Table | SLU #1 | SLU #2 | SLU #3 | SLU #4 | SLU #5 | SLU #6

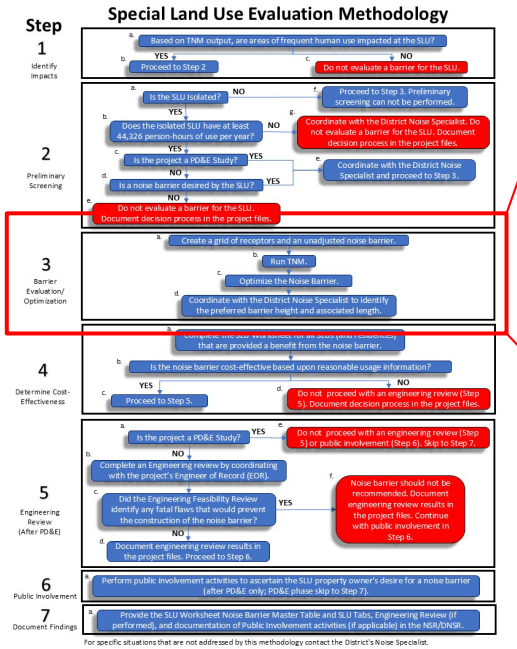
*Available on the FDOT Website at: https://www.fdot.gov/environment/documents---resources

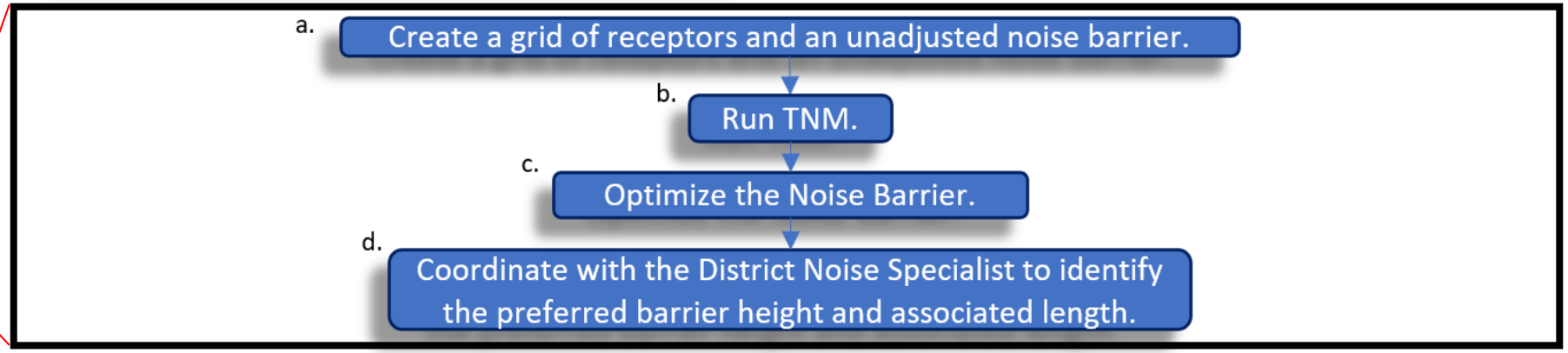
Step 2: Preliminary Screening – Viewpoint Screening

- Only during the ***Design or Design-Build Phase*** of the project
  - Not to be performed during PD&E Phases, as an engineering review has not occurred
- Inquire the SLU's viewpoint ***for or against*** a noise barrier & evaluation
- If the SLU desires the barrier to be evaluated, obtain usage information

Reach-out occurs AFTER a barrier has been determined to be feasible and reasonable

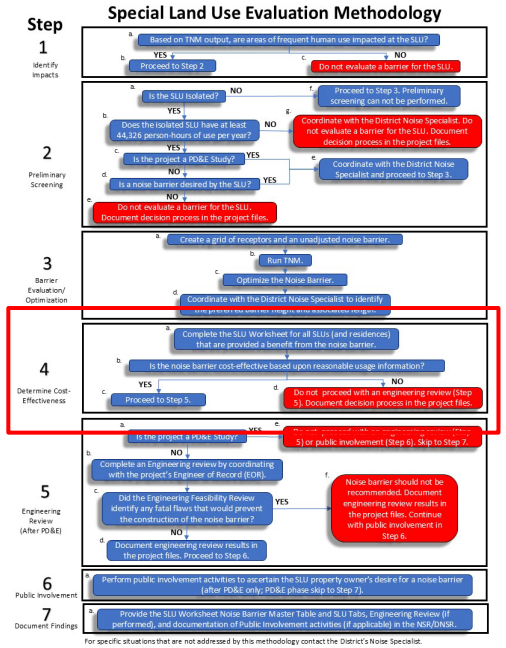
Step 3: TNM Barrier Evaluation and Optimization





- Follow instructions in the FDOT Traffic Noise Modeling & Analysis Practitioner's Handbook for optimizing a noise barrier.

Step 4: Determine Cost-Effectiveness



a. Complete the SLU Worksheet for all SLUs (and residences) that are provided a benefit from the noise barrier.

b. Is the noise barrier cost-effective based upon reasonable usage information?

YES

c. Proceed to Step 5.

NO

d. **Do not proceed with an engineering review (Step 5). Document decision process in the project files.**

Step 4: Determine Cost-Effectiveness

- Obtain usage information from SLU property owner(s)
- Complete the FDOT SLU Worksheet
  - Noise Barrier Master Table
    - Benefited Residences
  - SLU Tabs for each SLU that receives a benefit from the noise barrier
- Determine if the noise barrier is potentially feasible and reasonable

★ Note: If unreasonably high usage data is provided by the SLU, the District Noise Specialist should be consulted.

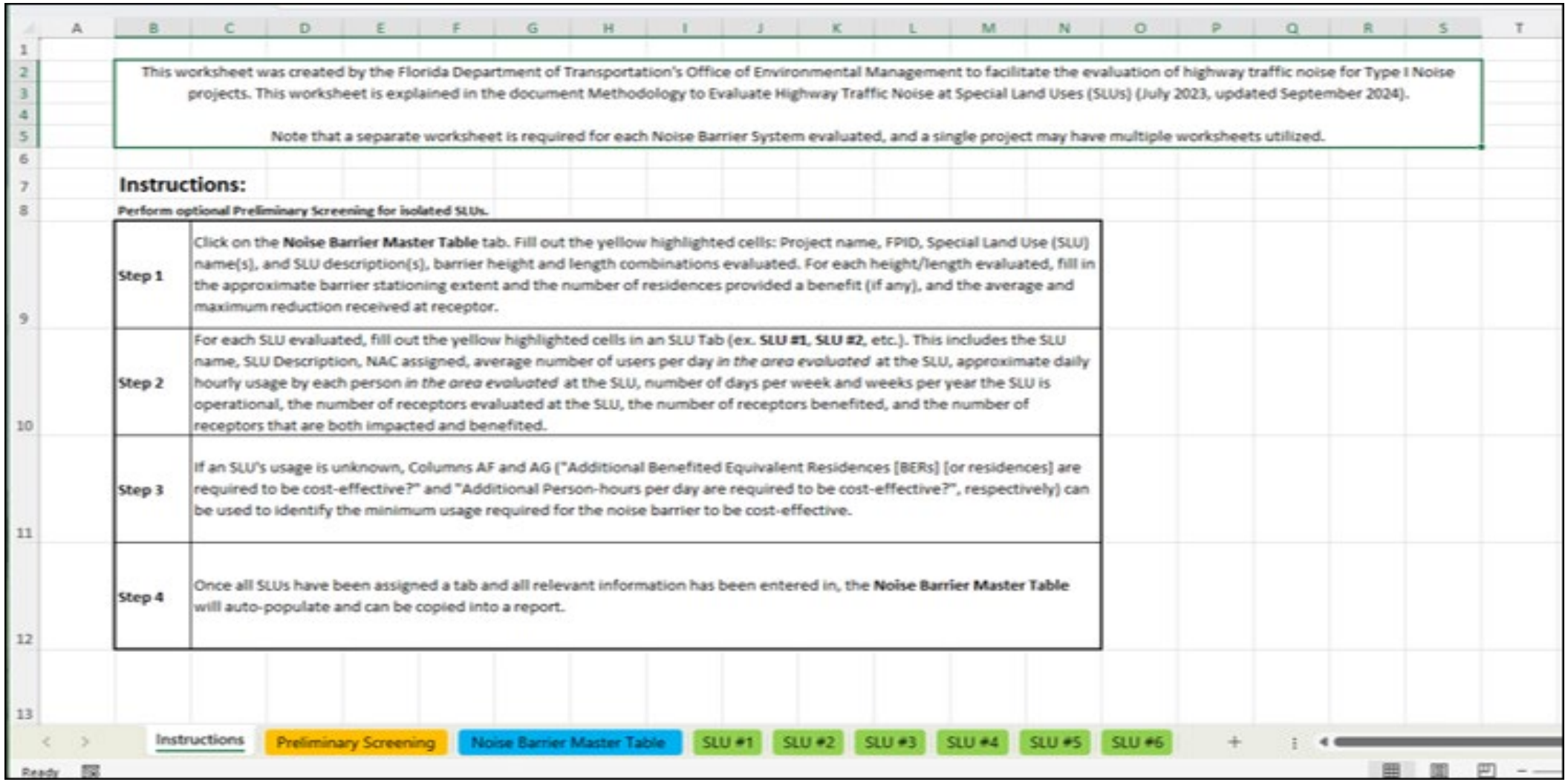
Step 4: Determine Cost Reasonableness

BENEFITED EQUIVALENT RESIDENCE (BER)

Is the residential weighted value assigned to the benefited area of the SLU based upon person-hours of use.

(i.e., number of residences that the benefited area of an SLU is equivalent to)

Step 4: FDOT SLU Worksheet



This worksheet was created by the Florida Department of Transportation's Office of Environmental Management to facilitate the evaluation of highway traffic noise for Type I Noise projects. This worksheet is explained in the document Methodology to Evaluate Highway Traffic Noise at Special Land Uses (SLUs) (July 2023, updated September 2024).

Note that a separate worksheet is required for each Noise Barrier System evaluated, and a single project may have multiple worksheets utilized.

Instructions:

Perform optional Preliminary Screening for isolated SLUs.

Step 1	Click on the **Noise Barrier Master Table** tab. Fill out the yellow highlighted cells: Project name, FPID, Special Land Use (SLU) name(s), and SLU description(s), barrier height and length combinations evaluated. For each height/length evaluated, fill in the approximate barrier stationing extent and the number of residences provided a benefit (if any), and the average and maximum reduction received at receptor.
Step 2	For each SLU evaluated, fill out the yellow highlighted cells in an SLU Tab (ex. **SLU #1**, **SLU #2**, etc.). This includes the SLU name, SLU Description, NAC assigned, average number of users per day *in the area evaluated* at the SLU, approximate daily hourly usage by each person *in the area evaluated* at the SLU, number of days per week and weeks per year the SLU is operational, the number of receptors evaluated at the SLU, the number of receptors benefited, and the number of receptors that are both impacted and benefited.
Step 3	If an SLU's usage is unknown, Columns AF and AG ("Additional Benefited Equivalent Residences [BERs] [or residences] are required to be cost-effective?" and "Additional Person-hours per day are required to be cost-effective?", respectively) can be used to identify the minimum usage required for the noise barrier to be cost-effective.
Step 4	Once all SLUs have been assigned a tab and all relevant information has been entered in, the **Noise Barrier Master Table** will auto-populate and can be copied into a report.

Instructions | Preliminary Screening | Noise Barrier Master Table | SLU #1 | SLU #2 | SLU #3 | SLU #4 | SLU #5 | SLU #6

Ready

Step 4: Noise Barrier Master Table

BER = Benefited Equivalent Residence

ALL YELLOW HIGHLIGHTED CELLS SHOULD BE FILLED IN BY THE NOISE ANALYST.

Note: Barrier Height/Length and # of residences benefited should be completed in "Noise Barrier Master Table" Tab first. Then, details of each SLU should be entered in the yellow cells in the SLU tabs. The noise barrier height/length is auto-populated into the SLU Tabs.

Project	
FPID	
SLU Name(s)	
SLU Description(s)	

Table 1 - Noise Barrier Evaluation

Cost per sq. ft. $40 | Residences | SLUs | Cost-Effectiveness Criteria ($/per benefit): $64,000

Barrier Scenario ID	Barrier Location	Barrier Height	Barrier Length[1]	Barrier Total Cost[2]	Approximate Barrier Stationing Extent[3]	Impacted and Benefited	Benefited	Impacted and Benefited Equivalent Residences	Benefited Equivalent Residences	Total Impacted and Benefited Residences and Equivalent Residences	Total Benefited Residences and Equivalent Residences[4]	Average Reduction [(dB(A)]	Maximum Reduction [(dB(A)][5]	Cost per Benefited Residence/ Equivalent Residence	Cost-Effective & Reasonable?
1	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
2	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
3	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
4	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
5	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
6	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
7	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														
8	ROW			$ -				0	0	0.0	0				NOT REASONABLE
	Shoulder														
	Structure														

[1]Barrier length refers to the total length at the ROW, Shoulder, or on Structure.

[2]Assumes $40 per square foot.

[3] Alternatively, XY coordinates may be provided.

[4] Include both impacted and non-impacted benefits.

[4]If total Impacted BER is less than 2, the noise barrier is not considered feasible.

[5]Maximum Reduction refers to the maximum reduction at any receptor (residential or SLU) evaluated for the noise barrier. If 7 dB(A) or greater, the Noise Reduction Design Goal (NRDG) is met.

"BACK-IN" Calculation

If not Cost-Effective, how many...

Additional BERs (or residences) are required to be cost-effective?[5]	Additional Person-hours per day are required in the benefited area to be cost-effective?[5]
0.0	-
0.0	-
0.0	-
0.0	-
0.0	-
0.0	-
0.0	-
0.0	-

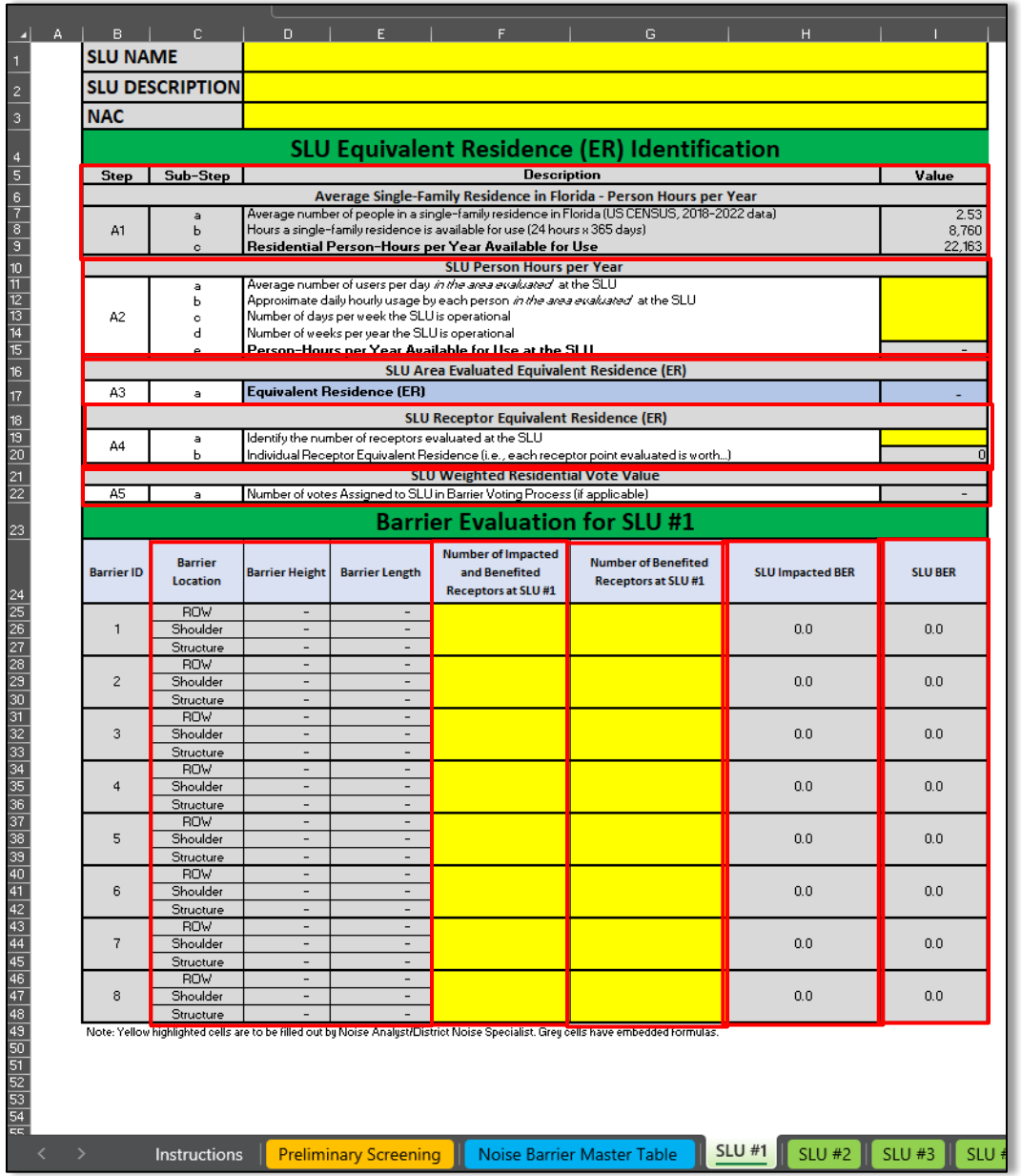
[5]Only to be utilized when an SLU does not know usage data. This column can be used to identify the minimum usage the SLU needs to have in order to make the noise barrier cost-effective.

Instructions | Preliminary Screening | Noise Barrier Master Table | SLU #1 | SLU #2 | SLU #3 | SLU #4 | SLU #5 | SLU #6

*Available on the FDOT Website at: https://www.fdot.gov/environment/documents---resources

NOTE: The cost per square foot has increased to $40/sq.f.t and the cost per benefit has increased to $64,000/benefited receptor with the publication of the 2024 PD&E Manual Chapter. The SLU Methodology and Worksheet are in the process of being updated to reflect the new criteria..

Step 4: SLU Tabs



SLU NAME	
SLU DESCRIPTION	
NAC	

SLU Equivalent Residence (ER) Identification

Step	Sub-Step	Description	Value
		Average Single-Family Residence in Florida - Person Hours per Year	
A1	a	Average number of people in a single-family residence in Florida (US CENSUS, 2018-2022 data)	2.53
	b	Hours a single-family residence is available for use (24 hours x 365 days)	8,760
	c	**Residential Person-Hours per Year Available for Use**	22,163
		SLU Person Hours per Year	
A2	a	Average number of users per day *in the area evaluated* at the SLU	
	b	Approximate daily hourly usage by each person *in the area evaluated* at the SLU	
	c	Number of days per week the SLU is operational	
	d	Number of weeks per year the SLU is operational	
	e	**Person-Hours per Year Available for Use at the SLU**	-
		SLU Area Evaluated Equivalent Residence (ER)	
A3	a	**Equivalent Residence (ER)**	-
		SLU Receptor Equivalent Residence (ER)	
A4	a	Identify the number of receptors evaluated at the SLU	
	b	Individual Receptor Equivalent Residence (i.e., each receptor point evaluated is worth...)	0
		SLU Weighted Residential Vote Value	
A5	a	Number of votes Assigned to SLU in Barrier Voting Process (if applicable)	-

Barrier Evaluation for SLU #1

Barrier ID	Barrier Location	Barrier Height	Barrier Length	Number of Impacted and Benefited Receptors at SLU #1	Number of Benefited Receptors at SLU #1	SLU Impacted BER	SLU BER
1	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
2	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
3	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
4	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
5	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
6	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
7	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				
8	ROW	-	-			0.0	0.0
	Shoulder	-	-				
	Structure	-	-				

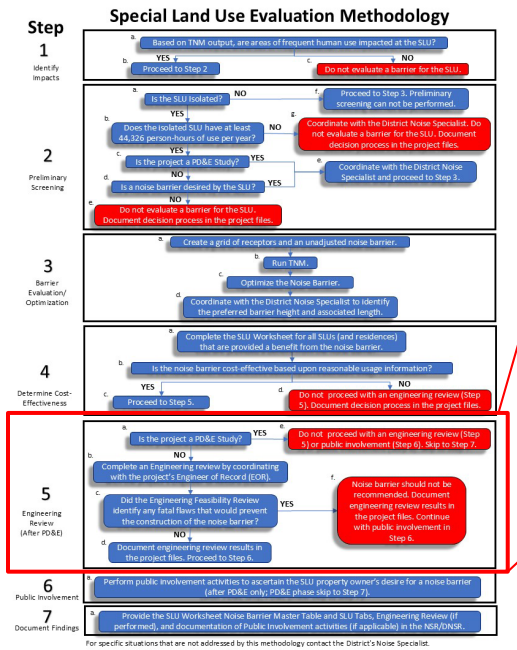
Note: Yellow highlighted cells are to be filled out by Noise Analyst/District Noise Specialist. Grey cells have embedded formulas.

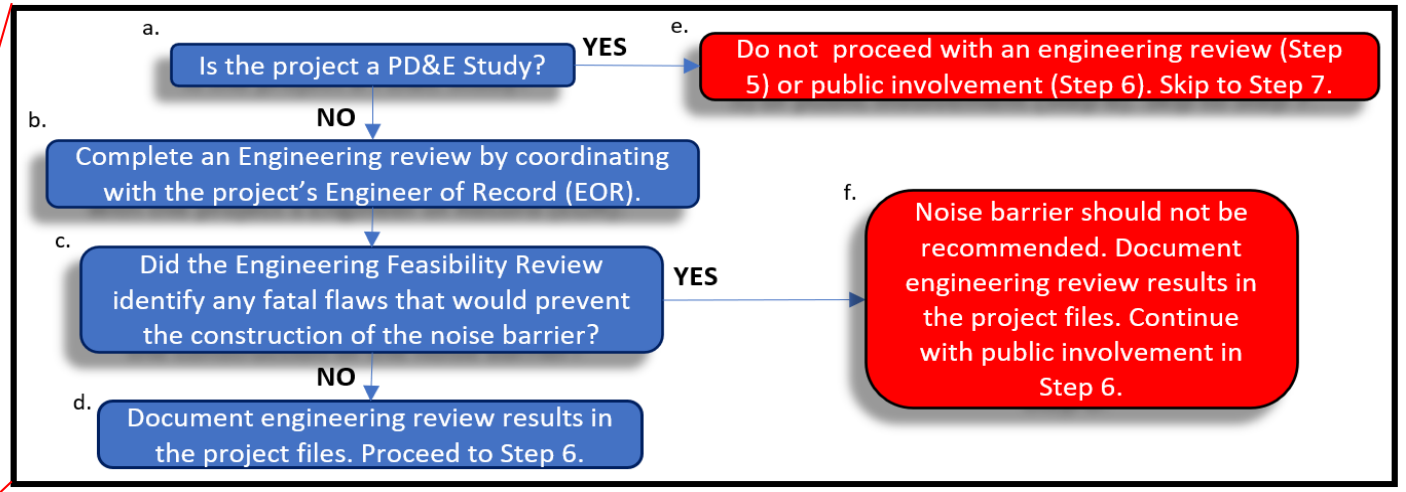
Instructions | Preliminary Screening | Noise Barrier Master Table | SLU #1 | SLU #2 | SLU #3 | SLU #

BER = Benefited Equivalent Residence

*Available on the FDOT Website at: https://www.fdot.gov/environment/documents---resources

Step 5: Engineering Review (After PD&E Phase)





- An engineering review is typically not performed in the PD&E phase of a project
- Once an optimal barrier height and length have been chosen, a thorough engineering feasibility review of the barrier should be initiated by the Noise Analyst
- This process ensures the recommended barrier can be constructed as planned, or if further refinements are necessary, completing those before proceeding with the noise barrier

Tip: For any questions consult Part 2, Chapter 18 of the PD&E Manual (Highway Traffic Noise) and 23 CFR Part 772 and the FDOT Design Manual

Step 5: Engineering Review (After PD&E Phase)

- The Noise Analyst should provide a form with the proposed noise barrier details to the Engineer of Record (EOR)
- The EOR should fill out the form and address the following concerns:
  - Design/constructability
  - Drainage
  - Utility
  - Safety
  - Maintenance
  - ROW Acquisition
  - Legal
  - Outdoor advertising
- Additionally, the EOR should make a final determination if the barrier can be constructed.
- The form should be provided in the appendix of the Noise Report

Noise Barrier Engineering Review Form

123456-1 Widen Florida Avenue from Miami Rd. to Western Rd. (MP 1.0 to 4.0)

Hillsborough County, Florida

Noise Barrier #: _____

Date Provided: _____

Date Reviewed: _____

Reviewed By: _____

Topic	Details
Location	ROW
Length	5,000
Height	22
Estimated Cost (@ $30/ sq. ft.)	$3,300,00
Design/Constructability Issues	
Drainage Issues	
Utility Issues	
Safety Issues	
Maintenance Issues	
ROW Acquisition Issues	
Legal Issues	
Outdoor Advertising Issues	
Are any of the above issues severe enough so that a noise barrier cannot be constructed at this location? If so, please explain in detail.	

Step 6: Public Involvement

Public involvement should occur throughout the lifecycle of a project. Several public involvement tasks related to a noise barrier are performed, including:

- Public Hearings
- Public Information Meetings
- Determining the SLU's support/opposition to a noise barrier*
  *AFTER engineering review has been performed
- Identifying the number of users at an SLU by coordinating with the SLU owner

Public Workshop

- Discuss noise sensitive sites within the project corridor
- Describe analyses procedures
- Describe potential for traffic noise impacts utilizing generalized noise contours

Public Hearing

- Discuss site specific results of the noise study
- Discuss location of impacted receptors
- Describe potential for noise abatement consideration during design phase
- Provide draft of Noise Study Report

Step 7: Documentation

All Noise Study Reports must have:

- Types, Lengths & Heights, & Evaluation Results
- A table documenting the noise barrier types, heights, lengths, locations, cost, and required minimum person-hours for the noise barrier to be considered cost reasonable must be completed
- All impacted SLUs for which a barrier analysis was performed must have the **FDOT SLU Worksheet, SLU Tab** completed and provided in the Noise Study Report
- All impacted SLUs for which a barrier was **not** performed due to the preliminary screening must document the assumptions used

Note: Provide the **FDOT SLU Worksheet** SLU Tab in the Appendix of the Noise Study Report for any SLU that is evaluated

Step 7: Documentation

Table 1 Example SLU Noise Barrier Evaluation Table

Barrier Scenario	Barrier Location	Barrier Height	Barrier Length[1]	Barrier Total Cost[2]	Approximate Barrier XY Extent (Stationing)	Residences		Special Land Uses		Total Impacted and Benefited Residences and Equivalent Residences[3]	Total Benefited Residences and Equivalent Residences	Average Reduction [(dB(A)]	Maximum Reduction [(dB(A)][4]	Cost per Benefited Equivalent Residence	Cost-Effective?
						Impacted and Benefited	Benefited	Impacted and Benefited Equivalent Residences	Benefited Equivalent Residences						
1	Shoulder														
	Structure	8													
2	Shoulder														
	Structure	8													
3	Shoulder														
	Structure	8													
4	Shoulder														
	Structure	8													
5	Shoulder														
	Structure	8													
6	Shoulder														
	Structure	8													
7	Shoulder														
	Structure	8													
8	Shoulder														
	Structure	8													

[1]Barrier length refers to the total length at the ROW, Shoulder, or on Structure.
[2]Assumes $40 per square foot.
[3]If total Impacted BER is less than 2, the noise barrier is not considered feasible.
[4]Maximum Reduction refers to the maximum reduction at any receptor (residential or SLU) evaluated for the noise barrier. If 7 dB(A) or greater, the Noise Reduction Design Goal (NRDG) is met.
[5]Only to be utilized when an SLU does not know usage data. This column can be used to identify the minimum usage the SLU needs to have in order to make the noise barrier cost-effective.

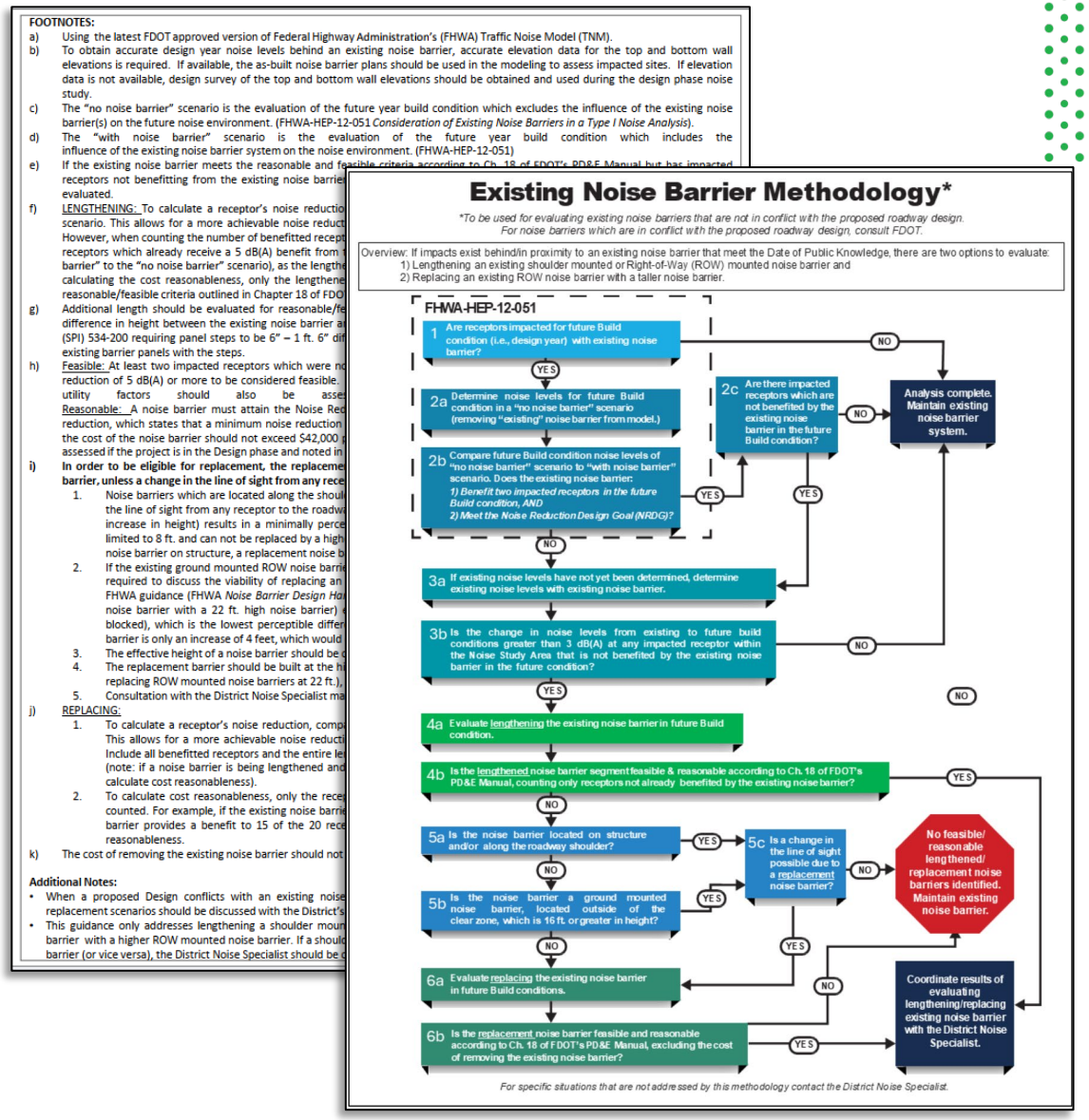
BER = Benefited Equivalent Residence

NOTE: The cost per square foot has increased to $40/sq.f.t and the cost per benefit has increased to $64,000/benefited receptor with the publication of the 2024 PD&E Manual Chapter. The SLU Methodology and Worksheet are in the process of being updated to reflect the new criteria..

LESSON 6
Existing Noise Barrier Methodology

Existing Noise Barrier Methodology

- FDOT has developed a methodology on how to evaluate highway traffic noise when an existing noise barrier is present
- Follows FHWA-HEP-12-051 https://www.fhwa.dot.gov/environment/noise/noise_barriers/abatement/existing.cfm
- Evaluate further if impacts that do not receive a benefit still exist
- Evaluate:
  - Lengthening
  - Increasing Height
    - Demolish existing barrier and reconstruct higher barrier



FOOTNOTES:

a) Using the latest FDOT approved version of Federal Highway Administration's (FHWA) Traffic Noise Model (TNM).

b) To obtain accurate design year noise levels behind an existing noise barrier, accurate elevation data for the top and bottom wall elevations is required. If available, the as-built noise barrier plans should be used in the modeling to assess impacted sites. If elevation data is not available, design survey of the top and bottom wall elevations should be obtained and used during the design phase noise study.

c) The "no noise barrier" scenario is the evaluation of the future year build condition which excludes the influence of the existing noise barrier(s) on the future noise environment. (FHWA-HEP-12-051 *Consideration of Existing Noise Barriers in a Type I Noise Analysis*).

d) The "with noise barrier" scenario is the evaluation of the future year build condition which includes the influence of the existing noise barrier system on the noise environment. (FHWA-HEP-12-051)

e) If the existing noise barrier meets the reasonable and feasible criteria according to Ch. 18 of FDOT's PD&E Manual but has impacted receptors not benefitting from the existing noise barrie evaluated.

f) LENGTHENING: To calculate a receptor's noise reductio scenario. This allows for a more achievable noise reduct However, when counting the number of benefitted recept receptors which already receive a 5 dB(A) benefit from barrier" to the "no noise barrier" scenario), as the length calculating the cost reasonableness, only the lengthene reasonable/feasible criteria outlined in Chapter 18 of FDO

g) Additional length should be evaluated for reasonable/fe difference in height between the existing noise barrier a (SPI) 534-200 requiring panel steps to be 6" – 1 ft. 6" dif existing barrier panels with the steps.

h) Feasible: At least two impacted receptors which were n reduction of 5 dB(A) or more to be considered feasible. utility factors should also be asse Reasonable: A noise barrier must attain the Noise Red reduction, which states that a minimum noise reduction the cost of the noise barrier should not exceed $42,000 assessed if the project is in the Design phase and noted in

i) **In order to be eligible for replacement, the replaceme barrier, unless a change in the line of sight from any rece**

1. Noise barriers which are located along the shoul the line of sight from any receptor to the roadw increase in height) results in a minimally perce limited to 8 ft. and can not be replaced by a high noise barrier on structure, a replacement noise b
2. If the existing ground mounted ROW noise barri required to discuss the viability of replacing an FHWA guidance (FHWA *Noise Barrier Design Ha* noise barrier with a 22 ft. high noise barrier) blocked), which is the lowest perceptible differ barrier is only an increase of 4 feet, which would
3. The effective height of a noise barrier should be
4. The replacement barrier should be built at the h replacing ROW mounted noise barriers at 22 ft.),
5. Consultation with the District Noise Specialist ma

j) REPLACING:

1. To calculate a receptor's noise reduction, comp This allows for a more achievable noise reduct Include all benefitted receptors and the entire le (note: if a noise barrier is being lengthened and calculate cost reasonableness).
2. To calculate cost reasonableness, only the rece counted. For example, if the existing noise barri barrier provides a benefit to 15 of the 20 rece reasonableness.

k) The cost of removing the existing noise barrier should not

Additional Notes:

- When a proposed Design conflicts with an existing noise replacement scenarios should be discussed with the District's
- This guidance only addresses lengthening a shoulder mour barrier with a higher ROW mounted noise barrier. If a should barrier (or vice versa), the District Noise Specialist should be

Existing Noise Barrier Methodology*

**To be used for evaluating existing noise barriers that are not in conflict with the proposed roadway design. For noise barriers which are in conflict with the proposed roadway design, consult FDOT.*

Overview: If impacts exist behind/in proximity to an existing noise barrier that meet the Date of Public Knowledge, there are two options to evaluate:
1) Lengthening an existing shoulder mounted or Right-of-Way (ROW) mounted noise barrier and
2) Replacing an existing ROW noise barrier with a taller noise barrier.

FHWA-HEP-12-051

1 Are receptors impacted for future Build condition (i.e., design year) with existing noise barrier?

2a Determine noise levels for future Build condition in a "no noise barrier" scenario (removing "existing" noise barrier from model.)

2b Compare future Build condition noise levels of "no noise barrier" scenario to "with noise barrier" scenario. Does the existing noise barrier:
1) Benefit two impacted receptors in the future Build condition, AND
2) Meet the Noise Reduction Design Goal (NRDG)?

2c Are there impacted receptors which are not benefited by the existing noise barrier in the future Build condition?

Analysis complete. Maintain existing noise barrier system.

3a If existing noise levels have not yet been determined, determine existing noise levels with existing noise barrier.

3b Is the change in noise levels from existing to future build conditions greater than 3 dB(A) at any impacted receptor within the Noise Study Area that is not benefited by the existing noise barrier in the future condition?

4a Evaluate lengthening the existing noise barrier in future Build condition.

4b Is the lengthened noise barrier segment feasible & reasonable according to Ch. 18 of FDOT's PD&E Manual, counting only receptors not already benefited by the existing noise barrier?

5a Is the noise barrier located on structure and/or along the roadway shoulder?

5b Is the noise barrier a ground mounted noise barrier, located outside of the clear zone, which is 16 ft. or greater in height?

5c Is a change in the line of sight possible due to a replacement noise barrier?

No feasible/ reasonable lengthened/ replacement noise barriers identified. Maintain existing noise barrier.

6a Evaluate replacing the existing noise barrier in future Build conditions.

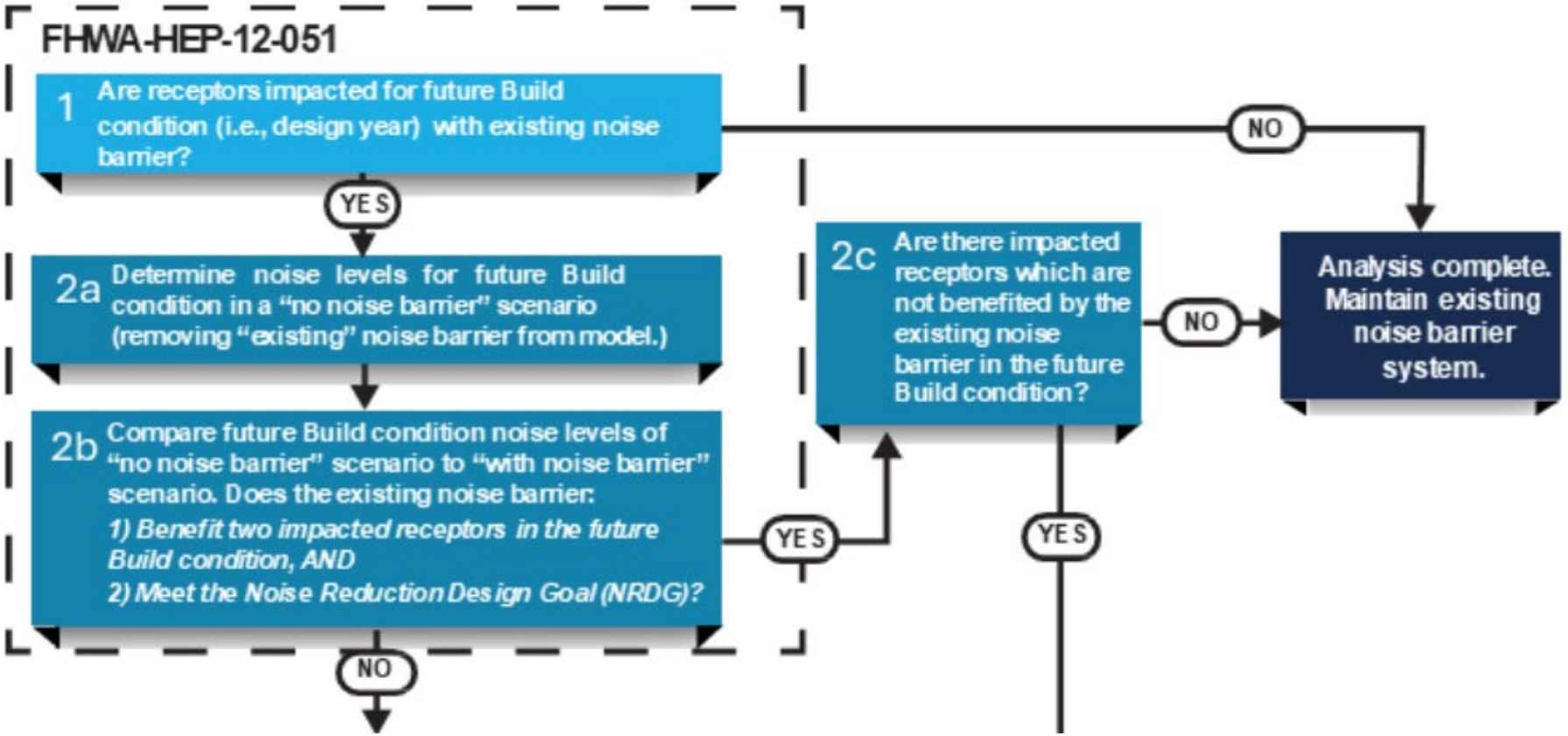
6b Is the replacement noise barrier feasible and reasonable according to Ch. 18 of FDOT's PD&E Manual, excluding the cost of removing the existing noise barrier?

Coordinate results of evaluating lengthening/replacing existing noise barrier with the District Noise Specialist.

For specific situations that are not addressed by this methodology contact the District Noise Specialist.

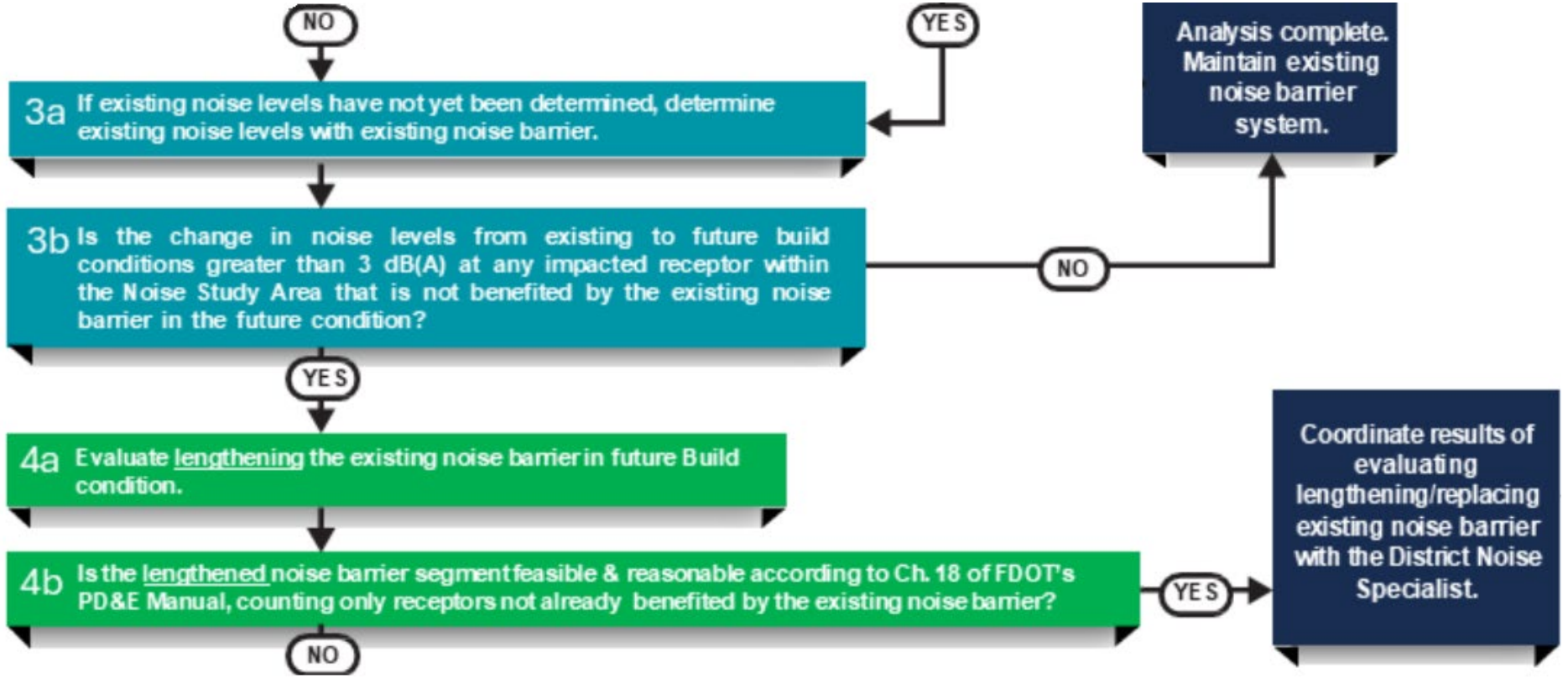
Existing Noise Barrier Methodology

- Begin with FHWA-HEP-12-051
- Steps 1-2c identify if the existing noise barrier is sufficient



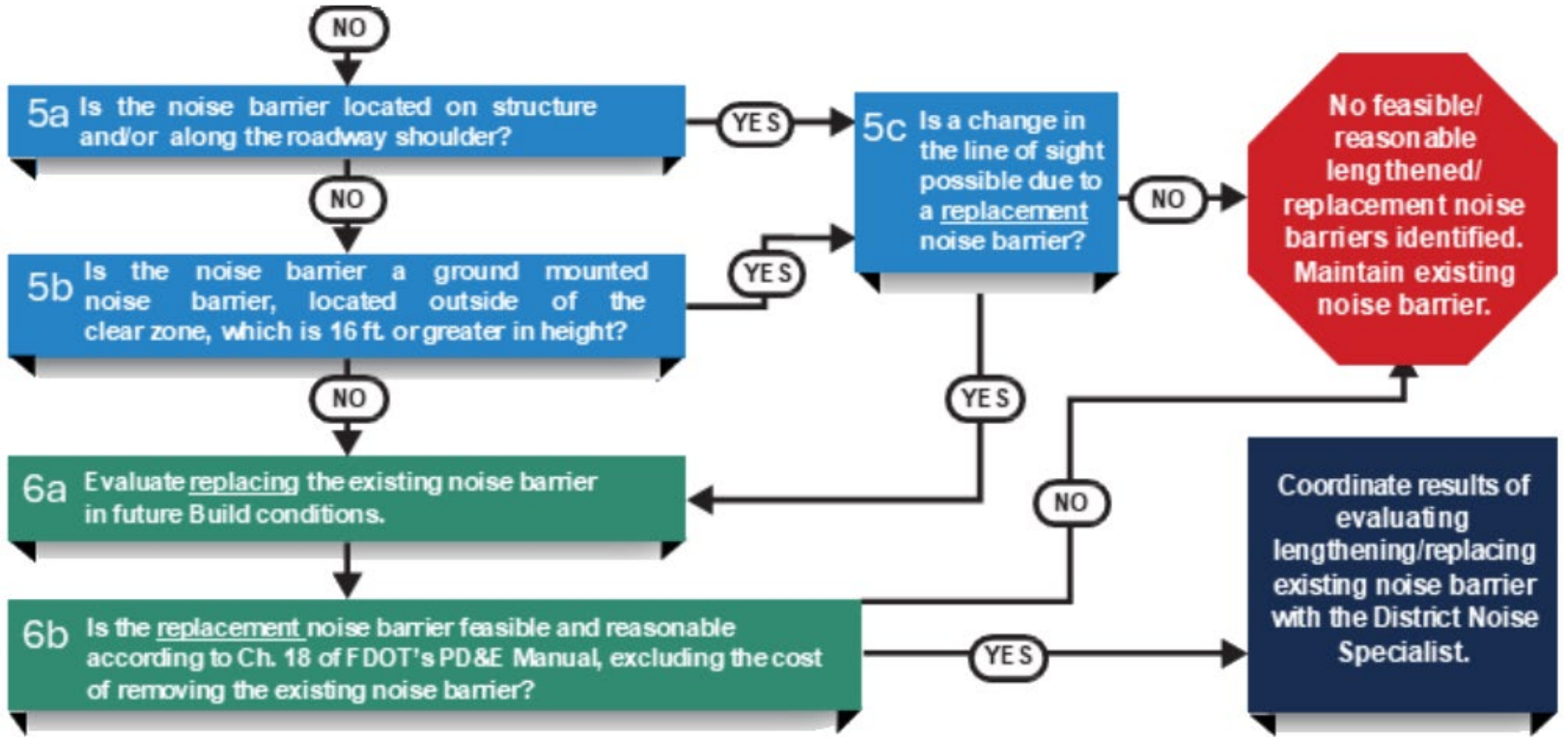
Existing Noise Barrier Methodology

- Evaluate the increase in noise levels
- If above 3 dB(A), evaluate lengthening the noise barriers



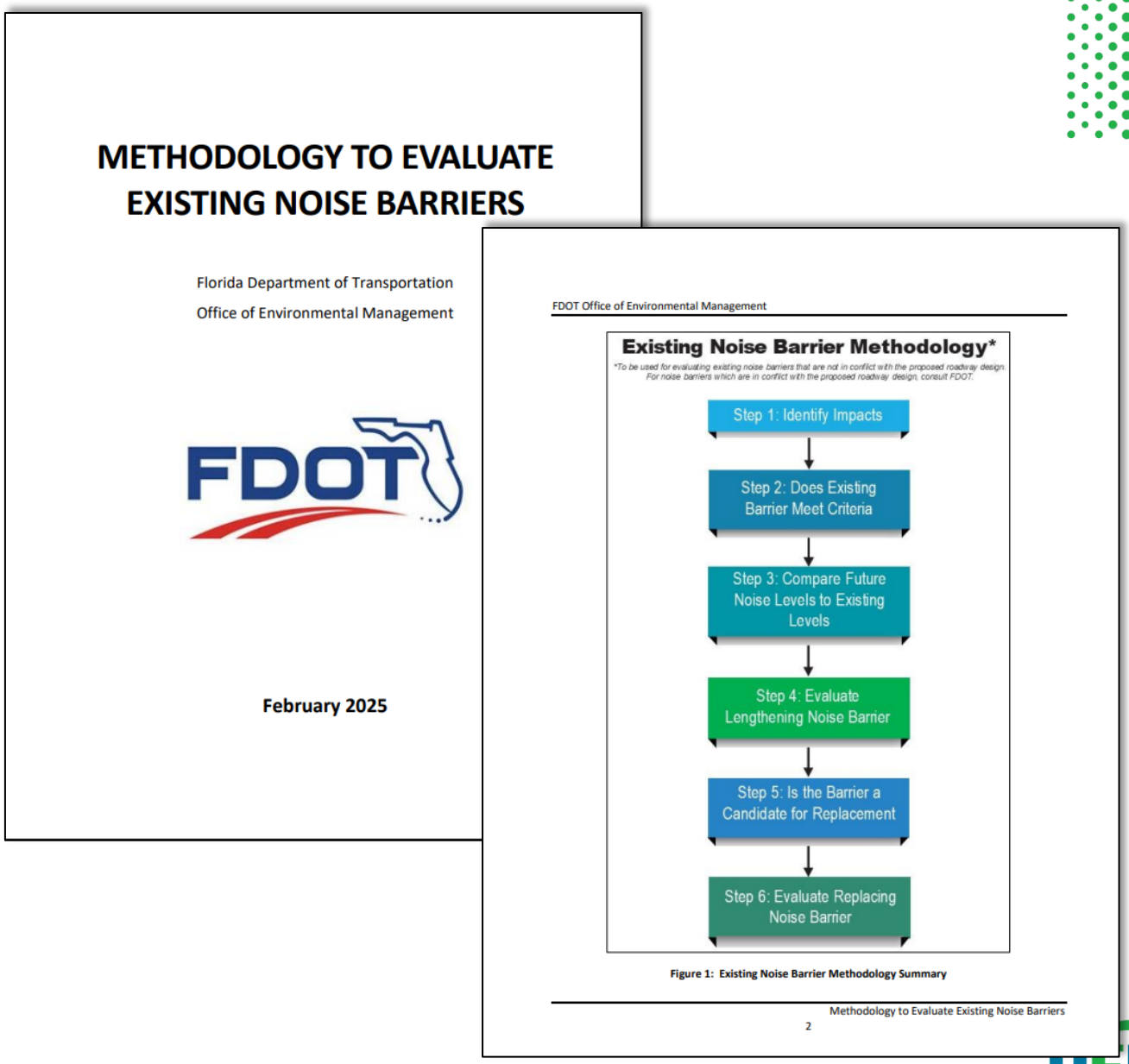
Existing Noise Barrier Methodology

- If lengthening a noise barrier is not appropriate, evaluate replacing the existing noise barrier with a higher noise barrier
- A noise barrier is **not** eligible for replacement if:
  - Located on structure and/or along the roadway shoulder AND a change in the line of sight is not present
  - The existing barrier is 16 ft. or greater in height
- For specific situations that are not addressed by this methodology, contact the District Noise Specialist.



Existing Noise Barrier Methodology

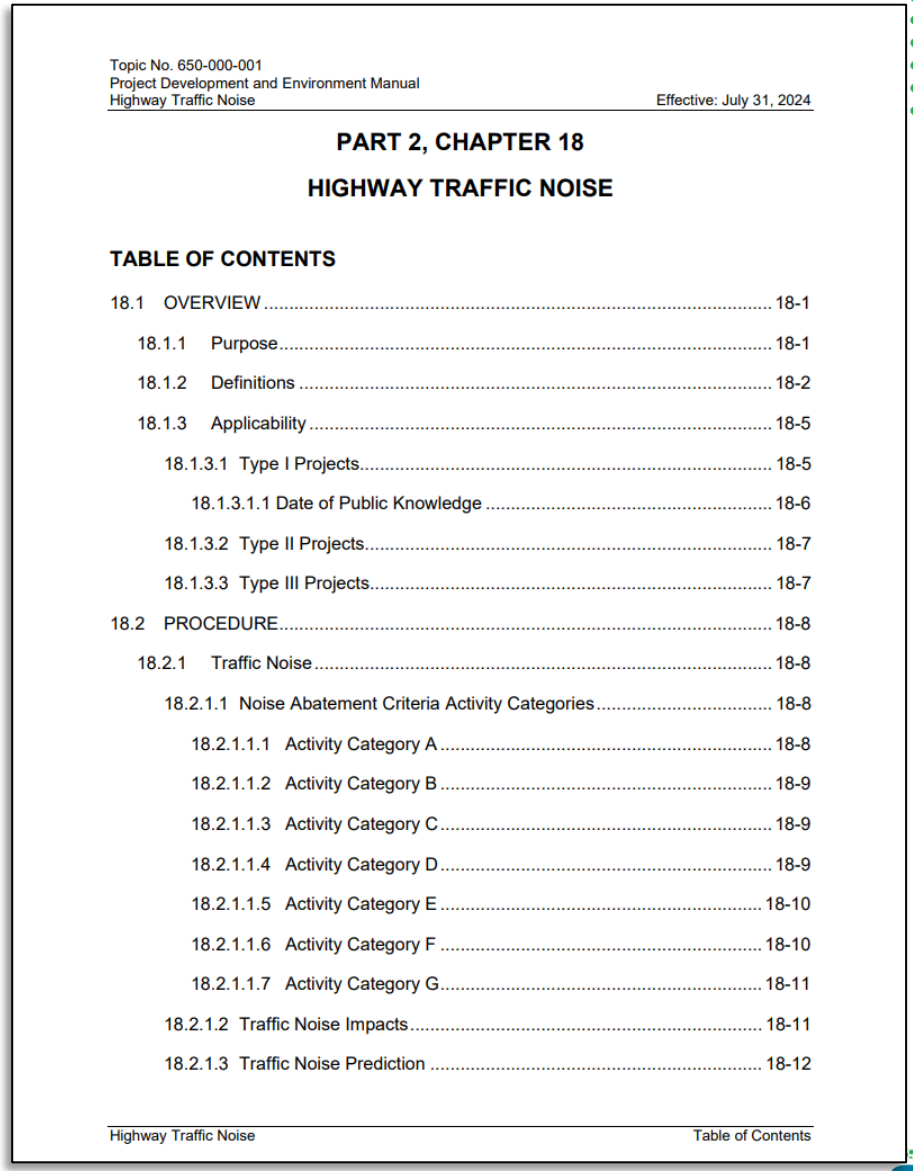
- Guidance document:
  - A Methodology to Evaluate Existing Noise Barriers (February 2025)
  - Can be found on the FDOT OEM Highway Traffic Noise website



LESSON 7
2024 PD&E Manual (Chapter 18) Updates

2024 PD&E Manual Updates

- Noise Barrier Cost Updates
- Date of Public Knowledge application clarification
- Special Land Use Methodology Requirement
- Land Use clarifications for Assisted Living Facilities and Medical Facilities
- Substantial Increases during Design phase
- Traffic Data Spreadsheet use requirement
- Noise Reduction Design Goal Application Clarification
- Validation Guidance for New Alignments
- Existing Noise Barrier Methodology
- Noise Barrier Height recommendations
- Re-Evaluation Clarification
- Naming of Design Phase Noise Study Reports
- Cover Page Template – MOU update
- Update of References
- …and other minor changes.



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Highway Traffic Noise — Effective: July 31, 2024

PART 2, CHAPTER 18

HIGHWAY TRAFFIC NOISE

TABLE OF CONTENTS

Highway Traffic Noise — Table of Contents

Noise Barrier Cost Updates

- $40/sq. ft
  (previously $30 sq. ft.)
- $64,000/benefit limit
  (previously $42k/benefit)
- 1,600 sq. ft./benefit
  (previously 1,400 sq. ft.)
- Average Height of a Noise Barrier: 16 ft.
  (previously 14 ft.)
- 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.
- Publication date of the PD&E Manual is cutoff date for applying the new cost criteria.

18.2.3.3.2 Cost Effectiveness

FDOT has established cost effectiveness criteria that have been in place for many years. 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 unit cost of $40.00 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 (5) years, with the last analysis and approval occurring in 2024. The relationship between unit costs and the upper limit for cost reasonableness 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:

Date of Public Knowledge

- A section specific to Date of Public Knowledge was created under the Type I projects header.
- Additional noise impacts may be considered and mitigated in the areas of design changes, including those not meeting the original DPK.
- The original DPK for projects where the Environmental Document has been approved will remain valid.

18.1.3.1.1 Date of Public Knowledge

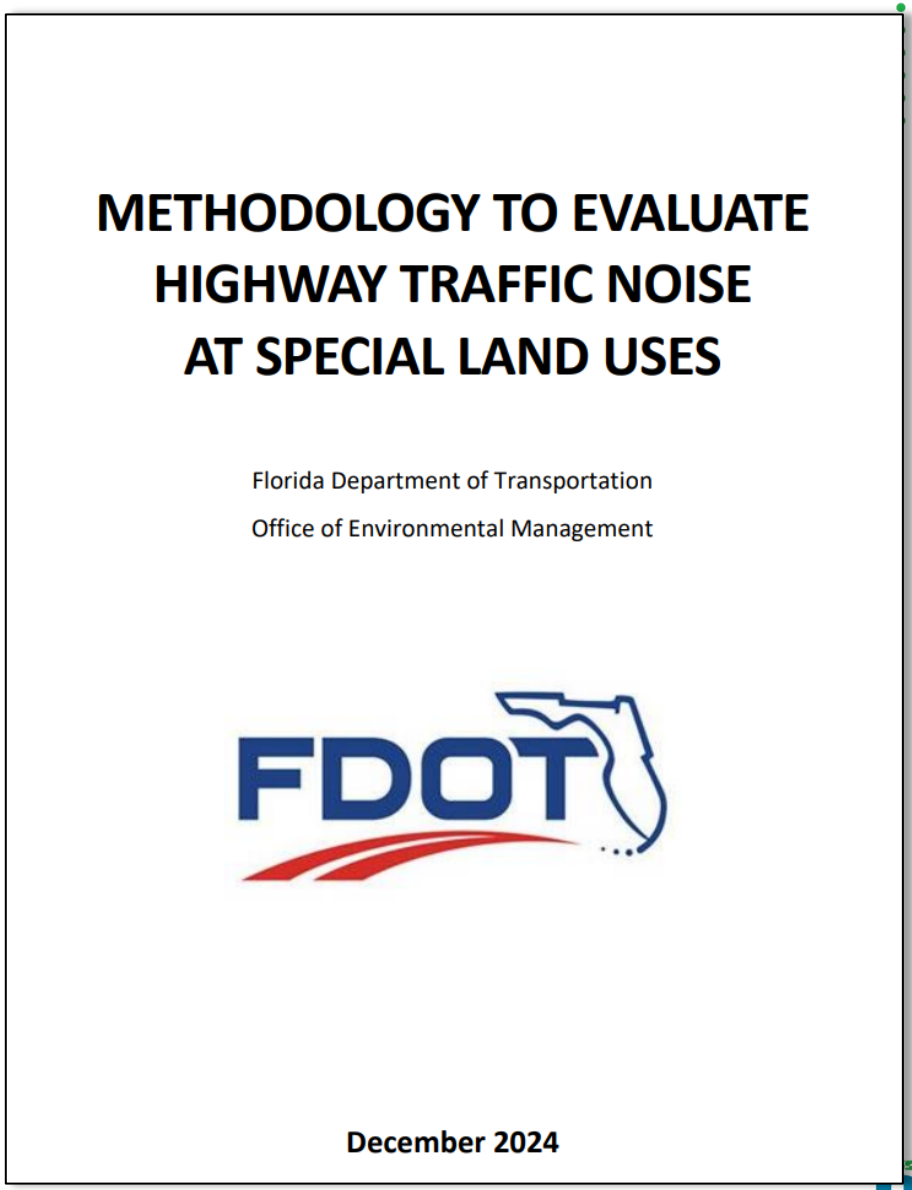
The Date of Public Knowledge (DPK) is the date of approval of the CE, the FONSI, or the ROD, as defined in ***23 CFR Part 771***. The original DPK for projects where the Environmental Document has been approved will remain valid unless OEM determines that a ***NEPA*** document or decision needs to be 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 ***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.

State funded highway projects shall be "grandfathered" and will not have to meet the ***23 CFR Part 772*** final rule if the SEIR document or ***Non-Major State Action Checklist*** has been signed by July 13, 2011.

Special Land Use Methodology Requirement

- The FDOT publication *A Methodology to Evaluate 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
- Publication date of the PD&E Manual is cutoff date for applying the new SLU Methodology
- Most recent version is December 2024

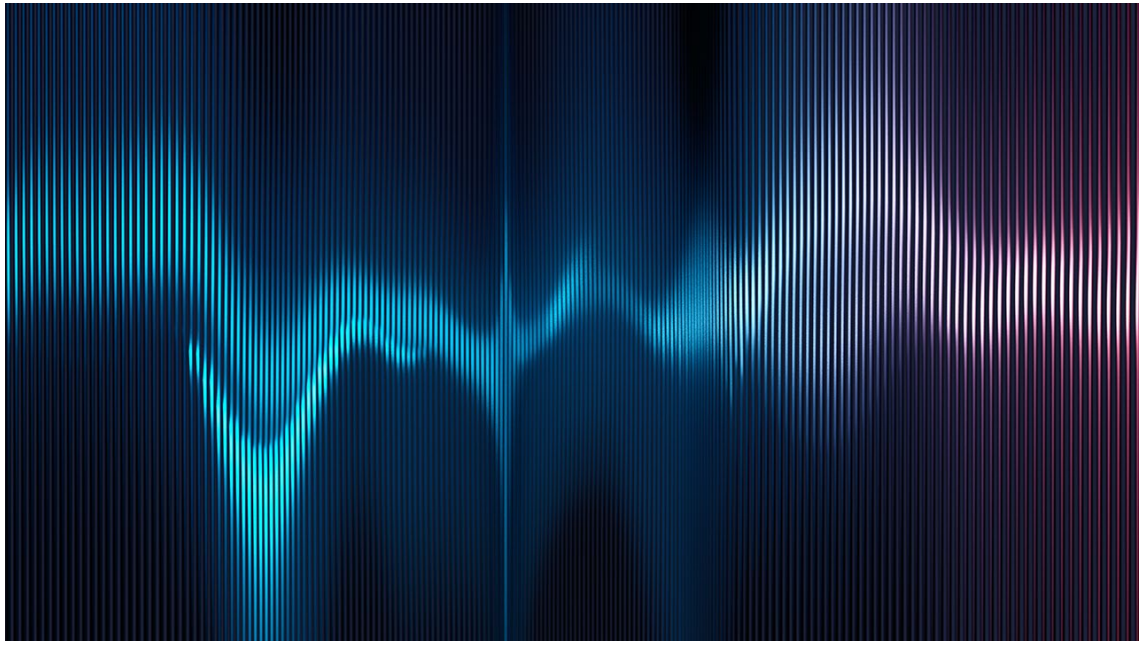


Land Use Clarifications

- Assisted Living Facilities
- Medical Facilities
  - FHWA defines a medical facility as an inpatient medical facility where medical treatment and care occurs. (i.e., an overnight stay at the facility is required; e.g., a hospital, rehabilitation facilities)

Substantial Increases

- When substantial increases are identified in PD&E, a re-evaluation of substantial increases is required during a project's Design phase



Traffic Data Spreadsheet Requirement

- The FDOT Traffic Data Spreadsheet is ***required*** to be submitted alongside TNM files submitted to FDOT

18.2.1.5 Traffic Requirements

In predicting traffic noise levels and assessing impacts, traffic characteristics that would yield the highest traffic noise impact for the design year shall be used. Experience has shown that the greatest traffic volume at which a roadway's design vehicular speed can be maintained usually creates the noisiest conditions. Maximum peak-hourly traffic representing Level of Service (LOS) "C" will be used, unless traffic analysis shows that LOS C will not be reached. If LOS "C" will not be reached, demand volumes shall be used. If demand volumes are used in place of LOS "C" volumes, the directional peak traffic should be worst-case for receptors on each side of the roadway.

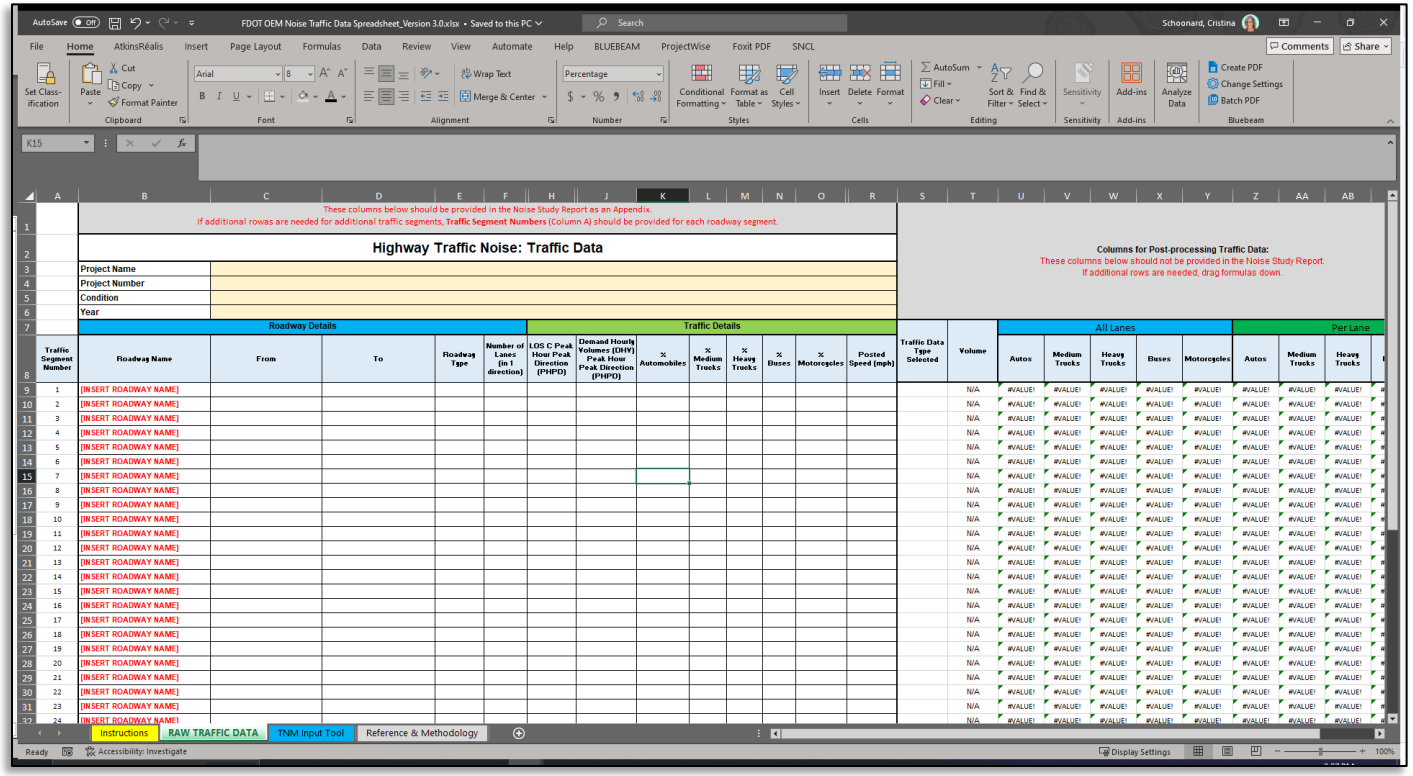
For ramps, use the following:

1. For interchange ramp traffic, demand traffic volumes shall be used, even if they are higher than the LOS "C" volumes.

2. The vehicle speed to be used in the TNM is the posted speed for existing/no-build alternatives, and the proposed posted speed for the future build alternative. If the proposed posted speed is unknown, then the design speed is to be used. The motor vehicle speed used for ramps will be the posted speed and that speed is applied along the entire ramp unless modified by the flow condition (using TNM flow control if applicable).

Section 1.2 of the ***Traffic Noise Modeling and Analysis Practitioners Handbook*** contains additional guidance on the application of traffic data for noise studies.

FDOT's ***Traffic Data for Traffic Noise Spreadsheet*** should be utilized when converting traffic data to be entered into TNM. The ***Traffic Data for Traffic Noise Spreadsheet*** is required to be provided alongside the TNM files when submitted to FDOT.

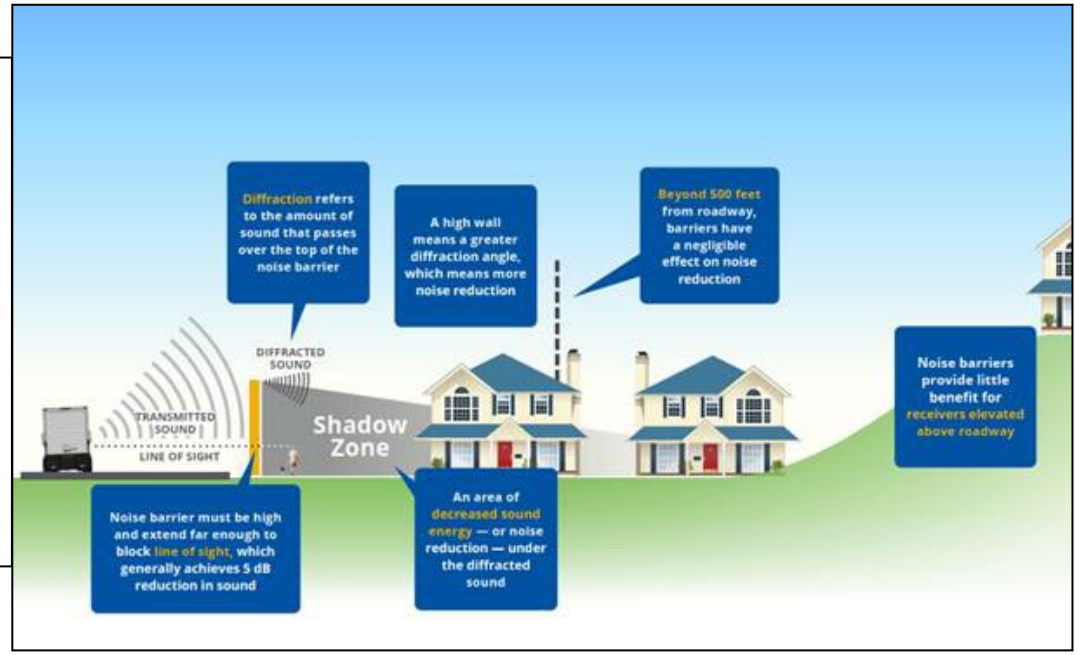


Noise Reduction Design Goal Application Clarification

- The noise reduction design goal should be applied to residential as well as non-residential (i.e., special land uses) noise barrier evaluations.

18.2.3.3.3 Noise Reduction Design Goal

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 (1) or more benefited receptors as the NRDG. Failure to achieve the NRDG will result in the noise abatement measure being deemed not reasonable. In setting this goal, FDOT reviewed historic records of noise barrier reduction dating back to 1979. The average noise reduction for these noise barriers was 7.36 dB(A), which would indicate that the NRDG of 7 dB(A) is reasonable. The NRDG should be applied to residential as well as non-residential (i.e., special land uses) noise barrier evaluations.

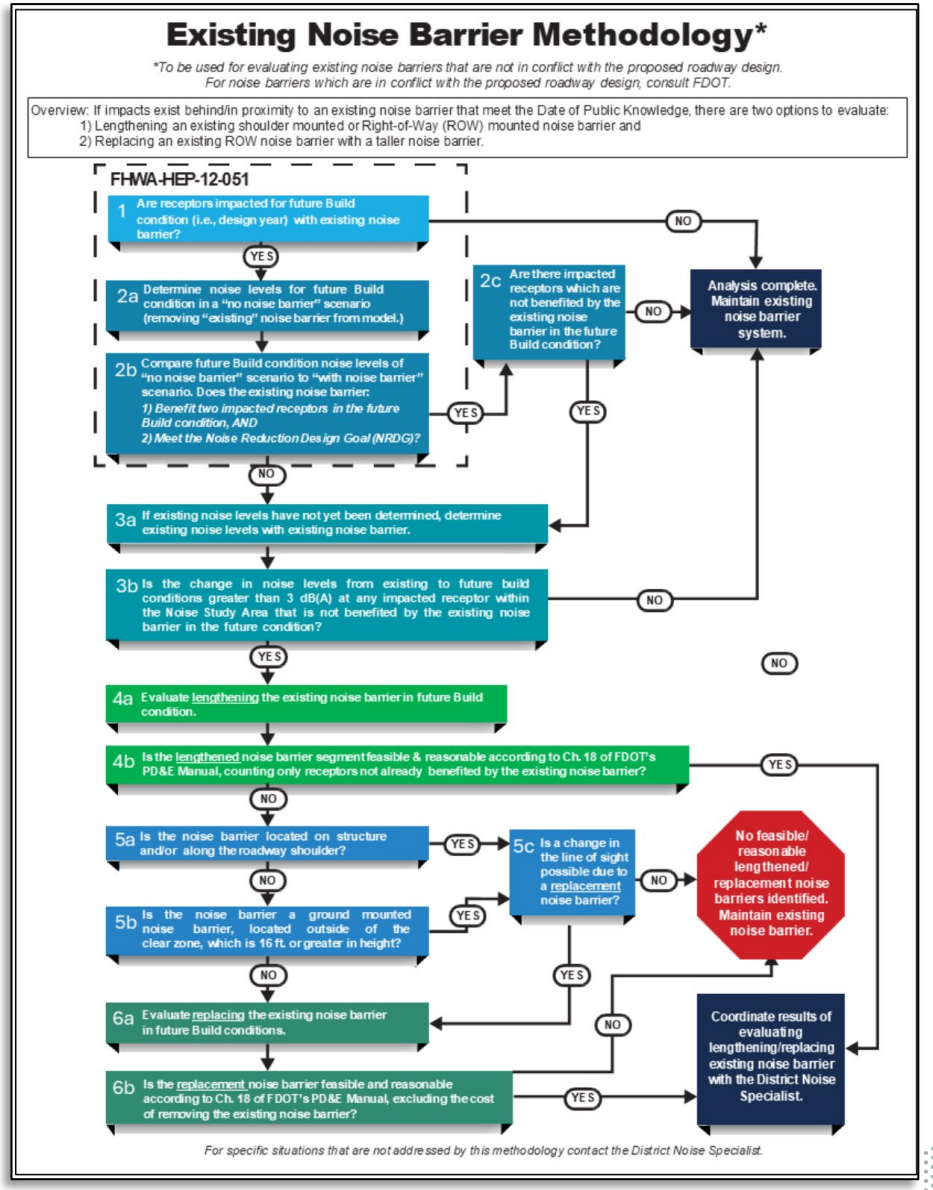


Validation Guidance for New Alignments

- Validation measurements are required to be taken along new and existing alignments, per ***23 CFR § 772.11(d)(2)***
- **New alignments -** validation measurements should be performed at the existing roadway to which the proposed new alignment will connect

Existing Noise Barrier Methodology

- Projects which have existing noise barriers present should follow guidance in the FDOT's ***Existing Noise Barrier Methodology Flowchart.***
- Detailed Guidance Document has been developed since the 2024 PD&E Manual publication and will be referenced in the 2025 update of the PD&E Manual.



Noise Barrier Height Recommendation

- Where appropriate, the noise barrier with the maximum height configuration which is considered reasonable and feasible should be selected for recommendation

Re-Evaluation Clarification

- **Changes in TNM versions**
  - If the latest noise evaluation utilized a previous version of TNM (prior to TNM version 2.5), an update of the traffic noise analysis is required.

18.2.8 Re-evaluations

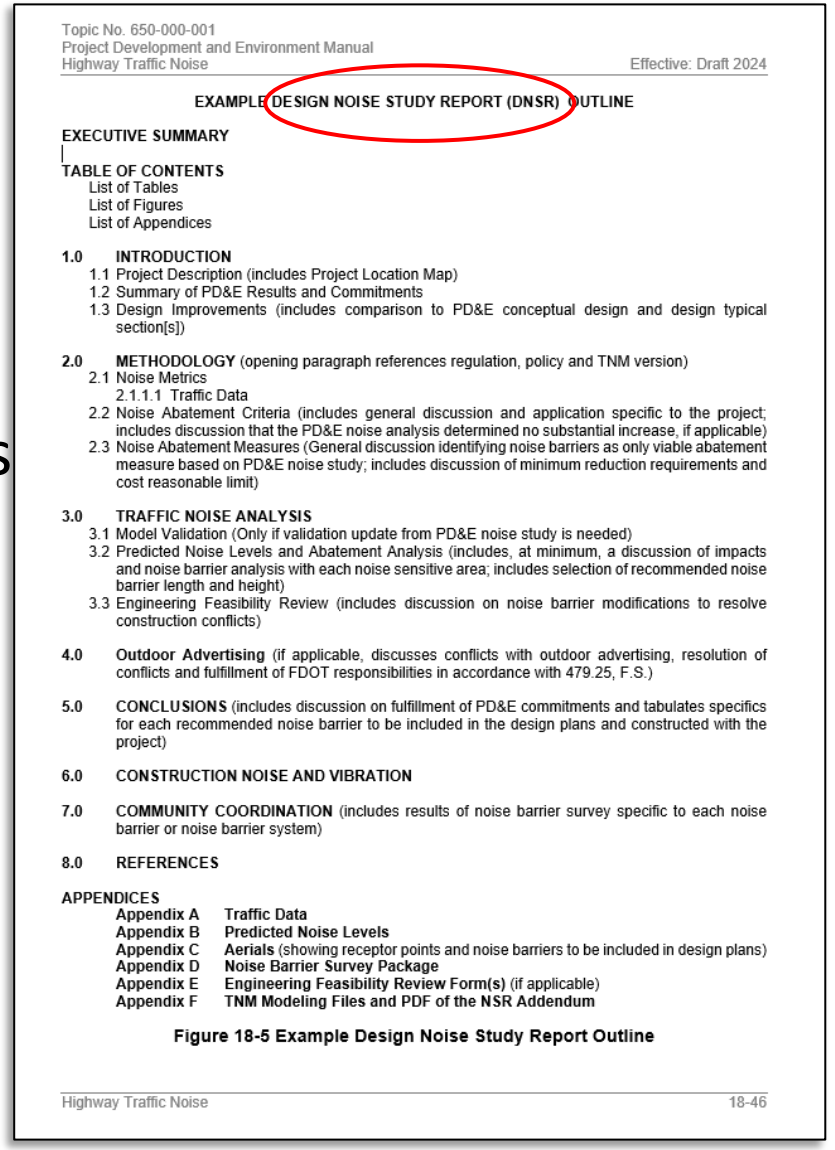
The Re-evaluation of any Environmental Document that included an ***NSR*** shall also include an update of the traffic noise analysis. Assumptions made and data used during the original noise analysis and documented in the ***NSR*** shall be reviewed and updated to ensure the assumptions and any preliminary 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, and changes in TNM versions. If the latest noise evaluation utilized a previous version of TNM (prior to TNM version 2.5), an update of the traffic noise analysis is required. Changes to the horizontal and vertical roadway alignment should follow the guidance provided in the Type I Projects Matrix provided in ***Figure 18-2***. The Re-evaluation may result in no change to the ***NSR*** or in a completely new ***DNSR*** 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 will be conducted using the latest approved version for any required subsequent noise Re-evaluation as a result of a major design change.

Coordination with OEM during the Re-evaluation process on 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 ***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.

Naming of Design Phase Noise Study Report

- Design phase Noise Study Reports are no longer using the term “Addendum”
- A Design Phase Noise Study Report will be known as a “Design Noise Study Report (DNSR)”



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Highway Traffic Noise — Effective: Draft 2024

EXAMPLE DESIGN NOISE STUDY REPORT (DNSR) OUTLINE

EXECUTIVE SUMMARY

TABLE OF CONTENTS
List of Tables
List of Figures
List of Appendices

1.0 INTRODUCTION
1.1 Project Description (includes Project Location Map)
1.2 Summary of PD&E Results and Commitments
1.3 Design Improvements (includes comparison to PD&E conceptual design and design typical section[s])

2.0 METHODOLOGY (opening paragraph references regulation, policy and TNM version)
2.1 Noise Metrics
2.1.1.1 Traffic Data
2.2 Noise Abatement Criteria (includes general discussion and application specific to the project; includes discussion that the PD&E noise analysis determined no substantial increase, if applicable)
2.3 Noise Abatement Measures (General discussion identifying noise barriers as only viable abatement measure based on PD&E noise study; includes discussion of minimum reduction requirements and cost reasonable limit)

3.0 TRAFFIC NOISE ANALYSIS
3.1 Model Validation (Only if validation update from PD&E noise study is needed)
3.2 Predicted Noise Levels and Abatement Analysis (includes, at minimum, a discussion of impacts and noise barrier analysis with each noise sensitive area; includes selection of recommended noise barrier length and height)
3.3 Engineering Feasibility Review (includes discussion on noise barrier modifications to resolve construction conflicts)

4.0 Outdoor Advertising (if applicable, discusses conflicts with outdoor advertising, resolution of conflicts and fulfillment of FDOT responsibilities in accordance with 479.25, F.S.)

5.0 CONCLUSIONS (includes discussion on fulfillment of PD&E commitments and tabulates specifics for each recommended noise barrier to be included in the design plans and constructed with the project)

6.0 CONSTRUCTION NOISE AND VIBRATION

7.0 COMMUNITY COORDINATION (includes results of noise barrier survey specific to each noise barrier or noise barrier system)

8.0 REFERENCES

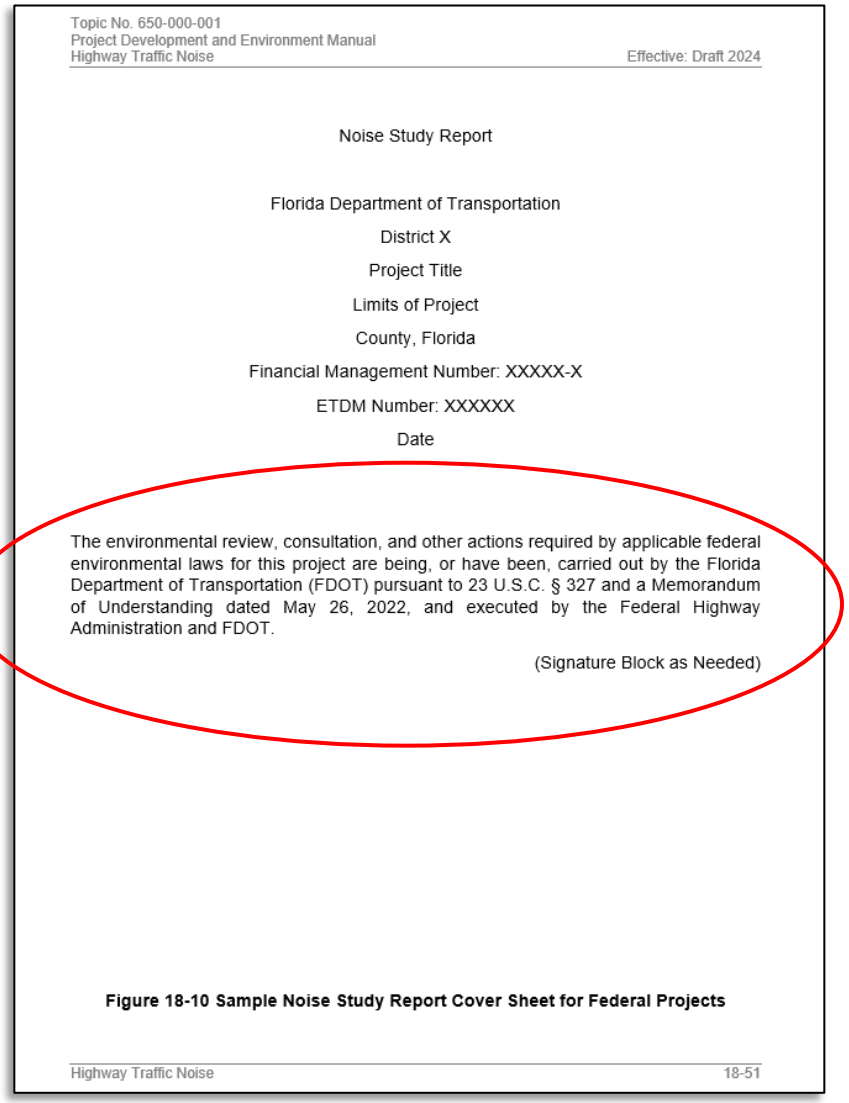
APPENDICES
Appendix A Traffic Data
Appendix B Predicted Noise Levels
Appendix C Aerials (showing receptor points and noise barriers to be included in design plans)
Appendix D Noise Barrier Survey Package
Appendix E Engineering Feasibility Review Form(s) (if applicable)
Appendix F TNM Modeling Files and PDF of the NSR Addendum

Figure 18-5 Example Design Noise Study Report Outline

Highway Traffic Noise 18-46

Cover Page Template

- Memorandum of Understanding text was updated



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Noise Study Report

Florida Department of Transportation

District X

Project Title

Limits of Project

County, Florida

Financial Management Number: XXXXX-X

ETDM Number: XXXXXX

Date

The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being, or have been, carried out by the Florida Department of Transportation (FDOT) pursuant to 23 U.S.C. § 327 and a Memorandum of Understanding dated May 26, 2022, and executed by the Federal Highway Administration and FDOT.

(Signature Block as Needed)

Figure 18-10 Sample Noise Study Report Cover Sheet for Federal Projects

Highway Traffic Noise 18-51

Update of References

- Added
  - FDOT Existing Noise Barrier Methodology
  - FDOT Special Land Use Methodology
  - FDOT Traffic Data Spreadsheet
- Updated
  - FHWA and FDOT MOU
  - FDOT Design Manual
- Removed
  - Previous (2009) Special Land Use Methodology

18.3 REFERENCES

FHWA. FHWA's Noise Policy FAQs - Frequently Asked Questions. https://www.fhwa.dot.gov/Environment/noise/regulations_and_guidance/faq_nois.cfm

FHWA. Report FHWA-HEP-06-015, FHWA Highway Construction Noise Handbook: Final Report, August 2006. https://rosap.ntl.bts.gov/view/dot/8837

FHWA. Report FHWA-HEP-05-054, FHWA Roadway Construction Noise Model User's Guide: Final Report, January 2006. http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf

FHWA. Report Number FHWA-PD-96-009, FHWA Traffic Noise Model User's Guide (Version 2.5 Addendum). April 2004. 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

FHWA. Report Number FHWA-HEP-18-065, Noise Measurement Handbook. June, 2018. https://www.fhwa.dot.gov/environment/noise/measurement/handbook.cfm

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/

First Renewal of the Memorandum of Understanding Between FHWA and FDOT Concerning the State of Florida's Participation in the Surface Transportation Project Delivery Program Pursuant to 23 U.S.C. 327, May 26, 2022. https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/environment/pubs/nepa_assign/florida-327-mou---signed.pdf?sfvrsn=202c70b4_2

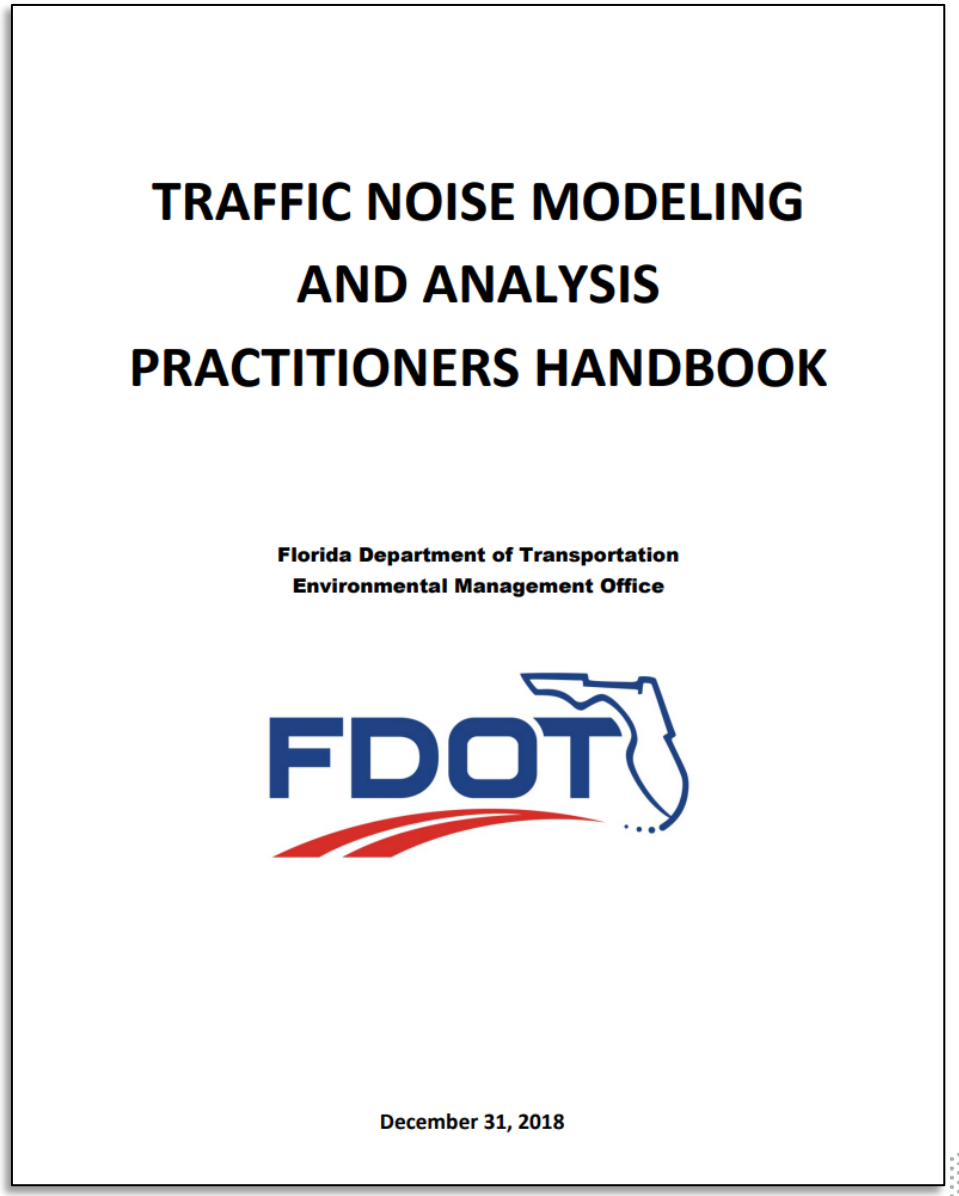
FRA. Guidance on Assessing Noise and Vibration Impacts. https://www.fra.dot.gov/Page/P0216

FTA. Report Number 0123, Transit Noise and Vibration Impact Assessment Manual. September 2018. https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf

FDOT. A Methodology to Evaluate Highway Traffic Noise at Special Land Uses, January 2024. https://www.fdot.gov/environment/publications.shtm

PD&E Manual – Future Updates

- Expected 2025 Edits:
  - Moving guidance from PD&E Manual → Noise Practitioner's Handbook



Questions?

Contact

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Tallahassee Central Office Noise Specialist

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Email: neil.campbell@dot.state.fl.us

Thank you for your participation!