Environmental Handbook

Traffic Noise

This handbook provides a regulatory background and outlines the process steps necessary to comply with the Texas Department of Transportation’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise.
# Table of Contents

1.0 Introduction .......................................................................................................................... 3
   1.1 TxDOT Policy ....................................................................................................................... 3
   1.2 Responsible Party ............................................................................................................... 3
   1.3 Applicable Project Types .................................................................................................... 3
   1.4 Critical Sequencing ............................................................................................................ 3
   1.5 Helpful Suggestions ........................................................................................................... 3
   1.6 Additional Resources ......................................................................................................... 4

2.0 Regulatory Overview ............................................................................................................. 4
   2.1 National Environmental Policy Act .................................................................................... 4
   2.2 Federal Aid Highway Act of 1970 ..................................................................................... 4
   2.3 Paths to Compliance ......................................................................................................... 4

3.0 Procedural Requirements ..................................................................................................... 7

4.0 Project Scoping and Planning ............................................................................................... 8

5.0 Type I Projects ...................................................................................................................... 8

6.0 Traffic Noise Analysis .......................................................................................................... 9

7.0 Noise Abatement Measures ................................................................................................ 9

8.0 Public Participation: Traffic Noise Workshop ...................................................................... 10

9.0 Finalize Design .................................................................................................................... 10

10.0 Documentation .................................................................................................................... 10
   10.1 Traffic Noise Report .......................................................................................................... 11
   10.2 Project File ....................................................................................................................... 11
   10.3 NEPA and Traffic Noise Analysis Documentation .......................................................... 12

11.0 Review and Approval Process ............................................................................................ 13

12.0 Glossary .............................................................................................................................. 14

13.0 Abbreviation and Acronyms .............................................................................................. 16

Appendix A .................................................................................................................................... 17
1.0 Introduction

This handbook provides a regulatory background and outlines the process steps necessary to comply with the sections of National Environmental Policy Act (NEPA) that address the avoidance and mitigation of traffic noise impacts and Federal Highway Aid Act. The act mandated the Federal Highway Administration (FHWA) to develop and promulgate the Procedures for Abatement of Highway Traffic Noise and Construction Noise. Compliance with the FHWA procedures is a prerequisite for granting federal-aid highway funds or FHWA approvals for construction or reconstruction of a roadway. Regardless of funding, all projects must undergo the same process for a noise analysis and ultimately must be approved by Texas Department of Transportation (TxDOT).

1.1 TxDOT Policy

It is TxDOT policy to comply with the NEPA and FHWA requirements regarding traffic noise by providing procedures for noise studies and noise abatement measures to help protect the public’s health, welfare, and livability; to supply noise abatement criteria; and to establish requirements for information to be given to local officials for use in the planning and design of highways.

1.2 Responsible Party

Various documentation, compliance, coordination, and approval responsibilities are assigned to the project sponsor and the department delegate for each project. The project sponsor is the party that is pursuing approval of the project, and may be a TxDOT district or local municipality. The department delegate may be a district or the TxDOT Environmental Affairs Division (ENV). Refer to the project scope for assignment of these roles and responsibilities. The project sponsor is responsible for providing material for and management of the project file. Specific duties of the TxDOT district offices and TxDOT ENV are outlined in TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

1.3 Applicable Project Types

Compliance with the procedures described in the 2011 TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit, is required for all Type I projects, regardless of funding source. If any portion of a project is determined to meet the definition of a Type I project, then the entire project within the logical termini is a Type I project.

1.4 Critical Sequencing

Traffic noise modeling requires roadway alignment(s) with the proposed elevations, number of proposed lanes, existing and proposed right of way (ROW) locations, and traffic volume data - approved by TxDOT’s Transportation Planning and Programming Division (TPP) - before the analysis can be completed. Additionally, if traffic noise abatement is proposed, public participation will be required prior to submitting proposed noise abatement for final design.

1.5 Helpful Suggestions

As outlined in TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise available online in the TxDOT Traffic Noise Toolkit, any traffic noise analysis, regardless of funding source, must use the current FHWA-approved version of the Traffic Noise Model (TNM). Familiarity
with basic acoustics and TNM is recommended. TNM training courses are available through TxDOT ENV, the National Highway Institute, and other private companies.

1.6 Additional Resources

- FHWA’s Highway Traffic Noise Website
- FHWA’s current Traffic Noise Model (TNM) and guidance are available for download.

2.0 Regulatory Overview

The following section outlines the regulations that drive the TxDOT policy and procedures related to traffic noise analysis and abatement. The federal regulations for traffic noise analysis are codified at 23 CFR 772, and TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise reflects these requirements and is available online in the TxDOT Traffic Noise Toolkit.

2.1 National Environmental Policy Act

The NEPA was passed in 1969 (with subsequent amendments) and is codified in the United States Code (USC) at 42 USC 4321. The act requires federal agencies to undertake certain analyses for “major Federal actions significantly affecting the quality of the human environment,” including an assessment of the environmental impact of the proposed action, any adverse environmental effects which cannot be avoided, and alternatives to the proposed action, among other considerations. NEPA also established the Council on Environmental Quality (CEQ) to oversee federal actions under the act. NEPA provides the federal government broad authority and responsibility for evaluating and mitigating adverse environmental effects, including roadway noise.

2.2 Federal Aid Highway Act of 1970

This act mandates FHWA to develop and promulgate guidelines and standards for highway noise levels for various land use activities and, for all proposed federal-aid roadway projects, that plans and specifications include adequate measures to implement the noise standards. The noise requirements of this act are mandated in 23 USC 109(h) and (i).

The standards called for in 23 USC 109(h) and (i) are codified in 23 CFR 772. Procedures for Abatement of Highway Traffic Noise and Construction Noise. Compliance with these regulations is a prerequisite for granting federal-aid highway funds or FHWA approvals for construction or reconstruction of a roadway. These regulations describe the federal procedures for abatement of highway traffic and construction noise and include highway traffic noise prediction and analyses requirements, noise abatement criteria, and requirements for informing local officials. All highway projects developed in conformance with these regulations are deemed to be in accordance with the FHWA noise standards. TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit, incorporates the requirements of 23 CFR 772.

2.3 Paths to Compliance

For compliance with 23 CFR 772 and TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit, the proposed Type I project may fall within one of the following categories, or paths to compliance. No matter which
compliance path is followed, if undeveloped land is adjacent to the Type I project, then impact contours must be derived for future planning purposes.

- **Determination that no receivers are impacted** – This determination requires a traffic noise analysis, an approval of the determination, and documentation supporting the determination and its approval. However, it does not require public participation.

- **Determination that receivers are impacted but no feasible and reasonable abatement measures are included** – This determination requires a traffic noise analysis, consideration of abatement measures, a determination that no feasible and reasonable abatement measures are possible, an approval of the impact and abatement determinations, and documentation supporting the determinations. However, it does not require public participation.

- **Determination that receivers are impacted but feasible and reasonable abatement measures have been included and approved** – This determination requires a traffic noise analysis, consideration of abatement measures, an approval of the impact determination, an approval of the abatement measures, public participation in the form of a noise workshop, and supporting documentation.
Figure 1

Traffic Noise Compliance Process

**Field Activities**

**BEGIN:** Is the project a Type 1 roadway project?

- YES: Conduct a field survey to identify traffic noise receivers and collect background noise levels.
- NO: STOP: Traffic Noise Analysis not required.

**STOP:** Traffic Noise Analysis not required.

- YES: Conduct a field survey to identify traffic noise receivers.

**Calculate predicted traffic noise levels.**

**Calculate existing traffic noise levels.**

**Calculate traffic noise impact distances for best estimates of future design year noise levels for undeveloped properties.**

**Evaluate reasonability and feasibility of proposed traffic noise abatement for impacted receivers.**

**Are there impacted noise receivers?**

- YES: Prepare documentation report and supporting project files.
- NO: **STOP:** Documentation is complete, no public involvement required. After clearance, send letters to local officials.

**Review and approval by department delegate.**

**Is traffic noise abatement proposed?**

- YES: Provide public notice.
- NO: Conduct traffic noise workshop.

**Address public comments; notify public of any changes to proposed design.**

**STOP:** Documentation is complete; submit proposed traffic noise abatement for final design. After clearance, send letters to local officials.
3.0 Procedural Requirements

Detailed procedures are provided in TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit. The general procedural requirements for traffic noise analysis outlined below and in Figure 1 were developed by TxDOT to assist practitioners in conducting noise analysis in accordance with 23 CFR 772. However, not every step will be required for every project. Proceed step by step through the process as indicated by one of the four compliance paths. For example, if no portion of the proposed project is a Type I project, then only Step One is necessary.

**Step One** – Determine whether any portion of the proposed project is a Type I project. If not, the process is complete.

**Step Two** – Conduct a field survey to identify the traffic noise receivers, and, for projects proposed on a new location, collect background noise levels using a Type I sound meter.

**Step Three** – For projects on an existing alignment, determine the existing traffic noise levels and the predicted traffic noise levels using the latest version of TNM. For new projects on a new location, determine the predicted traffic noise levels. All traffic noise modeling and analysis should be conducted in accordance with 23 CFR 772 and TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit, and should use the current traffic noise model approved by FHWA.

**Step Four** – Determine if any receivers will be impacted, and, prepare a technical report documenting the analysis. Submit the report to the department delegate and if the department delegate approves the determination that no receivers are impacted, then skip to Step Nine.

**Step Five** – If traffic noise impacts are predicted to occur at one or more receivers, consider proposed traffic noise abatement measures to mitigate and/or abate the traffic noise impacts for each impacted receiver, and evaluate each measure for feasibility and reasonableness regarding traffic noise impact reduction.

**Step Six** – If traffic noise abatement is proposed, conduct a Traffic Noise Workshop to inform the public about a noise abatement proposal and/or to solicit public viewpoints regarding a noise abatement proposal for property owners adjacent to proposed abatement measures.

**Step Seven** – Address public comments from the Traffic Noise Workshop, and notify the public of any changes, if any, to the proposed design.

**Step Eight** – Finalize design of any abatement measures and coordinate those measures with the project engineers for incorporation into the final roadway design.

**Step Nine** – Identify land uses or activities that may be affected by noise from construction of the project and determine the measures that are needed in the plans and specification to minimize or eliminate adverse construction noise impacts to the community.

**Step Ten** – To minimize future traffic noise impacts on currently undeveloped lands of Type I projects, TxDOT shall inform local officials (in urban areas, the mayor’s office and in rural areas, the county judge’s office) within whose jurisdiction the highway project is located of: (1) Noise compatible planning concepts, (2) The best estimation of the future design year noise levels at various distances from the edge of the nearest travel lane of the highway improvement and the (3) Date of Public Knowledge. The date of approval of the Categorical Exclusion (CE), the issuance of the Finding of No Significant Impact (FONSI), or the Record of Decision (ROD) establishes the “date of public knowledge” and determines the date when FHWA and highway agencies are no longer responsible for providing highway traffic noise
abatement for new development which occurs adjacent to the proposed highway project. The "date of public knowledge" cannot precede the date of approval of the CE, FONSI, or the ROD.

A copy of the noise analysis documentation containing the aforementioned information shall be provided to local officials with a cover letter explaining the purpose of the noise planning information. It should be noted that EA and EIS level documents would satisfy this requirement because the environmental documents are made available through the NOA process via the notices that are written for the public hearing or opportunity for public hearing.

### 4.0 Project Scoping and Planning

Comprehensive planning and coordination should be accomplished as early as possible in the project development process to ensure that comparative analyses of all transportation alternatives include consideration for minimizing or avoiding traffic noise impacts. Once the determination has been made that a project is a Type I project, a field visit is necessary to ascertain whether there are adjacent noise sensitive land uses. Mapping these locations at this time will enable the noise analysis to proceed. With this knowledge, performing the risk assessment will aid in the scoping process.

### 5.0 Type I Projects

A traffic noise analysis is required for all Type I projects, regardless of funding source. If any portion of a project is determined to meet the definition of a Type I project, then the entire project is a Type I project. Therefore, the first step of the compliance process is to determine whether a proposed project is a Type I project.

A Type I roadway project is one that involves:

- The construction of a highway on new location or,
- The physical alteration of an existing highway where there is either:
  - Substantial horizontal alteration which occurs when a project halves the distance between the traffic noise source and the closest receiver between the existing condition and the future build condition; or,
  - Substantial vertical alteration which occurs when a project removes shielding thereby exposing the line-of-sight between the receiver and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receiver; or,
  - 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, bus lane, or truck climbing lane; or,
  - The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,
  - The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,
  - Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
  - The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.
Note regarding Super 2 projects: Because Super 2 projects include the addition of an auxiliary lane, these are a Type I project. However, a full analysis may not be necessary. Please consult with ENV’s SME to determine the level of analysis necessary.

6.0 Traffic Noise Analysis

Once it has been determined that a proposed project is a Type I project, a traffic noise analysis must be conducted to determine whether any receivers are impacted. Generally, a traffic noise analysis consists of field studies, prediction of future traffic noise levels for all proposed roadway alternatives, and identification of impacted receivers. The traffic noise analysis should be conducted in accordance with 23 CFR 772 and TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit, and the analysis must use the current FHWA-approved TNM.

There are two types of field surveys used to determine the existing noise levels of a proposed project. For projects on a new alignment, field measurements should be taken to determine the background noise levels. For projects on existing alignments, field surveys should be conducted to identify any traffic noise receivers, and the existing traffic noise levels should be measured according to FHWA’s Measurement of Highway-Related Noise.

For projects on a new alignment and on an existing alignment, the next step of the analysis is to use a traffic noise model to calculate a best estimation of the future design year noise levels. In predicting noise levels and assessing noise impacts, traffic characteristics that would yield the most severe traffic noise impact for the design year shall be used. If no receivers are impacted, the noise levels for undeveloped properties should be calculated at various distances from the edge of the nearest travel lane of the highway improvement. If a receiver is impacted, traffic noise abatement measures for the impacted receivers must be developed and considered.

7.0 Noise Abatement Measures

Once it has been determined that traffic noise impacts are predicted to occur at one or more receivers, noise abatement measures must be considered to mitigate or abate the traffic noise impacts. Each proposed traffic noise abatement measure should be evaluated for acoustic feasibility. A wall that is acoustically feasibility would meet the feasible goal of reducing traffic noise by -5 dB at greater than 50% of the noise receivers adjacent to the project and meet the reasonable noise reduction goal of -7 dB at one of more of the adjacent noise receivers. For additional guidance concerning the evaluation of abatement measures, refer to the TxDOT Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

Traffic noise abatement measures may include alteration of the vertical or horizontal alignment, acquisition of buffering land, structure insulation for impacted interior receivers, and/or construction of noise barriers. In abating traffic noise impacts, project planners should primarily consider exterior areas where frequent human use occurs. Noise abatement measures shall be determined and analyzed to abate identified impacts – 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. At a minimum, consider noise abatement in the form of a noise barrier located within the project ROW.

After considering the noise abatement measures, an environmental report must be prepared, and the TxDOT Traffic Noise Toolkit provides current examples of traffic noise analysis and abatement.
Traffic Noise

documentation. For each noise abatement measure determined to be acoustically feasible and reasonable, provide sufficient information in the environmental report to justify that a proposed abatement measure is both acoustically feasible and reasonable. Provide an initial proposal of noise abatement with the location, dimensions, number of benefitted receivers, total costs, cost per benefitted receiver, and exhibits in the environmental documentation. If there are no available feasible and reasonable abatement measures, the report should outline what measures were considered and rejected.

Once the report has been prepared, the project sponsor must submit the environmental report to TxDOT ENV to allow TxDOT ENV to review and approve the traffic noise analysis results. It is important to note that this is not the final approval of the projects traffic noise impacts; this is only the approval of the determination concerning whether or not public participation is required. If TxDOT approves a determination that no receivers were impacted or that a receiver was impacted but there is no feasible and reasonable abatement measures, the compliance process is complete. If traffic noise abatement measures are proposed for the project, then it is necessary to conduct public participation.

8.0 Public Participation: Traffic Noise Workshop

If it is determined that a proposed project impacts receivers and feasible and reasonable abatement measures have been identified, public participation is required. Public participation must be conducted in the form of a traffic noise workshop offered to property owners adjacent to proposed abatement measures. For additional guidance concerning conducting a workshop, refer to the TxDOT Traffic Noise Toolkit.

At the workshop, property owners adjacent to proposed abatement measures may provide input on the traffic noise abatement to be included in the final design, including whether the abatement measures are desirable. This discussion should address the results of the noise studies and solicit input on the traffic noise abatement to be included in the final design. If the reasonableness or feasibility of a proposed abatement measure changes due to conflicts with utilities or other design details not typically available until final design, additional notification should be given to affected property owners to explain the changes.

9.0 Finalize Design

Following public participation, the proposed traffic noise abatement measures need to be coordinated with the project engineers for incorporation into the final roadway design. Once constructed, the details of the built noise abatement should be retained in the project file.

10.0 Documentation

The project sponsor must prepare one of the following statements and retain it in the project file to record the determinations that were made concerning the impacts of the proposed Type I project.

- Statement that no receivers are impacted
- Statement that receivers are impacted but no feasible and reasonable abatement measures are included
- Statement that receivers are impacted but feasible and reasonable abatement measures are included and approved
Current examples and development tools for traffic noise analysis and abatement statements are available in the TxDOT Traffic Noise Toolkit.

10.1 Traffic Noise Report

Once it has been determined that a proposed project is a Type I project, a traffic noise analysis must be conducted and a traffic noise environmental report must be prepared. The environmental report documents how the analysis was conducted and includes a summary of the results. The report is designed to provide comprehensive information to the public, local government, and elected officials.

10.2 Project File

The project file is the written record documenting the basis for one of the following noise determinations: the proposed project impacts no receivers, the proposed project impacts receivers but no feasible and prudent abatement measures are available, or that the proposed project impacts receivers and includes feasible and reasonable abatement measures.

For proposed projects that are not a Type I projects, the following items may be included in the project file.

- A project layout map showing the project’s proposed ROW
- Existing and proposed schematics for the project
- Existing and proposed typical sections for the project

For proposed Type I projects that do not impact receivers, the following items should be included in the project file.

- Traffic noise models for existing and proposed models with results for all roadways, receivers, and other supporting files used for noise analysis determination
- A noise technical report documenting the results of the analysis
- A project layout map showing the project’s proposed ROW
- Existing and proposed schematics for the project
- Existing and proposed typical sections for the project
- Specific files and parameters required for noise documentation as specified in TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

For proposed Type I projects that impact receivers and do not include feasible and reasonable abatement, the following items should be included in the project file.

- A project layout map showing the project’s proposed ROW
- Existing and proposed schematics for the project
- Existing and proposed typical sections for the project
- Identification of locations where noise impacts are predicted to occur
- Traffic noise models (existing and proposed models with results) of all roadways, receivers, traffic noise abatement considered, feasible and reasonable worksheets and other supporting files used for noise analysis determination and specific files and parameters required for the noise analysis.
Traffic Noise

documentation, as specified in TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

- A noise technical report documenting the results of the analysis
- A statement of likelihood, since feasibility and reasonableness determinations may change due to changes in project design after approval of the environmental document.

For proposed project that are Type I projects with impacted receivers and feasible and reasonable abatement, the following items should be included in the project file.

- A project layout map showing the project’s proposed ROW
- Existing and proposed schematics for the project
- Existing and Proposed Typical Sections for the project
- Identification of locations where noise impacts are predicted to occur
- Traffic noise models (existing and proposed models with results) of all roadways, receivers, traffic noise abatement, feasible and reasonable worksheets and other supporting files used for noise analysis determination. Specific files and parameters required for the noise documentation are specified in TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

- A technical noise report documenting the results of the analysis
- A statement of likelihood, since feasibility and reasonableness determinations may change due to changes in project design after approval of the environmental review document. The statement of likelihood shall include the preliminary location and physical description of these measures and indicate that final recommendations for the construction of an abatement measure are determined during the completion of the project’s final design and the traffic noise workshop.

- Documentation of the completed traffic noise workshops shall include a summary of the materials presented, comments from the public and associated responses, and the results of the ballots for each proposed barrier.

10.3 NEPA and Traffic Noise Analysis Documentation

Because traffic noise impacts are ultimately approved through the NEPA process, the statements included in the project file also can be used to provide documentation of the noise analysis in environmental review document. For environmental clearance, this analysis shall be completed to the extent that design information on the roadway alternative(s) under study in the environmental review document is available at the time the environmental review document is completed. A statement of likelihood shall be included in the environmental document since feasibility and reasonableness determinations may change due to changes in project design after approval of the environmental document. The statement of likelihood shall include the preliminary location and physical description of noise abatement measures determined feasible and reasonable in the preliminary analysis. The statement of likelihood also shall indicate that final recommendations on the construction of abatement measure(s) as determined during the completion of the project's final design and the traffic noise workshop.
11.0 Review and Approval Process

There are two stages of approval for traffic noise impacts. The first review and approval of the traffic noise analysis results, outlined in Section 7.0, concerns the results of the traffic noise analysis and the determinations it supports, not the review and approval of the proposed project itself. The approval of the proposed project is granted through the NEPA process. The statements and report developed as directed by the compliance process outlined in this handbook and listed in the documentation section may be dropped into a NEPA environmental review document or referenced as appropriate.
12.0 Glossary

The following terms have been adopted by FHWA and/or TxDOT for noise analyses and are listed in 23 CFR 772.5 and TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

**Abatement** – any positive action taken to reduce the impact of roadway traffic noise

**Abatement Measure** – typically a noise barrier in the form of a noise wall – Other noise abatement measures that can be considered are, traffic management, alteration of horizontal and vertical alignment, acquisition of real property to serve as a buffer zone, insulation of NAC Category D structures, or berms.

**Approach** – defined as 1 dB(A) below the FHWA Noise Abatement Criteria under the “Absolute Criterion”

**Benefitted Receiver** – the recipient of an abatement measure that receives a noise reduction at or above the minimum threshold noise level, but not to exceed the highway agency’s reasonableness design goal – Receivers are also sometimes referred to as *receivers*, but receiver is the preferred term.

**Decibel (dB)** – the basic unit for measuring sound pressure levels

**Design Year** – the year used as a basis for calculating predicted (future) noise levels – normally 20 years from the current (existing) year.

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

**Feasibility** – the determination of whether it is possible to build an abatement measure given site constraints and whether the abatement measure provides a minimum reduction in noise levels – Feasibility is limited by the following.

1. Topography
2. Access requirements for driveways, ramps, etc.
3. The presence of local cross streets
4. Other noise sources in the area (e.g. aircraft, rail, commercial and industrial noise sources)
5. Addressing the project purpose
6. Drainage
7. Utilities
8. Maintenance
9. Noise reduction

A noise abatement measure is NOT FEASIBLE unless the measure achieves a noise reduction of at least 5 dB(A) at greater than 50% of first row impacted receivers. Blocking the line of site between the source and receiver usually provides a 5 dB(A) noise reduction.

**Impacted Receiver** – the recipient that has a traffic noise impact – Receivers are also sometimes referred to as *receivers*, but receiver is the preferred term.

**Noise Barrier** – a physical obstruction constructed between the highway noise source and the noise-sensitive receiver(s) that lowers the noise level, including standalone noise walls, noise berms (earth or other material), and combination berm/wall systems
Traffic Noise

**Noise Abatement Criteria (NAC)** – absolute sound levels, provided by FHWA, used to determine when a noise impact occurs – These are not used as a design goal for a noise abatement measure. These levels for noise sensitive land uses can be found in Table 6 of TxDOT’s Guidelines for the Analysis and Abatement of Roadway Traffic Noise, which is available online in the TxDOT Traffic Noise Toolkit.

**Predicted Noise Level** – the level of traffic noise modeled at a receiver in the “design year” of a proposed roadway project

**Property Owner** – an individual or group of individuals that holds a title, deed, or other legal documentation of ownership of a property or a residence

**Reasonableness** – The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure – A determination of reasonableness for abatement measures will include consideration of the following range of factors.

- Cost Effectiveness
- Noise reduction design goal
- Views of Benefitted Receivers

**Receiver** – a discrete or representative location of a noise sensitive area(s), for any of the land uses described in FHWA’s Noise Abatement Criteria (NAC) – Receivers are also sometimes referred to as receptors, but receiver is the preferred term.

**Statement of Likelihood** – a statement provided in the environmental clearance document based on the feasibility and reasonableness analysis completed at the time the environmental document is being approved

**Substantial Horizontal Alteration** – A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition

**Substantial Vertical Alteration** – A project that removes shielding therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor

**Traffic Noise Impacts** – Design year build condition noise levels that approach or exceed the NAC for the future build condition; or design year build condition noise levels that create a substantial noise increase over existing noise levels

**Type I Project** – a proposed roadway project for:

1. The construction of a highway on a new location
2. The physical alteration of an existing highway where there is either a substantial horizontal or vertical alteration;
3. The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, HOT lane, bus lane, or truck climbing lane;
4. The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane;
5. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange;
6. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane
7. The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza; or,
8. If a project is determined to be a Type I project, under this definition, then the entire project area as defined in the environmental document is a Type I project.

**Type II Project** – a federal or federal-aid highway project for noise abatement on an existing highway (retrofit project)

**Type III Project** – a federal or federal-aid highway project that does not meet the classifications of a Type I or Type II project

### 13.0 Abbreviation and Acronyms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CE</td>
<td>Categorical Exclusion</td>
</tr>
<tr>
<td>CEQ</td>
<td>Council on Environmental Quality</td>
</tr>
<tr>
<td>CFR</td>
<td>Code of Federal Regulations</td>
</tr>
<tr>
<td>dB</td>
<td>Decibel</td>
</tr>
<tr>
<td>ENV</td>
<td>Environmental Affairs Division of TxDOT</td>
</tr>
<tr>
<td>FHWA</td>
<td>Federal Highways Administration</td>
</tr>
<tr>
<td>FONSI</td>
<td>Finding of No Significant Impact</td>
</tr>
<tr>
<td>HOT</td>
<td>High Occupancy Toll</td>
</tr>
<tr>
<td>HOV</td>
<td>High Occupancy Vehicle</td>
</tr>
<tr>
<td>NAC</td>
<td>Noise Abatement Criteria</td>
</tr>
<tr>
<td>NEPA</td>
<td>National Environmental Policy Act</td>
</tr>
<tr>
<td>NHI</td>
<td>National Highway Institute</td>
</tr>
<tr>
<td>ROD</td>
<td>Record of Decision</td>
</tr>
<tr>
<td>ROW</td>
<td>Right of Way</td>
</tr>
<tr>
<td>SME</td>
<td>Subject Matter Expert</td>
</tr>
<tr>
<td>TNM</td>
<td>Traffic Noise Model</td>
</tr>
<tr>
<td>TPP</td>
<td>Transportation Planning and Programming</td>
</tr>
<tr>
<td>TxDOT</td>
<td>Texas Department of Transportation</td>
</tr>
<tr>
<td>USC</td>
<td>United States Code</td>
</tr>
<tr>
<td>USDOT</td>
<td>U.S. Department of Transportation</td>
</tr>
</tbody>
</table>
Appendix A

The following table shows the revision history for this guidance document.

<table>
<thead>
<tr>
<th>Effective Date Month, Year</th>
<th>Reason for and Description of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2018</td>
<td>Version 4 release. Provide clarification of the requirements to inform public officials of noise contours in undeveloped areas and updated the process flowchart.</td>
</tr>
<tr>
<td>January 2016</td>
<td>Version 3 release. Provides information regarding the requirements to inform public officials of noise contours in undeveloped areas as well as a link to a preformatted template letter to be used for mailings to these entities.</td>
</tr>
<tr>
<td>January 15, 2015</td>
<td>Version 2 release. Revised as part of corrective action needed to address problems identified during a program review mandated by the FHWA/TxDOT memorandum of understanding for categorically excluded projects. Removed the following statement in section 10.0 for non-Type I projects: Statement that the project is not a Type I project.</td>
</tr>
<tr>
<td>May 2014</td>
<td>Version 1 release.</td>
</tr>
</tbody>
</table>