

# Noise Analysis and Abatement Policy

April 2024

# NEBRASKA

Good Life. Great Journey.

## DEPARTMENT OF TRANSPORTATION



Nebraska Department of Transportation  
Director/State Engineer

4-8-24

Date

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## Attachments

Attachment 1. Noise Abatement Criteria Table
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## Acronyms and Terms

Acronym or Term	Definition
Acoustic Feasibility	NDOT has established that a minimum of 60 percent of front-row impacted receptors directly behind the noise barrier (noise barrier must extend entirely across impacted receptor's property line) must achieve a 5 dB(A) noise reduction for noise abatement to be feasible.
Benefited Receptor	The recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dB(A).
CFR	Code of Federal Regulations
dB(A)	A-weighted sound level in decibels
Date of Public Knowledge	The approval date of the Categorical Exclusion (CE), the Finding of No Significant Impact (FONSI), or the Record of Decision (ROD), defined in 23 CFR part 772.
Design Year	The future year used to estimate the probable traffic volume for which a highway is designed.
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 combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.
FHWA	Federal Highway Administration
ft <sup>2</sup>	square foot/feet
Impacted Receptor	The recipient that has a traffic noise impact. For levels for impact determination see Noise Abatement Criteria (NAC) Table 1.
Multi-family Dwelling	A residential structure containing more than one residence. Each residence in a multi-family dwelling shall be counted as one receptor when determining impacted and benefited receptors.
NDOT	Nebraska Department of Transportation
NDOT Noise PQS	NDOT Noise Professionally Qualified Staff
NEPA	National Environmental Policy Act
Noise Abatement Criteria (NAC)	Traffic noise levels set by the FHWA to determine a traffic noise impact, or the absolute levels where abatement must be considered. Based on the land use adjacent to traffic noise, the NAC is organized by activity categories A–G each with a specific noise level that determines an impact. (See 23 CFR 772.)
Noise Barrier	A physical obstruction that is constructed between the highway noise source and the noise sensitive receptor(s) that lowers the noise level, including standalone noise walls, noise berms (earth or other material), and combination berm/wall systems.
Noise Reduction Design Goal (Reasonable)	NDOT has established that a minimum of 50 percent of front-row benefited receptors directly behind the noise barrier (noise barrier must extend entirely across benefited receptor's property line) must achieve a 7 dB(A) noise reduction for noise abatement to be reasonable.
Noise Study Area (NSA)	A group or grouping of receptors into common areas of similar noise influences throughout the entire project limits.
Permitted	A definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit.

Acronym or Term	Definition
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.
Receiver	A receiver location is an area where analysts measure and/or model highway traffic noise levels. For purposes of this policy and to avoid confusion, the term "modeling point" will be used when referring to receivers and may be representative of one or more receptors.
Receptor	A discrete or representative location of a noise sensitive area(s), for any land uses listed in the NAC table contained in the attachment to the NDOT Noise Analysis and Abatement Policy.
Residence	A single-family dwelling or a unit in a multi-family dwelling.
Substantial Noise Increase	One of two types of highway traffic noise impacts. For a Type I project, NDOT has established that an increase in noise levels of 15 dB(A) in the design year over the existing noise level is classified as a substantial noise increase.
Traffic Noise Impacts	Design year build condition noise levels that approach or exceed the NAC listed in the attachment to the NDOT Noise Analysis and Abatement Policy for the future build condition; or design year build condition noise levels that create a substantial noise increase over existing noise levels. For reporting purposes, all noise levels should be rounded to the nearest whole number.
TNM	Traffic Noise Model
Type I Project	<p>FHWA regulations (23 CFR 772.5) defines a Type I Project as:</p> <ol style="list-style-type: none"> <li>(1) The construction of a highway on new location; or,</li> <li>(2) The physical alteration of an existing highway where there is either: <ol style="list-style-type: none"> <li>(i) 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; or,</li> <li>(ii) 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; or,</li> </ol> </li> <li>(3) The addition of a through-traffic lane(s), including 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,</li> <li>(4) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or</li> <li>(5) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,</li> <li>(6) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,</li> <li>(7) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot, or toll plaza.</li> <li>(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.</li> </ol>
Type II Project	A federal or federal-aid highway project for noise abatement on an existing highway. NDOT does not have a Type II program.

# 1. Introduction

This document contains the Nebraska Department of Transportation (NDOT) policy on highway traffic noise and construction noise. This policy describes NDOT's implementation of the requirements of the Federal Highway Administration (FHWA) Noise Standard at 23 Code of Federal Regulations (CFR) Part 772. This policy was developed by NDOT and reviewed and concurred with by FHWA.

During the rapid expansion of the Interstate Highway System and other roadways in the 20th century, communities began to recognize that highway traffic noise and construction noise had become important environmental impacts. In the 1972 Federal-aid Highway Act, Congress required FHWA to develop a noise standard for new federal-aid highway projects. While providing national criteria and requirements for all highway agencies, the FHWA Noise Standard gives highway agencies flexibility that reflects state-specific attitudes and objectives in approaching the problem of highway traffic and construction noise. This document contains NDOT's policy on how highway traffic noise impacts are defined, noise abatement is evaluated, noise abatement decisions are made, and how noise impacts/abatement are decided for highway projects.

In addition to defining traffic noise impacts, the FHWA Noise Standard requires that noise abatement measures be considered when traffic noise impacts are identified for Type I federal projects. Noise abatement measures that are found to be feasible and reasonable must be constructed for such projects. Feasible and reasonable noise abatement measures are eligible for federal-aid participation at the same ratio or percentage as other eligible project costs.

## 1.1 Purpose

This policy describes the NDOT program to implement 23 CFR 772. Where FHWA has given NDOT flexibility in implementing the standard, this policy describes the NDOT approach to implementation.

## 1.2 Noise Standards

This policy outlines the NDOT program to implement the FHWA Noise Standards found in 23 CFR 772. They include traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials.





## 2. Applicability

This policy applies to all Type I federal highway projects in the state; that is, any projects that receive federal-aid funds or are otherwise subject to FHWA approval. They include federal projects that are administered by other agencies as well as NDOT.

If there are any questions about whether a project is subject to this policy or the FHWA Noise Standard, contact the NDOT Noise and Air section at 402-479-4312/4766. Due to the long lead time to complete a traffic noise study, it is critical to determine early in project scoping if a noise study is necessary.

The requirements of this policy apply uniformly and consistently to all Type I federal projects throughout the state.

Type II Program. The State of Nebraska does not have a Type II program.



### 3. Traffic Noise Prediction

NDOT utilizes the FHWA Traffic Noise Model (TNM) as the method to predict traffic noise levels. Any noise analysis on a Type I Project must use approved FHWA TNM or any other model determined by FHWA to be consistent with the methodology of TNM. TNM Look-up tables cannot be used to predict noise levels on any project.

Future noise levels must be predicted for all reasonable alternatives under detailed study in the National Environmental Policy Act (NEPA) process using forecasted traffic volumes at least 20 years after the year of construction. Traffic conditions representing the worst-case noise hour are required as TNM inputs. The worst-case noise hour may not be the peak traffic hour in urban areas as congestion can slow traffic, which reduces noise levels. The NDOT *Traffic Noise Analysis Guidance Manual* provides additional information on determining the worst hourly noise condition. Average pavement type shall be used in the FHWA TNM unless NDOT substantiates the use of a different type for approval by the FHWA.

Refer to the *TNM Users Guide*, which can be found on the FHWA's website for instructional guidance and additional information on TNM parameters.



## 4. Analysis of Traffic Noise Impacts

Existing noise levels are determined by applying TNM when the noise is predominantly due to highway traffic during the peak noise hour. Field measurements are taken to validate the results of the traffic noise model and for proposed highways on new alignments where no highway currently exists. Field measurements must be taken at exterior areas of frequent human use or at the right-of-way line to establish the background noise levels for the area.

When field measurements are taken, an ANSI Type 1 or 2 noise meter shall be used per 23 CFR 772.11. The traffic will be counted during the noise readings and separated into three categories: autos, medium trucks, and heavy trucks. Three measurements at each monitoring location are preferred, with each measurement being at least 15 minutes in length for adequate measurement. Due to noise interference from high winds, noise meter readings are not taken in wind speeds that are 12 miles per hour or greater. In identifying noise impacts, the noise receptors will represent an exterior area of frequent human use. Noise modeling or field measurements will employ the noise modeling points at these locations. All measurements are performed in accordance with methodology presented in FHWA's *Noise Measurement Handbook*.

For Type I Projects, a traffic noise analysis is required for all build alternatives under detailed study in the NEPA process. This includes all reasonable alternatives that have been retained for detailed analysis in the categorical exclusion documentation, environmental assessment, or environmental impact statement and NOT rejected as unreasonable during the alternatives screening process.

For Tier 1 Environmental Impact Statements or other studies that will examine broad corridors, the appropriate scope and methodology of the noise analysis should be discussed with NDOT and other participating agencies early in the project planning process. A Preliminary Assessment may be performed during the alternative's selection process. This data will assist in selecting the preferred alternative and completing the noise study. If a Preliminary Assessment is performed, modeling for impacted receptors will be required. Modeling for abatement, if necessary, will occur for impacted receptors once the preferred alternative is chosen.

For reporting purposes all noise level results should be rounded to the nearest whole number as part of both the impact analysis as well as the abatement analysis. For model validation purposes, modeled and field-measured noise levels will be reported to the 1/10<sup>th</sup> of a decibel.

If any segment or component of an alternative meets the definition of a Type I Project, then the entire alternative is considered to be Type I and is subject to the noise analysis requirements. Contours for 66 and 71dBA must be included the entire length of the project.

For Type I Projects, the limits of the area included in a noise analysis are determined based not only on the extent of project improvements but also on the adjacent development and land use and must include all areas to be affected by project activities.

Possible noise receptors within the project should be identified using the following criteria:

- (1) Minimum distance to look for receptors will extend at least 300 feet radius from the edge of pavement.
- (2) If an impact is identified at 300 feet, the modeling area must be extended until a distance where impacted receptors are no longer identified is reached. Additionally, the noise modeling area must also account for any receptors that may be benefited from any evaluated noise abatement measures.
- (3) If no receptors are located within 300 feet, place a receptor at 300 feet. If impacts are found, the modeling area will be extended until impacts are no longer identified.

- (4) NDOT is required to identify all expected highway traffic noise impacts from the project. In cases where the roadway is on fill, the analysis area may need to be extended to ensure that all impacts are identified.

The noise analysis must include analysis for each Activity Category present in the study area. For a detailed, full listing of land uses, refer to the NAC Table included as an attachment to this document. The NDOT *Traffic Noise Analysis Guidance Manual* provides additional information on receptor placement for each of the activity categories discussed in the following sections.

#### 4.1 Activity Category A (lands on which serenity and quiet are of extraordinary significance and serve an important public need)

The highway agency must submit justifications to FHWA on a case-by-case basis to designate any lands as Category A.

#### 4.2 Activity Category B (exterior areas of single-family and multi-family dwellings)

This category consists of residential uses including both single family and multi-family dwellings, apartment buildings, mobile home parks, etc. The location of modeling points will be in the area of frequent human use. Placement of modeling points must be within 20 feet of the dwelling unit if there are no other areas of frequent human use and facing the noise source to represent the worst-case noise condition. In the case of multi-family dwellings, each dwelling unit will be counted as a receptor.

#### 4.3 Activity Category C (exterior areas of non-residential lands such as schools, parks, cemeteries, etc.)

The number of receptors analyzed in this category will be based upon the average frontage of the adjacent activity category B developments within the project limits. For example, if the average lot frontage of all the category B developments adjacent to the category C development is 50 feet wide, a category C development that has a frontage of 500 feet long would analyze 10 receptors. Modeling points will be placed at areas of frequent human use to represent the receptors and will be placed in the area that best represents the worst expected traffic noise condition as to prevent shielding by objects or buildings. If no areas of frequent use are distinguishable (such as open park land or cemeteries without benches, playground, etc.), a grid system will be used to determine modeling point placement as described in the NDOT *Traffic Noise Analysis Guidance Manual*.

#### 4.4 Activity Category D (interiors of Category C facilities)

NDOT shall conduct an indoor analysis after a determination is made that exterior abatement measures will not be feasible and reasonable. An indoor analysis shall only be done after exhausting all outdoor analysis options and requires advance coordination with the NDOT Noise Professionally Qualified Staff (PQS).

In situations where no exterior activities are to be affected by the traffic noise, or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities, the highway agency shall use Activity Category D as the basis of determining noise impacts. For indoor analysis, noise meter readings will be taken at areas of frequent human use closest to the noise source. The cost/benefitted receptor is calculated based on the cost of the interior noise abatement.

## 4.5 Activity Category E (exteriors of developed lands less sensitive to highway noise)

The number of receptors analyzed in this category will be based upon the length of the property frontage adjacent to the roadway. For every 200 feet of frontage that an activity category E occupies, a modeling point will be analyzed at a place of frequent human use representative of a receptor. For example, a category E development with a frontage width of 1000 feet would analyze five receptors at areas of frequent human use.

## 4.6 Activity Category F (land uses that are not sensitive to highway traffic noise)

No highway noise analysis is required under 23 CFR 772.

## 4.7 Activity Category G (undeveloped land)

Land that is permitted for development (that is, a building permit has been issued on or before the date of public knowledge), that land shall be analyzed under the Activity Category for that type of development.

For land that is not permitted for development by the date of public knowledge, the highway agency shall determine future noise levels pursuant to 23 CFR 772.17(a). The results shall be documented in the project environmental documentation and in the noise analysis report. At a minimum, the analysis should report the distance - measured from the proposed edge of the traveled way - to the Noise Abatement Criteria (NAC) for all exterior land use categories. Any noise abatement for such lands shall not be eligible for federal-aid participation.

## 4.8 NDOT Definition of "Approach Level" for NAC

NDOT has established that a noise level of one decibel less than the NAC in the FHWA Noise Standards constitutes "approaching" the NAC for Activity Categories A–E.

## 4.9 NDOT Definition of "Substantial Increase over Existing Noise Level"

NDOT has defined a substantial increase as 15 decibels [dB(A)] over existing noise levels. A substantial increase is independent of the absolute noise level. A substantial noise increase is a noise impact, even if the future noise level is lower than the NAC.

For Type I projects, receptors will be identified with street addresses when possible and always with numeric labels.





## 5. Analysis of Noise Abatement Measures

For Type I Projects, noise abatement measures shall be considered and evaluated for feasibility and reasonableness where predicted traffic noise levels approach or exceed the noise abatement criteria, or when the predicted traffic noise levels substantially exceed the existing noise levels. In abating traffic noise impacts, NDOT shall give primary consideration to exterior area of frequent human use. When considering abatement measures, NDOT factors the costs and effects of each abatement measure against the amount of benefit. Even if found feasible for a particular area, noise abatement may not be reasonable and will not be applied.

Barriers are considered as a possible means of noise abatement on Type I federally funded projects where traffic noise is predicted to impact adjacent land uses. Barriers are considered effective when blocking the "line of sight" between the noise source and the noise receptor. Although walls are the most commonly used type of noise barrier, earthen berms may be evaluated upon coordination with the NDOT Noise PQS.

The use of quieter pavements is not an acceptable federal-aid noise abatement measure for federally funded projects unless approved by the FHWA for a Quiet Pavement Pilot Program. The planting of vegetation is also not a form of federal-aid noise abatement given that only dense stands of evergreen trees at least 200 feet deep will reduce noise levels.



## 6. Feasibility and Reasonableness

### 6.1 Feasibility

#### 6.1.1 Acoustic Feasibility

A noise abatement device is considered acoustically feasible when 60 percent of the front-row impacted receptors located directly behind the noise wall achieves a 5 dB(A) noise reduction. Other significant noise sources within the project area will not prevent acoustic feasibility as long as the TNM demonstrates that a wall achieves the 5 dB(A) noise reduction from traffic alone.

#### 6.1.2 Engineering Feasibility

The following items will be considered in determining Engineering feasibility:

- (1) Can the barrier be designed to fit the topography and existing/designed highway barriers and still be maintained?
- (2) Can the exposed height of a noise barrier be built at 25 feet high or less?
- (3) Safety concerns:
  - A. Can the barrier be located beyond the clear recovery zone (i.e., unencumbered roadside recovery area for errant vehicles)? If the barrier must be located within the clear recovery zone, can it safely be protected? AND
  - B. Does the barrier allow for sufficient sight distance at intersections?

If any of the feasibility items 1–3 are checked NO, the site will be considered not feasible. If the site is considered not feasible, a reasonableness analysis will not be done. A detailed discussion on determining engineering feasibility is included in the *NDOT Traffic Noise Analysis Guidance Manual*.

### 6.2 Reasonableness

There are three reasonableness factors or "tests" that must be met for a noise abatement measure to be considered reasonable.

- (1) Noise reduction design goal of 7 dB(A). A minimum of 50 percent of benefited front-row receptors directly behind the noise wall must achieve a 7 dB(A) noise reduction for noise abatement to be reasonable.
- (2) Cost Effectiveness. Noise abatement must be cost effective. NDOT defines cost effectiveness as dollars per benefited receptor. Based on construction price estimates for 2021, NDOT will use a unit cost of \$52/ft<sup>2</sup> (re-evaluated every 5 years) for barrier heights up to 16 feet. The unit cost increases by 40 percent to \$73/ft<sup>2</sup> for wall heights from 16 to 25 feet to account for additional structural considerations.

The allowable cost per benefitted receptor is determined by design year noise level and the height of the adjacent barrier. NDOT allows for adjustments based on the design year noise level as shown in Tables 4-1a and 4-1b. The average noise level of all impacted receptors adjacent to a barrier is used to determine the design year noise level. In addition, if any receptor behind a proposed barrier experiences a substantial increase in build noise levels, the allowable cost per benefitted receptor would be increased by \$3,000 and would

apply to all benefitted receptors behind that specific barrier where the substantial increase is experienced. Furthermore, the allowable cost per benefitted receptor will be increased if any part of the adjacent barrier is 16-25 feet in height, and the increased cost would apply to all receptors benefitted by that specific barrier (Table 4-1b). If the cost per benefitted receptor is greater than the adjusted allowable cost shown in Table 6-1 or Table 6-2, as applicable, the abatement will be considered not reasonable.

**Table 6-1. Allowable Costs Per Benefitted Receptor (0-16 feet tall barrier)**

Design Year Noise Level*	Allowed Cost per Benefitted Receptor	Allowed Cost per Benefitted Receptor with Substantial Increase**
66-67 dB(A) or below w/substantial increase	\$41,600	\$44,600
68-69 dB(A)	\$44,600	\$47,600
70-71 dB(A)	\$47,600	\$50,600
72-73 dB(A)	\$50,600	\$53,600
74+ dB(A)	\$53,600	\$56,600

\* Average noise level for all impacted receptors adjacent to a barrier.

\*\* If any receptor behind a proposed barrier experiences a substantial increase in build noise levels, the allowable cost per benefitted receptor would be increased by \$3,000 and would apply to all benefitted receptors behind that specific barrier where the substantial increase is experienced.

**Table 6-2. Allowable Costs Per Benefitted Receptor (16 - 25 feet tall barrier)**

Design Year Noise Level*	Allowed Cost per Benefitted Receptor	Allowed Cost per Benefitted Receptor with Substantial Increase**
66-67 dB(A) or below w/substantial increase	\$58,400	\$61,400
68-69 dB(A)	\$61,400	\$64,400
70-71 dB(A)	\$64,400	\$67,400
72-73 dB(A)	\$67,400	\$70,400
74+ dB(A)	\$70,400	\$73,400

\* Average noise level for all impacted receptors adjacent to a barrier.

\*\* If any receptor behind a proposed barrier experiences a substantial increase in build noise levels, the allowable cost per benefitted receptor would be increased by \$3,000 and would apply to all benefitted receptors behind that specific barrier where the substantial increase is experienced.

The cost of utility relocation, drainage control, and right-of-way acquisition may be factored into the cost effectiveness of noise abatement with prior approval by NDOT. For instance, costs for ROW acquisition can be included in the overall barrier cost if the barrier must be placed outside the project ROW to satisfy the feasibility and reasonableness criteria. In addition, utility relocation and drainage costs can only be factored into the cost effectiveness if the conflicts are due to construction of noise abatement alone and not due to the project. If the noise abatement design can be modified to avoid the utility or drainage conflicts and still meet the feasibility criteria and the noise reduction design goal, these additional costs cannot be applied. Although using aesthetic treatments on noise

barriers is allowed, it cannot be factored into the cost effectiveness evaluation. In addition, cost averaging of noise abatement (i.e., averaging several barriers together that otherwise would not meet the cost-effectiveness criteria individually) is not allowed. In some instances, breaks or gaps in a barrier may be required to facilitate drainage or allow access to a residence, etc., and would not result in each segment of the barrier being evaluated individually. Conversely, barriers on either side of a street intersection for example would be considered individual barriers and could not be evaluated as a single barrier.

- (3) Viewpoints of the property owners and tenants of the benefited receptors (“Noise Abatement Stakeholders”). When it is determined that it would be feasible to provide noise abatement for a site, and a preliminary determination has been made that abatement would be reasonable (barrier is cost effective and meets the noise reduction design goal), a noise abatement stakeholder meeting will be held during the NEPA process for a final determination of whether abatement would be reasonable. The benefited property owners and tenants (if applicable) will be given an opportunity to vote in the form of a ballot vote. NDOT defines a benefited receptor as achieving at least a 5 dB(A) reduction. The benefited property owners and tenants will receive a ballot and information packet (map showing the project area and where the proposed noise wall is, a description of the project, and anticipated season and year for start of construction) 15 days prior to the noise abatement stakeholder meeting. A ballot template can be found in the NDOT *Traffic Noise Analysis Guidance Manual*. Ballots are due 15 days after the meeting date and can be mailed back or returned in person. If property owners or tenants have not returned a ballot by 15 days after the meeting date, a second ballot will be mailed via certified mail. If the second ballot is not returned within 15 days after it is received, the property owner or tenant will not have a vote. (NDOT will account for delivery time and non-returned ballots cannot be counted as “no” votes.) Ballots will also be available at the noise abatement stakeholder information meeting.

The noise abatement stakeholder meeting is conducted by the Environmental Section in coordination with the Public Involvement Unit and Civil Rights Coordinator. Outreach (letters and meetings) will be conducted in compliance with the most current, approved version of the *NDOT Public Involvement Procedure* (Chapter 9, *Environmental Procedure Manual*) and the *NDOT Traffic Noise Analysis Guidance Manual*. If protected populations were identified within the environmental study area as part of the NEPA process, the project proponent must be able to demonstrate due diligence to engage these populations. For local governments, coordinate with your Local Project Division Project Coordinator who will consult with a Civil Rights Coordinator for guidance on conducting public outreach in protected populations or LEP. When NDOT is conducting public outreach in protected population areas, contact will be made with the NDOT Civil Rights Coordinator for guidance.

Noise abatement will only be provided if at least 75 percent of points from returned ballots are in favor of the proposed noise barrier as a strong majority has historically worked well in Nebraska. If the benefited property owners and residents reject the construction of a noise abatement device, their area will not be reconsidered for future noise abatement unless another Type I Project is proposed for the area or if there is a re-evaluation on the current project. Specific to noise, a re-evaluation may be required for project changes such as substantial shifts in horizontal or vertical alignment, doubling/halving of the design year traffic volumes, etc. The re-evaluation process is outlined in Chapter 7 of the *Environmental Procedures Manual*.

## 6.3 Voting

Consideration of the viewpoints of all the benefited receptors shall be solicited, with weighted voting applied to owner occupied versus tenant occupied.

For both residential and commercial uses, the occupant of each benefited dwelling unit, whether owner or tenant, will receive one vote. In addition, the owner of each dwelling unit will also receive a vote. For owner occupied dwelling units, the same individual would cast both votes while a rented dwelling unit would have both the owner and the tenant casting one vote each. For multi-family dwelling units, the owner will have the same number of votes as the number of units that are benefited. For example:

Owner occupied single-family dwelling:

- Two votes cast by same individual

Tenant occupied single-family dwelling:

- One vote cast by owner/1 vote cast by tenant

Multi-family dwelling (e.g., 6-unit apartment building)

- Six votes cast by owner/1 vote cast by each of the tenants

For Category C and D uses such as parks, cemeteries, and schools, the owner of the development or the agency unit directly responsible for the property will receive the solitary vote.

## 7. NEPA

Information Required for NEPA Decision: Prior to Categorical Exclusion approval or issuance of a Finding of No Significant Impact or Record of Decision for a Type I project, NDOT must complete the following as part of the NEPA document:

- (1) Identify and document the locations where noise impacts will occur.
- (2) Identify and document the noise abatement measures that are feasible and reasonable and are likely to be incorporated into the project.
- (3) Identify and document noise impacts for which no abatement appears to be feasible and reasonable.
- (4) Include a statement of likelihood in the NEPA document to include the preliminary location and description of noise abatement measures determined to be feasible and reasonable.

For federal projects, third-party funding CANNOT be used if the noise abatement measure would require additional funding from the third party to be considered feasible and/or reasonable. Third-party funding can only be used to pay for additional features such as landscaping, aesthetic treatments or absorptive treatments for noise barriers that already meet cost-effectiveness criteria.





## 8. Information for Local Officials

To prevent future traffic noise impacts on currently undeveloped lands, NDOT shall inform local officials within whose jurisdiction the transportation facility project is located of the following:

- (1) The best estimation of future noise levels (for various distances from the highway improvement) for developed and undeveloped lands and properties in the immediate vicinity of the transportation facility.
- (2) Information that may be useful to local communities to protect future land development from becoming incompatible with anticipated highway noise levels.
- (3) Non-eligibility for federal-aid participation for Type II projects as described in §772.13(b) of this chapter.



## 9. Federal Participation

Federal funds may be used for noise abatement measures when:

- (1) Traffic noise impacts have been identified.
- (2) Abatement measures have been determined feasible and reasonable per this noise policy.



## 10. Construction Noise

The evaluation and control of construction noise must be considered as well as the traffic noise. The noise sensitive receptors that are located directly adjacent to this project are those that are of major concern in this study of construction noise. These same receptors were also of concern in the traffic noise study.

The following are some basic categories of mitigation measures for construction noise.

**Design Considerations:** This includes measures in the plans and specifications to minimize or eliminate adverse impacts.

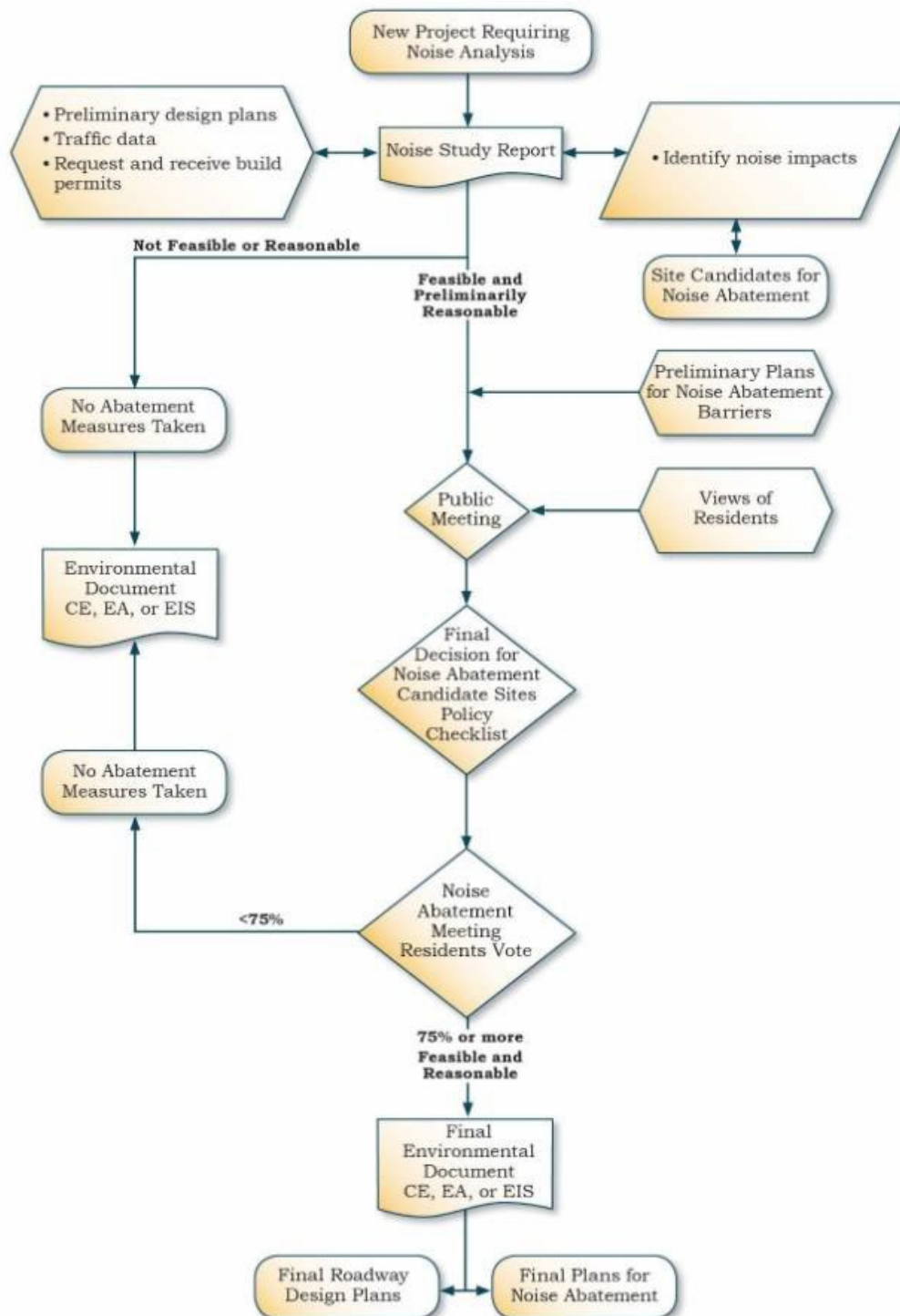
**Community Awareness:** It is important for people to be made aware of the possible inconvenience and to know its approximate duration so they can plan their activities accordingly. It is the policy of the NDOT that information concerning the upcoming project construction is submitted to all local news media.

**Source Control:** This involves reducing noise impacts from construction by controlling the noise emissions at their source. This can be accomplished by specifying proper muffler systems, either as a requirement in the plans and specifications on this project or through an established local noise ordinance requiring mufflers. Contractors generally maintain proper muffler systems on their equipment to ensure efficient operation and to minimize noise for the benefit of their own personnel as well as the adjacent receptors.

**Site Control:** Site control involves the specification of certain areas where extra precautions should be taken to minimize construction noise. One way to reduce construction noise impact at sensitive receptors is to operate stationary equipment, such as air compressors or generators, as far away from the sensitive receptors as possible. Another method might be placing a temporary noise barrier in front of the equipment. As a general rule, good coordination between the project engineer, the contractor, and the affected receptors is less confusing, less likely to increase the cost of the project, and is a more personal approach to work out ways to minimize construction noise impacts in the more noise-sensitive areas. No specific construction-noise, site-control specifications will be included in the policy.

**Time and Activity Constraints:** Limiting work hours on a construction site can be very beneficial during the hours of sleep or on Sundays and holidays. However, most construction activities do not occur at night and usually not on Sundays. Exceptions due to weather, schedule, nighttime work to benefit daytime traffic operations and a time-related phase of construction work could occur. No specific constraints will be incorporated in this policy. Enforcement of these constraints could be handled through a general city or county ordinance, either listing the exceptions or granting them on a case-by-case basis.

**Figure 10-1. Noise Analysis and Abatement Process**



## 11. References

Code of Federal Regulations. 23 CFR 772.

Nebraska Department of Transportation. 2018. *Categorical Exclusion Re-Evaluation Guidance*.

Nebraska Department of Transportation. 2018. *Traffic Noise Analysis Guidance Manual*.

Nebraska Department of Transportation. 2018. *Noise Analysis and Abatement Policy*.





Attachment:1  
Noise Abatement Criteria Table





**Noise Abatement Criteria Table**  
[Hourly A-weighted Sound Level decibels (dB(A))]

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

<sup>1</sup> The Leq(h) Activity Criteria values are for impacted determination only and are not design standards for noise abatement.

<sup>2</sup> Includes undeveloped lands permitted for this activity category.