



TRAFFIC AND CONSTRUCTION NOISE ANALYSIS AND ABATEMENT POLICY

Nevada Department of Transportation (NDOT)

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PURPOSE AND APPLICABILITY

The Policy presents the Nevada Department of Transportation's (NDOT) program to define and implement Part 772 of Title 23 of the Code of Federal Regulations ([23 CFR 772](#))¹ as published on July 13, 2010. This document addresses the applicability, NDOT specific definitions, traffic noise prediction, analysis of traffic noise impacts, analysis of noise abatement measures (including feasibility and reasonableness), construction noise, information for local officials, qualifications to perform traffic noise analysis, record keeping for noise barrier inventory, and previous policy revisions. This policy describes the NDOT's approach to implementation in areas where the Federal Highway Administration (FHWA) has given state highway agencies flexibility.

The Policy uniformly and consistently applies to all Federal and Federal-aid highway projects authorized under title 23 as outlined in 23 CFR 772.7 and the FHWA's Highway Traffic Noise: Analysis and Abatement Guidance² ([FHWA Traffic Noise Guidance](#)) revised in December 2011. This includes Federal and Federal-aid projects that are administered by Local Public Agencies (LPAs). For assistance in evaluating the applicability of the Policy, consult NDOT's Environmental Division.

As defined in 23 CFR 772, the Policy applies to all Type I³ Federal or Federal-aid projects. Type I projects involve construction of a new highway or existing highway that alters the horizontal or vertical alignment or increase the number of through traffic lanes. Type II projects are proposed Federal or Federal-aid projects for traffic noise abatement on an existing roadway where there is no improvement to the roadway itself that increases the vehicle-carrying capacity. Type II programs are voluntary and at the discretion of the state highway agency. Any Federal-aid project that does not currently fit into a Type I or Type II project, is a Type III project. FHWA regulations and guidance do not require a noise analysis or consideration of abatement measures for Type III projects. NDOT does not have a policy or program that address traffic noise for Type II or Type III projects.

Federal funds may be used for noise abatement measures for Type I projects if they meet criteria described in 23 CFR 772.15 Federal Participation and the FHWA Traffic Noise Guidance.

¹ [23 CFR Part 772 – Procedures for Abatement of Highway Traffic Noise and Construction Noise](#). Source: 75 FR 39834; July 13, 2010.

² [Highway Traffic Noise: Analysis and Abatement Guidance](#), US Department of Transportation, Federal Highway Administration, December 2011.

³ Per 23 CFR Part 772.7 this policy applies to all Type I, II, and III projects. However, NV does not participate in the Type II Program, and Type III projects do not require a noise analysis.

DEFINITIONS

Definitions are presented in 23 CFR 772.5, the FHWA Traffic Noise Guidance and include terminology used in this Policy. The CFR and FHWA Traffic Noise Guidance definitions shall be used. Additional NDOT defined terminology shall be used and includes:

Approach level: 1 dBA $Leq_{(1h)}$ less than the Noise Abatement Criteria (NAC) for Activity Categories A to E when determining a traffic noise impact. (per 772.11(e))

Benefited Receptor: The recipient location of an abatement measure that receives a noise reduction of at least 5 dBA, regardless of whether the receptor is impacted. This is used for the reasonableness calculation. Not to be confused with *impacted receptor*.

Date of Public Knowledge: The date the FHWA or NDOT approves the Categorical Exclusion (CE), or the date FHWA approves the Finding of No Significant Impact (FONSI) or the Record of Decision (ROD) as defined in 23 CFR 771. For projects delivered in multiple phases, the final design for each phase will have a noise analysis. The Date of Public Knowledge will change for each phase of a project on the date NDOT approves an environmental certification or when FHWA and NDOT approve a NEPA reevaluation or supplemental to the environmental documents.

dBA: A unit of measurement of sound level (loudness) for traffic noise, “dB” refers to decibel and “A” refers to the frequency scale. The “A-scale” is a frequency weighing system that closely represents the average human hearing response.

Design Year: The future year that is used to estimate the probable traffic volumes for which a highway is designed. This is usually 20 years out from when the project is designed.

Feasible Abatement: Abatement that has been judged to be effective at lowering noise levels and is possible to construct based on acoustical and engineering factors. For an abatement measure to be feasible, NDOT requires that 50% of front row receptors receive a minimum reduction of 5 dBA in noise levels. Engineering feasibility factors that are considered include barrier height, safety, topography, drainage, utilities, and access.

Front row receptor: A noise sensitive receptor which is located in the first row/front row adjacent to the highway right-of-way.

Impacted Receiver: In Nevada, a receiver is considered to be impacted when the future build alternative noise level is 1 dBA less than the corresponding FHWA noise abatement criteria (NAC). A receiver can also be impacted when there is

at least a rounded 12 dBA increase for the future build scenario over the existing, true noise levels (also called *Substantial Noise Increase*). Not to be confused with *benefited receptor*.

Leq: *Leq* is the decibel metric that will be used for all Department project level noises analysis. It is the equivalent, continuous sound level, in dBA, over the period of measurement. It is usually reported in a 1-hour equivalency, $Leq_{(1h)}$. (per Table 1, Footnote 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.

Noise Abatement Criteria (NAC): The Federal decibel level where the highway traffic noise can begin to qualify for abatement. The NAC is 67 dBA for Activity Categories B and C. This level is calculated as an hourly, A-weighted equivalency dBA $Leq_{(1h)}$. Values for different Activity Categories can be found in Table 1, below.

Noise Impact Criteria: NDOT assigns one decibel below the Federal criteria for each Activity Category. Federal criteria are shown in Table 1, below.

Noise Reduction Design Goal: 7 dBA $Leq_{(1h)}$. The optimum desired dBA noise reduction determined from calculating the true difference between future build noise levels with proposed abatement to future build noise levels without abatement. At least one (1) benefited receptor must achieve the noise reduction design goal of 7 dBA; but strive to get as many receptors as possible to reach this level while continuing to meet the feasible and reasonableness criteria.

Noise Sensitive Area/Receiver: Locations that are used for purposes sensitive to noise and require protection. Examples include hospitals, schools, daycare facilities, elderly housing, convalescent facilities, private residences, apartments, parks, cemeteries, libraries, places of worship, playgrounds, hotels, and motels.

Reasonable Abatement: An abatement measure that has already passed the feasibility test can move onto reasonableness. The abatement must be cost effective, able to achieve NDOT's Noise Reduction Design Goal, and not have substantial community opposition prior to its construction.

Receiver: Modeling or measurement location that represents noise sensitive land uses. It can represent multiple receptors or equivalent dwelling units.

Receptor: An activity or unit location represented by a measured or modeled receiver, also called an equivalent unit (subset of receiver).

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. This statement describes what mitigation may be at the time of the National Environmental Policy Act (NEPA) document and is not a guarantee of potential abatement.

Substantial noise increase: One of two types of highway traffic noise impacts. In Nevada, a substantial increase impact is an increase of at least a rounded 12 dBA Leq_(1h) in the design year over the existing noise level and is independent of the absolute noise level. Any predicted total noise level equal to or exceeding 11.5 dBA over true (non-rounded) value is considered a substantial noise increase (per 23 CFR 772.5, 772.11(f)).

Traffic Noise Abatement Measure (TNAM): A physical structure, typically concrete; between the roadway segment and noise sensitive receivers constructed to reduce highway traffic noise.

Table 1 Noise Abatement Criteria (NAC) [Hourly A-Weighted Sound Level decibels (dBA)]¹

| Activity Category | Activity Criteria ² | | Evaluation Location | Activity Description |
|-------------------|--------------------------------|--------|---------------------|---|
| | Leq(h) | L10(h) | | |
| A | 57 | 60 | Exterior | Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose. |
| B ³ | 67 | 70 | Exterior | Residential |
| C ³ | 67 | 70 | 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 structures, radio stations, recording studios, trails, and trail crossings. |
| D | 52 | 55 | Interior | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio stations, recording studios, schools, and television studios. |
| E ³ | 72 | 75 | Exterior | Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F. |
| F | - | - | - | Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing. |
| G | - | - | - | Undeveloped lands that are not permitted. |

¹ Either Leq(h) or L10(h) (but not both) may be used on a project.

² The Leq(h) and L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

³ Includes undeveloped lands permitted for this activity category.

TRAFFIC NOISE PREDICTION

The traffic noise prediction is described in 23 CFR 772.9 and the FHWA Traffic Noise Guidance. The FHWA Traffic Noise Model, TNM 2.5, or the most current version of TNM, will be used to predict traffic noise. If other models are found acceptable to FHWA and pursuant to 23 CFR 772.9, they may be proposed and will be evaluated on a case-by-case basis. FHWA-approved traffic noise screening tools and processes shall be used when applicable.

NDOT does not allow the use of noise contour lines for determining highway traffic noise impacts (per 23 CFR 772.9(c)).

Information on when and how to conduct traffic noise field measurements is described in 23 CFR 772.11 and the FHWA Traffic Noise Guidance (per 23 CFR 772.11).

Average pavement type must be used in noise prediction (per 23 CFR 772.9(b)).

To calculate worst noise hour, the highest peak traffic volume for a given hour is multiplied by the posted speed limit (per 23 CFR 772.9 (d)).

All calculations within TNM are rounded to the tenths place (0.X). These values are rounded to the nearest whole number within the final reporting for clarity. A model is considered validated if the field reading is +/- 3 dBA from TNM.

ANALYSIS OF TRAFFIC NOISE IMPACTS

The traffic noise impact analysis is described in 23 CFR 772.11 and the FHWA Traffic Noise Guidance. NDOT has established the “approach level” to be 1 dBA less than the NAC for Activity Categories A to E when determining a traffic noise impact. NDOT has defined the “substantial noise increase” to be 12 dBA Leq_(1h) over existing noise levels. The “substantial noise increase” is independent of the absolute noise level. The noise analysis will determine all traffic noise impacts from the project. See Table 1 (above) for applicable criteria (per 23 CFR 772.11(b)).

Receptor locations for highway traffic noise analysis shall typically be at ground level, or first floor; and, at an exterior area of frequent human use (EAFHU), between the right-of-way line and building (e.g., patios, balconies, decks, pools, playgrounds). Impacted receptors shall be identified or grouped by unique identification numbers. Activity Category B, multi-family dwelling units, shall be analyzed by identifying EAFHU and ascertaining the number of dwelling units. For Activity Category B, if there is not an EAFHU, there is no noise impact.

NDOT shall evaluate eligible Activity Categories C and D areas by utilizing the “equivalent number of residences” method (per 23 CFR 772.11 (c)(2)(iii), (iv), and (v)).

This will be done for all Type I projects throughout the State. This shall be completed in the manner of the example below taken from the FHWA Traffic Noise Guidance.

This approach involves identifying the representative lot size of residential development and dividing the land area of portion of the park that is within the study area by the area of the representative lot size. For example, the typical lot size in a community is 60'x120' or 7,200 square feet (SF). Noise modeling predicts noise impacts from the project to a distance of 350 feet. A park in the community is adjacent to the project and has 1000' of frontage. The total impacted area of the park is 350,000 (SF). Dividing this by the typical lot size of 7,200 SF for an equivalent number of receivers results in 48.6. Therefore, the park is representative of 49 receivers.

Activity Category E shall be analyzed in the manner applied to Activity Category B, multi-family residences.

In addition, Activity Categories C, D, & E shall be evaluated considering a use factor, as available. This will examine the actual amount of time used including seasonal use at the noise sensitive area (NSA). Determining subsequent traffic noise impacts and any resulting TNAM shall be weighted accordingly.

The adjusted use factor values will be used at the location of the activity (e.g., playground, ball field). If there is no specific location, the average lot size will be used. For a park in the example above, 49 receivers would be used initially. Using the average lot size (60'x120'), the park would have a maximum of 17 first row receivers, 17 second row receivers, and 15 third row receivers. If the park is only open for twelve (12) hours a day will have its use factor adjusted down to one-half time. The final use values for the park would be 9 first row, 9 second row, and 8 third row receivers.

For example, an outdoor water park with noise sensitive areas which is only open six months of the year, for twelve (12) hours a day will have its use factor adjusted down to one-quarter time. This value would then be multiplied to each NSA found in the initial analysis.

ANALYSIS OF NOISE ABATEMENT MEASURES

Analysis of traffic noise abatement is described in 23 CFR 772.13 and the FHWA Traffic Noise Guidance. NDOT will primarily consider noise barriers, typically concrete, for traffic noise abatement. NDOT will utilize cost averaging as allowed in 23 CFR 772.13(k). NDOT does not participate in the FHWA Quieter Pavement Program, and pavement type cannot be considered in analysis nor used as a TNAM (per 23 CFR 772.13(c)(1)).

Absorptive treatments as a functional enhancement for noise abatement measures will not be considered.

For Activity Category C & D, if there are no EAFHU, the analysis should follow the interior noise abatement criteria using Table 2 (below) (per 23 CFR 772.11(c)(2)(iv)).

FHWA publication, FHWA_HEP-18-065 – Noise Measurement Handbook (<https://www.fhwa.dot.gov/environment/noise/measurement/handbook.cfm#toc492990784>) – section 6.0, provides procedures to measure building noise reductions for type I highway project noise studies.

Table 2: Building Noise Reduction Factors

| Building Type | Window Condition | Noise Reduction Due to Exterior of the Structure |
|---------------|------------------------|--|
| All | Open | 10 dB |
| Light Frame | Ordinary Sash (closed) | 20 dB |
| | Storm Windows | 25 dB |
| Masonry | Single Glazed | 25 dB |
| | Double Glazed | 35 dB |

*The windows shall be considered open unless there is firm knowledge that the windows are in fact kept closed almost every day of the year.

Per FHWA guidance, the results in Table 2 are conservative and represent typical outdoor-indoor noise reduction (OINR) for the listed factors. The actual OINR can be calculated using method from ISO 12354-3:2017⁴ if wall construction, façade surface area, percent of façade surface area for windows and doors, window opening area, roof and ceiling construction, window construction, etc. are known.

FEASIBILITY

The feasibility of traffic noise abatement is described in 23 CFR 772.13(d)(1) and the FHWA Traffic Noise Guidance. NDOT considers a TNAM that achieves at least a 5 dBA reduction for 50% of the first, or front, row of impacted receptors as acoustically feasible. According to FHWA, most people recognize a perceptible sound difference with a 5 dBA change. This is the minimum requirement and does not preclude achieving the higher noise reduction design goal set in the reasonableness section below. The noise reduction design goal shall be achieved, to the maximum number of benefited receptors, if criteria can be satisfied (per 23 CFR 772.13(d)(1)(i)).

Engineering feasibility affecting the final design and placement of sound barriers may be controlled by numerous factors including, but not limited to topography, barrier height, access requirements, existing roadways, utilities, drainage, maintenance, other noise sources, safety considerations, or other project specific factors. Engineering feasibility will be evaluated according to the current edition of the American Association of State Highway Transportation Officials (AASHTO) publication “A Policy on Geometric Design

⁴ ISO 12354-3:2017, “Building acoustics - Estimation of acoustic performance of buildings from the performance of elements - Part 3: Airborne sound insulation against outdoor sound.”

of Highways and Streets”, (a.k.a. AASHTO Green Book). Sound barrier design requirements are also addressed in project contract documents and per the NDOT Structure Division’s *Structures Manual*, 2008 at <https://www.dot.nv.gov/doing-business/about-ndot/ndot-divisions/engineering/structures/structures-manual> or contact the NDOT Structural Design Division at 1-775-888-7540 (per 772.13(d)(1)(ii)).

REASONABLENESS

If a noise barrier is determined feasible based on the above feasibility criteria, an assessment for reasonableness is required for the barrier. Reasonableness is described in 23 CFR 772.13(d)(2) and the FHWA Traffic Noise Guidance. Three criteria are used to evaluate the reasonableness of eligible mitigation under consideration: (1) the Noise Reduction Design Goal (NRDG), (2) the cost effectiveness of the TNAM, and (3) points-of-view of the benefited property owners and residents.

FHWA regulations and guidance require the highway agency to define and receive approval for the NRDG of at least 7 dB(A) but not more than 10 dB(A), for a defined number of benefited receptors. NDOT defines the NRDG to be at least one (1) benefited receptor at 7 dBA (per 23 CFR 772.5, 772.13(d)(2)(iii)) as reasonable. This is a minimum goal, and this goal will be achieved for as many receivers as possible. However, not achieving a higher target goal will not invalidate the process, nor the improved abatement results. The greatest noise reduction possible shall be given to the maximum number of receivers possible while staying within reasonableness cost criteria (per 23 CFR 772.13(d)(2)(ii)).

NDOT may use optional reasonableness criteria, where necessary on projects to provide additional benefit to receivers. These factors can include date of development, length of time receivers have been exposed to highway traffic noise impacts, exposure to higher absolute highway traffic noise levels, changes between existing and future build conditions, percentage of mixed-use zoning development, and use of noise compatible planning concepts by the local government. No single optional reasonableness factor can be used to determine reasonableness (per 23 CFR 772.13(2)(v), 23 CFR 772.17(b)). NDOT will update local governments, staff, and elected officials, as appropriate, through the department's public involvement process. Local officials shall be invited to all traffic noise-related meetings, public information meetings, and public hearings.

A cost-benefit analysis will be prepared to evaluate the TNAM. A maximum construction cost of \$56,000 (2022 U.S. dollars [USD]) is allotted per benefited receptor (e.g., dwelling, equivalent unit) that satisfies Policy criteria. This allowance will be evaluated at least every five years (per 23 CFR 772.13(d)(2)(ii)).

Proposed noise barrier type shall meet prescribed specifications of reducing traffic noise. Precast concrete barriers (e.g., post and panel) are the most used TNAM. To satisfy the cost effectiveness, \$40 per square foot (SF) (2022 USD) is used in the cost reasonable calculation. The cost effectiveness is evaluated only on factors to construct

(e.g., materials and labor). It does not require considering other costs, such as engineering/design, right-of-way, drainage, or utility relocation. Deviations from this will be evaluated on a case-by-case situation as allowed per regulation, guidance, policy, and practice. The cost-to-construct value will be reevaluated at least every five years.

The TNAM (e.g., noise barriers) will be constructed as modeled and designed unless enough benefited receptors are opposed to their construction, as described below. The viewpoints of the benefited receptors will be solicited and incorporated into the NEPA document noise discussion.

For each phase, outreach will be done to determine if benefited receptors are opposed to their construction. The proposed TNAM will be constructed as refined during project final design or the latest NEPA re-evaluation. Only benefited receptors can request or participate in altering a proposed TNAM. Benefited receptors of one TNAM cannot participate in altering other proposed TNAMs from which they do not receive a qualifying benefit.

For an alteration to, or removal of, a proposed barrier to be considered, responses from benefited receptors shall be submitted in writing or documented in the public record during a public hearing and/or meeting. The respondent's status with the property should be clearly identified and their standing validated to allow participation. In the case of rental properties, views of both the owner and the legal resident(s) will be considered in the decision-making process. However, if opposing views over the TNAM develop between the property owner of a benefited property and its legal occupant(s), the preference of the property owner will take precedence.

To alter a proposed TNAM, two criteria must be met. First, to initiate reconsideration of the proposed TNAM, a qualifying response from a majority (50%, plus one [+1]) of all the valid identified benefited receptors of that TNAM must be received prior to the date of public knowledge.

On meeting the first criteria, second criteria will be evaluated using ballots sent via U.S. certified mail to benefited receptors for that TNAM. It will request their vote on retaining or removing the proposed TNAM. A TNAM must retain all other criteria necessary to allow it to be funded. If a ballot is not received from a benefited receptor after 30 calendar days from mailing, a second ballot will be sent under the same conditions. If the U.S. Postal Service could not deliver a ballot and it is returned, it will be noted in the administrative record and further attempts will not be made.

The following scoring system will be used for returned, valid ballots and the tallied results must support any change to the proposed TNAM. The area of the removed TNAM will not be eligible for future consideration of a TNAM. If a valid change is enacted and the proposed TNAM is altered, the final voting results will be sent to all the identified benefited receptors for that TNAM.

The preferences of benefited receptors will be evaluated and tallied as follows per returned ballot:

- Those receiving a 7+ dBA reduction or greater in projected traffic noise levels shall receive three points.
- Those receiving a 6 dBA reduction in projected traffic noise levels shall receive two points.
- Those receiving a 5 dBA reduction in projected traffic noise levels shall receive one point.
- Those receiving less than a 5 dBA reduction in projected traffic noise levels are not a benefited receptor and shall not participate.

As provided in 23 CFR 772.13(k) on Type I projects, FHWA delegates to the highway agency (NDOT) the option to cost average traffic noise abatement among benefited receptors within common noise environments. NDOT allows the cost averaging option.

In evaluating for reasonableness, NDOT strives to implement the above criteria consistently while achieving the optimal benefit for our residents and communities (per 23 CFR 772.13(d)(2)(i)).

THIRD PARTY FUNDING

Per FHWA guidance, third-party funding is acceptable on a Federal or Federal-aid highway Type I project to make functional enhancements, such as absorptive treatment and access doors or aesthetic enhancements, to a noise abatement measure already determined feasible and reasonable. However, NDOT does not allow third-party funding for traffic noise abatement within State rights-of-way to make unreasonable abatement become cost reasonable (per 23 CFR 772.13(j)).

CONSTRUCTION NOISE

Construction noise is described in 23 CFR 772.19. Procedures to minimize construction noise impacts, while considering traffic impacts, will be addressed on a project-by-project basis. These procedures may include use of the FHWA Roadway Construction Noise Model (RCNM) for construction noise analysis (per 23 CFR 772.19(b)). When reasonable and feasible, project TNAM will be constructed as early in the project as possible to provide mitigation from construction noise.

All rules and regulations for project-specific work shall be followed in the project specifications and the *NDOT Standard Specifications for Road and Bridge Construction (Silver Book)*,

<https://www.dot.nv.gov/home/showpublisheddocument/6916/636257041112930000>.

DOCUMENTATION

Prior to adoption of a Categorical Exclusion (CE), Finding of No Significant Impacts (FONSI), or Record of Decision (ROD) from the NEPA process, NDOT shall produce a Statement of Likelihood. This is a statement within the official project documentation stating which traffic noise abatement measures are feasible and reasonable, and which are likely to be incorporated into the project and noise impacts for which no noise abatement measures are feasible and reasonable (per 772.13(g)(3)).

INFORMATION FOR LOCAL OFFICIALS

Information for local officials is described in 23 CFR 772.17 and the FHWA Traffic Noise Guidance. Local officials will be informed of potential traffic noise impacts to noise sensitive land adjacent to a proposed highway project to protect land development from becoming incompatible with traffic noise levels. Information that will be submitted to local agencies include representative receiver locations taken on each of the vacant parcels to show the existing sound level. This information is collected during the NEPA process, as well as subsequent reevaluations, and available within the project documentation and on NDOT's website for each specific project (per 23 CFR 772.17(a)).

Traffic noise abatement for development adjacent to the highway occurring after the date of public knowledge is the responsibility of local municipalities. Provision for such noise abatement becomes the responsibility of local communities and private developers. After the date of public knowledge, NDOT will be available for analyzing changes in traffic noise impacts, when appropriate and deemed necessary. Information will be sent directly to local officials to inform them about future noise impacts on undeveloped lands.

RECORD KEEPING FOR NOISE BARRIER INVENTORY

One of the ongoing responsibilities of NDOT qualified personnel is to maintain an inventory of constructed traffic noise abatement. Abatement will be added to the inventory after the construction as-builts are available for each completed project (per 23 CFR 772.13(f)).

QUALIFICATIONS TO PERFORM TRAFFIC NOISE ANALYSIS

Only personnel qualified in the field of highway traffic noise analysis shall be responsible for the highway traffic noise analysis on NDOT's transportation improvement projects. Qualified personnel are those who have successfully completed training in highway traffic noise analysis and the use of the FHWA approved traffic noise modeling software, through a qualified provider, and are proficient in the use of the latest version of that software. If junior personnel don't have this experience, they must be working under more senior personnel who have all required experience.

Personnel shall have demonstrated experience in conducting traffic noise analyses for transportation improvement projects and must have exhibited a working knowledge of the procedures and policies outlined in:

- The Federal regulation (23 CFR 772) and its accompanying noise guidance material developed by FHWA (current version),
- The NDOT Traffic and Construction Noise Analysis and Abatement Policy (current version), and
- Noise Measurement Handbook and associated Field Guide
 - <https://www.fhwa.dot.gov/environment/noise/measurement/>

The qualified individual must also have successfully completed, been involved in the development and/or instruction, or demonstrate equivalent experience for the following:

- Highway traffic noise analysis training provided by FHWA and/or the National Highway Institute (NHI), and
- Training on the most currently approved FHWA noise analysis computer model(s).

Refresher and additional training may be necessary because of advanced highway traffic noise modeling technology or changes in highway traffic noise policy and/or procedure. A copy of the certificate of training and documentation of equivalent experience shall be included in their employer's prequalification packet.

POLICY REVISIONS

The Policy was originally issued April 18, 2011 and approved for use beginning July 13, 2011. It has been revised on:

- August 1, 2012 incorporating qualifications necessary to perform traffic noise analysis by amendment.
- September 26, 2012 revision removed appendices containing 23 CFR 772 and the FHWA Noise Guidance and replaced with a weblink.
- June 1, 2016 revision allowed cost averaging.
- March 1, 2017 revision incorporated qualifications to perform noise analysis into document body.
- December 1, 2017 revision included 2017(adjustable) values to determine cost reasonableness.
- August 31, 2021 revision was submitted to FHWA for consideration included 2021 adjustable cost reasonableness, and NDOT received initial comments from FHWA on November 1, 2021.

The current revised Policy, submitted to FHWA for consideration on October 13, 2022, shall be effective upon FHWA's approval and applies to traffic noise studies initiated after the effective revision date. It may also apply to studies not yet completed before the effective revision date and will be evaluated for applicability, satisfying criteria, and

enhancements to proposed TNAM. Revisions included reformatting sections of the document, updating cost values, and adding clarifying language.