Chapter 13
TRAFFIC & CONSTRUCTION NOISE

13.0 CHAPTER NOTES

This chapter was last updated December 2023.

Documents referenced in **"quotations and bold type, highlighted in green"** are other NDOT reference documents, including templates for memos, meter setup, and Traffic Noise Model (TNM) defaults.

Contents

13.1 TRAFFIC NOISE BACKGROUND & SCIENCE OF SOUND

Noise, usually defined as unwanted sound, is measured in terms of decibels. A decibel is a unit of measurement that quantifies sound pressure differences in the air that we perceive as sound (or noise) on a scale ranging from zero decibels on up. A zero-decibel measurement is the lowest threshold of human hearing, whereas values of 120 decibels will cause discomfort and pain.

The A-weighted decibel (dBA) scale is used to more closely match the frequencies that the human ear can hear. This scale is logarithmic, not linear. It is a way to display numerical data over a wide range of values in a compact way. An example of this is to add sounds together, say of two vehicles, with each vehicle being 60 dBA. The answer to the equation 60 dBA + 60 dBA = 63 dBA. Doubling the traffic volume or reducing the distance between the sound source (vehicles) and the receiver (home) will increase the sound level by 3 dBA. Conversely, reducing traffic by half or doubling the distance between the sound source and receiver will decrease the sound by 3 dBA.

Noise levels near roadways depend on six variables:

1. traffic volumes,
2. traffic speed,
3. number of heavy trucks (as a percentage of total traffic),
4. distance from the roadway,
5. intervening topography, and
6. atmospheric conditions.

Studies have shown that changes in sound levels of 3 dBA or less are not normally perceptible to the average human ear. An increase of 5 dBA is generally readily noticeable by anyone, and an increase of 10 dBA is perceived as “twice as loud” as before. Studies have also determined that traffic noise is not usually a dominate sound for residences who are at least 500 feet away from the roadway.

For highway traffic noise studies, noise levels are quantified in terms of the equivalent sound level (Leq). Leq is the averaged noise level over time, usually one hour, written as $Leq_{(h)}$. This weighted value helps to normalize the value of noise between potential peaks (i.e., when a group of motorcycles drives by) and valleys (i.e., no traffic at all, just ambient noise).

13.2 TRAFFIC NOISE ANALYSIS - OVERVIEW

In the development of any Nevada Department of Transportation (NDOT) project, or one that requires approval by the Federal Highway Administration (FHWA), a highway traffic noise analysis may be necessary. As applicable, the analysis is conducted according to current regulation, FHWA guidance documents, and NDOT policy.

13.2.1 REGULATIONS, GUIDANCE, AND POLICY

- 23 CFR 772 - Procedures for Abatement of Highway Traffic Noise and Construction Noise (current edition)
- FHWA Analysis and Abatement Guidance (current edition)
- Noise Measurement Handbook – Final Report FHWA-HEP-18-065 (dated 6/1/2018)
- Noise Measurement Field Guide – Final Report FHWA-HEP-18-066 (dated 6/1/2018)
- NDOT Traffic and Construction Noise Analysis and Abatement Policy (updated 10/20/2022)
- FHWA Traffic Noise Model and Tools

Figure 1. Table 1 of FHWA Noise Abatement Criteria

This table goes into the different Activity Categories that are assigned for each noise sensitive area (NSA) and their Noise Abatement Criteria (NAC).

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.

13.3 MINIMUM REQUIREMENTS TO CONDUCT NOISE WORK – INTERNAL & EXTERNAL

All personnel who assist with noise work must have minimum training prior to working on NDOT projects. Those certifications are required to be part of each packet submittal and submitted prior to the commencement of work by consultants.

Field staff and those compiling data need to have successfully completed at least the FHWA-NHI-142088 How to Measure Highway Traffic Noise class. The remainder of classes in that series are helpful and suggested, but not required.

Staff working on FHWA TNM modeling, validation, and review must also have documentation of successfully completing a TNM training course.

Additional resume information on projects worked and the tasks involved are encouraged for all noise staff.

13.4 HOW TO CONDUCT PROJECT TRAFFIC NOISE REVIEW - EXTERNAL

All projects with geometric changes, including capacity improvements, should have a traffic noise analysis done with a resulting memo to file or a full-scale traffic noise report. These projects are defined as Type I projects in 23 CFR 772.5 (outlined below).

> *(1) The construction of a highway on new location; or,*
>
> *(2) The physical alteration of an existing highway where there is either:*
>
> > *(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,*
> >
> > *(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,*
>
> *(3) The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or,*
>
> *(4) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,*
>
> *(5) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,*
>
> *(6) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,*
>
> *(7) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.*
>
> *(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.*

A capacity improvement is ANY widening that will increase the number of through-traffic lanes. Exemptions can be made for auxiliary, acceleration/deceleration, and turn lanes less than one-half mile (2,640 feet) with proper documentation. Early communication and complete documentation with NDOT Environmental Traffic Noise staff is essential for this decision.

Capacity improvements that don't increase the existing roadway prism, such as shrinking lane widths and shoulders to add a lane, or having driving allowed on shoulders are considered Type I projects. Most auxiliary, truck climbing, passing, HOV, and general-purpose lanes will need a full-scale analysis, regardless of location within the state.

A traffic noise technical report is required for all projects where an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is prepared. Some Categorical Exclusion (CE) projects will also need a technical report depending on the traffic noise impact. Consult with NDOT Environmental Traffic Noise staff at project initiation to determine the type of traffic noise analysis that will be required.

Per existing regulation, a Type I improvement on ANY part of the project, makes the ENTIRE project length a Type I project for traffic noise analysis purposes.

13.4.1 INITIAL DOCUMENTATION NEEDS FOR PROJECT TRAFFIC NOISE REVIEW

All minimum data inputs are necessary PRIOR to the start of any model building, validation, modeling, and analysis. Delay in obtaining minimum input data will postpone the turnaround time of the report. Minimum inputs required for analysis include:

- Existing and future traffic volumes and vehicle fleet mix (for both no-build and build future years).
    - These values MUST be preapproved by NDOT Traffic Operations prior to use.
        - They are generally provided by those conducting the traffic analysis (consultant or otherwise).
    - Methodology documentation on vehicle percentages to use for each model and run needs to be approved prior to beginning model creation.
        - What fleet mix will be use on each section of the project?
        - Will motorcycle and bus volumes be independently included in the model or added to the medium and heavy truck counts?
        - Will the fleet mix remain constant throughout the project length?
        - Will the fleet mix remain constant between the existing and future conditions?
- Existing mapping and surfaces out at least 500 feet from right-of-way (R/W), including buffer along ends of all roadways.
- Design plan and striping files and all existing and new roadway surfaces.

In addition, the following is STRONGLY SUGGESTED:

- From these inputs, files and a master spreadsheet should be created. The master spreadsheet should have tabs (individual sheets) for: Receivers, Validation, Walls (existing soundwalls), Existing Privacy Walls, Terrain Lines, Buildings Modeled as Barriers, Buildings Modeled as Building Rows, Existing Road Segments (includes barrier rail), Build Road Segments (includes barrier rail), Existing Traffic, No-Build Traffic, Build Traffic, New Proposed Wall Locations, and Traffic Percentage. A sample project spreadsheet can be provided by request. If a consultant team chooses to not follow the NDOT spreadsheet, please provide the same information in an open-source data format along with each submittal as well as all CAD files used (current version Microstation V8i, ss2).

13.4.2 OVERVIEW OF STEPS FOR PREPARING ANALYSIS

There are seven main steps in this process:

1. Find out the complete scope and total length of the project.

2. Discuss methodology with NDOT and gain documented approval (i.e., if shoulders will be modeled, barrier rail modeled, vehicle types).

3. Learn if any noise sensitive areas (NSAs) exist within 500 feet of R/W.
    a. Sample sources: aerial mapping, assessor land use data

4. Discover permit status and land use of all parcels adjacent to the project area. This land use data will determine the Activity Category of the parcel. NSAs are in Activity Categories A, B, C, D, and E. See Table 1 of 23 CFR 772 for details.
    a. Depending on project location, this task can be challenging. For instance, the Washoe County Assessor GIS has a permitting function built in, whereas for Esmeralda County, you'll have to call the assessor and provide as much parcel information you have —the more, the better.
        i. You'll need the Assessor's Parcel Number (APN) for each adjacent parcel.

5. Find out existing and future traffic volume and percentage by vehicle type. Include memo or other documentation in report appendices.
    a. If traffic data is coming from NDOT:
        i. NDOT Traffic Operations will provide this in its approved traffic memo.
            1. The memo will include existing and future traffic volumes along each segment of the project (potentially in both AM and PM peak volumes) and fleet mix.
    b. b. If traffic data is coming from outside NDOT:
        i. all data will be approved by NDOT Traffic Operations prior to use.

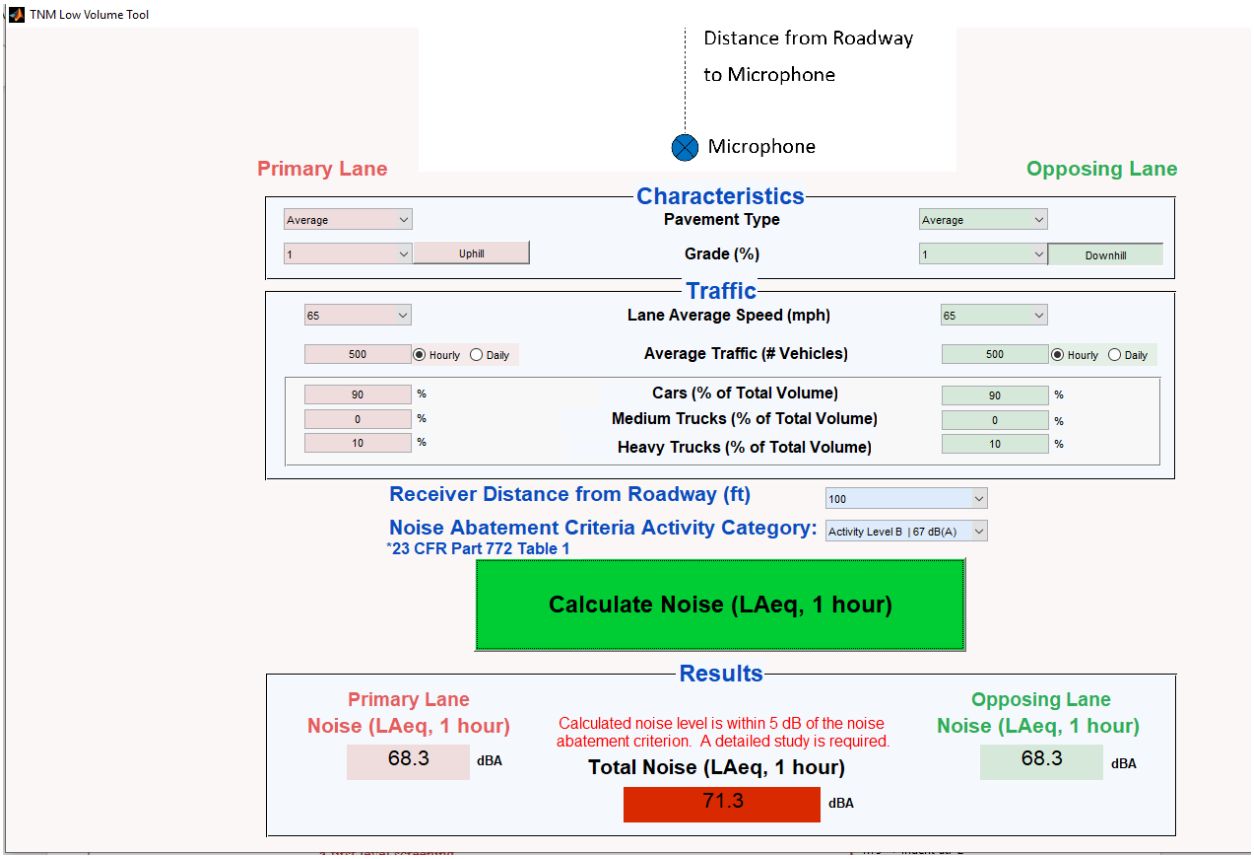
6. Determine type of analysis necessary for the project.

    a. If there are no NSAs, no valid NSA permits, nor no NSA land use, document as such in the traffic noise memo. Then documentation is complete.
        i. If there is no NSA, then there cannot be a noise impact.
    b. If there are NSAs, valid NSA permits, or NSA land use conduct modeling, the type of modeling will depend on traffic volumes, NSA quantity, and type of NSAs, along with project location.
        i. Less intensive modeling should be conducted using the FHWA Traffic Noise Screening Tool (see Figure 2) if the project is on a lower volume road.
            1. This is a basic FHWA-approved screening tool. It should be used as a first level screening. If basic results are within 5 dBA of NAC, then TNM modeling shall be done.
        ii. For more robust TNM screening, TNM 2.5 is used. (See NDOT's **"Intro to TNM Defaults"** document for more information on TNM modeling for NDOT projects.)
            1. Additional data is needed to create this modeling, including:
                a. Centerline data for each existing and future travel lane,
                b. Existing and future barrier rails,

c. Concrete masonry walls 6 feet or taller (neighborhood/privacy walls),
d. Terrain line information in areas of great topographic change,
e. Number of dwelling units in each NSA, and
f. Location of each NSA.

7. Ensure documentation has the following sections:
    a. Introduction
        i. Scope and location of the project
        ii. Why the project is a Type I
        iii. Project identification numbers, including for the electronic Statewide Transportation Improvement Plan (eSTIP)
    b. Proposed Action and Alternatives
        i. Existing Conditions
            1. Existing land use
            2. Surrounding NSAs
            3. Active permits
        ii. Build Alternative
        iii. No-Build Alternative
    c. Regulatory Criteria
    d. Methodology
        i. Fundamentals of traffic noise
        ii. Criteria for increases in noise levels
        iii. Noise sensitive land uses
        iv. Assumptions and limitations
    e. Impact Assessment
        i. Traffic noise validation – measured noise levels and model
        ii. Existing noise levels
        iii. Predicted noise levels (design year)
    f. Traffic Noise Abatement Measures
        i. Existing traffic noise barriers and privacy walls
        ii. Barrier analysis – feasibility and reasonableness
        iii. Results of noise barrier analysis
        iv. Noise impact contour analysis
    g. Information for Local Officials
    h. Construction Noise
    i. Conclusions and Recommendations
    j. References
    k. Tables
    l. Figures
    m. Appendices
        i. Noise Map
        ii. Results of Traffic Noise Analysis
        iii. Field Validation Sheets and Measurements
        iv. Traffic Data
        v. FHWA Noise/TNM certifications

Figure 2. Image from FHWA Traffic Noise Screening Tool



13.5 HOW TO CONDUCT PROJECT TRAFFIC NOISE REVIEW – INTERNAL

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> *(4) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,*
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> *(5) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,*
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> *(6) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,*
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> *(7) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.*
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> *(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.*

A capacity improvement is ANY widening that will increase the number of through-traffic lanes. Exemptions can be made for auxiliary, acceleration/deceleration, and turn lanes less than one-half mile (2,640 feet) with proper documentation. Early communication and complete documentation with NDOT Environmental Traffic Noise staff is essential for this decision.

Capacity improvements that don't increase the existing roadway prism, such as shrinking lane widths and shoulders to add a lane, or having driving allowed on shoulders are considered Type I projects. Most auxiliary, truck climbing, passing, HOV, and general-purpose lanes will need a full-scale analysis, regardless of location within the state.

A traffic noise technical report is required for all projects where an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is prepared. Some Categorical Exclusion (CE) projects may need a technical report prepared instead of a memo to file. Consult with NDOT Environmental Services Manager.

Per existing guidance, a Type I improvement on ANY part of the project, makes the ENTIRE project length a Type I project for traffic noise analysis purposes.

Projects that don't qualify as a Type I project for traffic noise can be noted as such in an email to the designated project environmental lead and put into the project eFile to serve as documentation.

13.5.1 INITIAL DOCUMENTATION NEEDS FOR PROJECT TRAFFIC NOISE REVIEW

All minimum data inputs are necessary PRIOR to the start of any model building, validation, modeling, and analysis. Delay in obtaining minimum input data will postpone the turnaround time of the report. Minimum inputs required for analysis include:

- Existing and future traffic volumes and vehicle fleet mix (for both no-build and build future years).
    - These values MUST be preapproved by NDOT Traffic Operations prior to use.
        - They are generally provided by those conducting the traffic analysis (consultant or otherwise).
    - Methodology documentation on vehicle percentages to use for each model and run needs to be approved prior to beginning model creation.
        - What fleet mix will be use on each section of the project?
        - Will motorcycle and bus volumes be independently included in the model or added to the medium and heavy truck counts?
        - Will the fleet mix remain constant throughout the project length?
        - Will the fleet mix remain constant between the existing and future conditions?
- Existing mapping and surfaces out at least 500 feet from right-of-way (R/W), including buffer along ends of all roadways.
- Design plan and striping files and all existing and new roadway surfaces.

From these inputs, files and a master spreadsheet should be created. The master spreadsheet should have tabs (individual sheets) for: Receivers, Validation, Walls (existing soundwalls), Existing Privacy Walls, Terrain Lines, Buildings Modeled as Barriers, Buildings Modeled as Building Rows, Existing Road Segments (includes barrier rail), Build Road Segments (includes barrier rail), Existing Traffic, No-Build Traffic, Build Traffic, New Proposed Wall Locations, and Traffic Percentage.

13.5.2 OVERVIEW OF STEPS FOR PREPARING ANALYSIS

There are six main steps in this process:

1. Find out the complete scope and total length of the project.
    a. That information should be on programming papers, Masterworks, eSTIP, and plans. Confirm scope with the project manager. ALL locations should have the

same data. If not, updates must be completed by the project manager and eSTIP group before documentation can be finished.

b. Gather screenshots from documentation (at least the correct eSTIP and Masterworks) and put them into the document's last section, "References."
    i. Information to cross-reference includes Project ID, PIN (7XXXX, 6XXXX), STIP number, project scope, and location.

2. Learn if any NSAs are within 500 feet of R/W.
    a. Sample sources: aerial mapping, assessor land use data

3. Discover permit status and land use of all parcels adjacent to the project area. This land use data will determine the Activity Category of the parcel. NSAs are in Activity Categories A, B, C, D, and E. See Table 1 of 23 CFR 772 for details.
    a. Depending on project location, this task can be challenging. For instance, the Washoe County Assessor GIS has a permitting function built in, whereas for Esmeralda County, you'll have to call the assessor and provide as much parcel information you have —the more, the better.
        i. You'll need the APN for each adjacent parcel. Coordinate with R/W Survey Services and Roadway Design to gather this information.

4. Find out existing and future traffic volume and percentage by vehicle type.
    a. Roadway Design ***should*** provide all this information. If not, ideally all information should be pulled from NDOT Traffic Operations approved traffic memo. For non-standard projects without a full traffic report, follow steps below.
        i. If not, percentage vehicle type can be found using the most current year vehicle classification report put out by NDOT Traffic Information
        ii. Contact the NDOT Traffic Information group for vehicle size and weight classification data, as well as speed and fleet mix.
    b. Existing traffic volumes (up to the previous year) can be pulled from NDOT Traffic Information System (TRINA).
    c. Trends for future need (growth rate) must come from NDOT Traffic Information.

5. Determine type of analysis necessary for the project.
    a. If there are no NSAs, no valid NSA permits, nor no NSA land use, document as such in the traffic noise memo to file (**"Sample no NSA memo example"**). Then documentation is complete.
        i. If there is no NSA, then there cannot be a noise impact.
    b. If there are NSAs, valid NSA permits, or NSA land use conduct modeling, the type of modeling will depend on traffic volumes, NSA quantity, and type of NSAs, along with project location.
        i. Less intensive modeling should be conducted using the FHWA Traffic Noise Screening Tool (see Figure 2).
            1. This is a basic FHWA-approved screening tool. It should be used as a first level screening. If basic results are within 5 dBA of NAC, then TNM modeling should be done.
        ii. For more robust TNM screening, TNM 2.5 is used. (See NDOT's **"Intro to TNM Defaults"** document for more information on TNM modeling for NDOT projects.)

            1. Additional data is needed to create this modeling, including:
                a. Centerline data for each existing and future travel lane (tip:

collect from Microstation),
   b. Existing and future barrier rails and existing soundwalls (tip: collect from Microstation),
   c. Concrete masonry walls (neighborhood/privacy walls) 6 feet or taller (tip: collect from Microstation),
   d. Terrain line information in areas of great topographic change,
   e. Number of dwelling units in each NSA, and
   f. Location of each NSA.

6. Ensure documentation has the following sections:
   a. Introduction
      i. Scope and location of the project
      ii. Why the project is a Type I
      iii. Project identification numbers, including for the electronic Statewide Transportation Improvement Plan (eSTIP)
   b. Proposed Action and Alternatives
      i. Existing Conditions
         1. Existing land use
         2. Surrounding NSAs
         3. Active permits
      ii. Build Alternative
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   c. Regulatory Criteria
   d. Methodology
      i. Fundamentals of traffic noise
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   i. Conclusions and Recommendations
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   k. Tables
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   m. Appendices
      i. Noise Map
      ii. Results of Traffic Noise Analysis
      iii. Field Validation Sheets and Measurements

iv. Traffic Data
v. FHWA Noise/TNM certifications

13.6 CONSTRUCTION NOISE

Noise related to construction activities on an NDOT project will be evaluated per applicable regulations, guidance, and policy on a project-by-project basis and addressed in the project's plan and special provisions, as needed. Specification 637.03.03 Night Work Noise Abatement shall be added to all contracts conducting construction activities between 8 p.m. and 6 a.m. with nearby NSAs.

13.7 PROCEDURE FOR RESPONDING TO TRAFFIC NOISE COMPLAINTS/INQUIRIES - INTERNAL

1. Listen to and document the entire complaint/inquiry.

(*TIP: Try contacting the inquirer by phone first if possible. Use a calming voice and just listen. Only ask clarifying questions about the issue. Don't invalidate any of the person's feelings. Document the conversation by summarizing it.*)

If the complaint doesn't come directly to you, gather as much contact information as possible and contact the person back as soon as possible to acknowledge the issue and that it is on your radar. This will let the person know that the process is moving along. Many citizens who inquire are impressed that we not only respond to them but do so in a quick, informed manner.

Sometimes they are upset about packs of motorcycles going by or drivers with loud stereos. There is nothing we, as NDOT, can do about either of those instances. However, we can, and should, acknowledge their concerns.

Other times, they want to know more information about construction activity near them. If that is the case, you can gather their information and see if the project has a webpage that is maintained by the resident engineer (RE) or project manager (PM) to share with them.

2. Identify the location of the complaint/inquiry (physical address, including zip code) and verify that the person making the inquiry is the property owner.

(*TIP: Find assessor data of ownership by going to the county assessor website. You can use your favorite search engine to type in key terms (i.e., Elko County Assessor*)).

Once you're on the website, look for "real property" and use the property address to find individual parcel information. Make sure to fill in all applicable fields in the Noise Complaints Master spreadsheet: \\DATSRV1\013 Engineering\013 Noise\Complaints_and_Requested_Measurements\NOISE COMPLAINTS_MASTER.xlsx.

3. Ask yourself: Is the complaint/inquiry from the property owner?

If no, inform the person that we can only provide full information with the property owner. Sometimes this is another person in the household. If that's the case, we just need the legal owner's buy-in on the inquiry/complaint. This can happen by the owner being cc'd on an email and agreeing. It doesn't need to be more official than that. If it is a renter who is complaining/inquiring, then ask the renter to reach out to the landlord/property owner to buy-in on the complaint.

If yes, move to STEP 4.

4. Determine whether the offending roadway is under NDOT jurisdiction.

(*TIP: This can be found by using the State Maintained Highways of Nevada, Descriptions and Map published by Roadways Systems. Another option is using the Road Ownership & Maintenance tool.)*

If no, provide the inquirer with contact information for the correct agency. (*TIP: You will need to verify you are giving the person the correct agency information. Just because the surrounding streets are in one jurisdiction, doesn't mean the affected street is, too. For instance, Sun Valley is in Washoe County but is surrounded by areas that are under City of Reno jurisdiction.*)

If yes, move to STEP 5.

NOTE: For all inquiries, even if they end up not being under NDOT jurisdiction, a paper record should be created. At minimum, a project folder named after the property address should be created and kept in the master Complaints and Requested Measurements folder. Screenshots of the assessor's information and a map of the general area should be kept in the project file. These are often labeled as "GoogleAssessorInfo_StreetAddress." Ideally, a second document called "Citizen Contacts" should be created. In that document have all contacts with the resident summarized. If primary contact is by email or ZenDesk, create a folder for the complaint within the email folder for documentation. If the complaint is being directed elsewhere, note that in the document. This will be the final notation on file.

5. If roadway noise is coming from a road under FHWA or NDOT authority, evaluate the reason and activity that may be causing the complaint. As part of this activity, the traffic noise analyst will investigate activities near the complaint and whether NDOT construction activities are taking place and traffic noise abatement measures for the location were provided as part of a previous NDOT project.

a. Find previous environmental documents for corresponding projects in the area or inquiry. These can be current or historical projects. (*TIP: To find previous documents, use IRWIN ApplicationXtender, IRWIN As-Builts, or Roadway Design's Contract Search to narrow down the contract by project location.*)

b. Ask yourself: Do the homes predate the roadway? (*TIP: Tools like IRWIN As-Builts, environmental documents, and historical aerial mapping may be of use.*)

i. If no, determine/research why the home did not previously qualify for a traffic noise abatement measure (TNAM). Find the necessary documentation. Maybe the home was not projected to be over NAC in the most recent environmental document?

ii. If yes, no proposed mitigation can be provided unless a new Type I project comes through area. (The home was built after the last roadway geometric change). This becomes a land use planning issue by the local jurisdiction allowing noise-sensitive receptors near the roadway.

1. The local jurisdiction could have required mitigation (like a concrete privacy wall around development) as part of its permitting process. This privacy wall may have brought the development under NAC. If so, provide the resident with the best contact information you have for the local jurisdiction for follow up.

6. Draft a letter to the property owner with findings addressing the inquiry, using supporting information found in your research.

(*TIP: You can use a recent, nearby inquiry reply letter as a template. The format of the letter is standardized for the most part.*)

The letter and accompanying documentation should include assessor information, Google aerial, sound chart, as well as an overview of information found during research on why a soundwall was/wasn't proposed, the status of upcoming projects, etc. Additional information that may be included: TRINA information (traffic volumes over the past 10 years) and upcoming project information in eSTIP.

The letter should be reviewed and edited in-house prior to being sent.

The first page of the final letter should be on NDOT letterhead.

7. Once the letter is approved internally, send it and documentation to the property owner through the Postal Service. Also, send it through email if the person has provided that as a way of contact.

8. File correspondence and all documentation into project master files: Complaints and Requested Measurements.

9. Send a copy of the complete packet through email to all other NDOT personnel who may have been part of the inquiry (i.e., through ZenDesk, Infobox, Project Manager, Design Team, RE: on construction project) so everyone is aware that the traffic noise portion of the complaint has been handled.

13.8 PROCEDURE FOR RESPONDING TO TRAFFIC NOISE COMPLAINTS/INQUIRIES WITH 24-HOUR COURTESY READING (RARE CASES) - INTERNAL

NOTE: The only difference between this section and 13.7 is that two additional steps are added (6 & 7) in this option, which involves the actual collection of data.

1. Listen to and document the entire complaint/inquiry.

(*TIP: Try contacting the inquirer by phone first if possible. Use a calming voice and just listen. Only ask clarifying questions about the issue. Don't invalidate any of the person's feelings. Document the conversation by summarizing it.*)

If the complaint doesn't come directly to you, gather as much contact information as possible and contact the person back as soon as possible to acknowledge the issue and that it is on your radar. This will let the person know that the process is moving along. Many citizens who inquire are impressed that we not only respond to them but do so in a quick, informed manner.

Sometimes they are upset about packs of motorcycles going by or drivers with loud stereos. There is nothing we, as NDOT, can do about either of those instances. However, we can, and should, acknowledge their concerns.

Other times, they want to know more information about construction activity near them. If that is the case, you can gather their information and see if the project has a webpage that is maintained by the resident engineer (RE) or project manager (PM) to share with them.

2. Identify the location of the complaint/inquiry (physical address, including zip code) and verify that the person making the inquiry is the property owner.

(*TIP: Find assessor data of ownership by going to the county assessor website. You can use your favorite search engine to type in key terms (i.e., Elko County Assessor*)).

Once you're on the website, look for "real property" and use the property address to find individual parcel information. Make sure to fill in all applicable fields in the Noise Complaints Master spreadsheet: \\DATSRV1\013 Engineering\013 Noise\Complaints_and_Requested_Measurements\NOISE COMPLAINTS_MASTER.xlsx.

3. Ask yourself: Is the complaint/inquiry from the property owner?

If no, inform the person that we can only provide full information with the property owner. Sometimes this is another person in the household. If that's the case, we just need the legal owner's buy-in on the inquiry/complaint. This can happen by the owner being cc'd on an email and agreeing. It doesn't need to be more official than that. If it is a renter

who is complaining/inquiring, then ask the renter to reach out to the landlord/property owner to buy-in on the complaint.

If yes, move to STEP 4.

4. Determine whether the offending roadway is under NDOT jurisdiction.

(*TIP: This can be found by using the State Maintained Highways of Nevada, Descriptions and Map published by Roadways Systems. Another option is using the Road Ownership & Maintenance tool.)*

If no, provide the inquirer with contact information for the correct agency. (*TIP: You will need to verify you are giving the person the correct agency information. Just because the surrounding streets are in one jurisdiction, doesn't mean the affected street is, too. For instance, Sun Valley is in Washoe County but is surrounded by areas that are under City of Reno jurisdiction.*)

If yes, move to STEP 5.

NOTE: For all inquiries, even if they end up not being under NDOT jurisdiction, a paper record should be created. At minimum, a project folder named after the property address should be created and kept in the master Complaints and Requested Measurements folder. Screenshots of the assessor's information and a map of the general area should be kept in the project file. These are often labeled as "GoogleAssessorInfo_StreetAddress." Ideally, a second document called "Citizen Contacts" should be created. In that document have all contacts with the resident summarized. If primary contact is by email or ZenDesk, create a folder for the complaint within the email folder for documentation. If the complaint is being directed elsewhere, note that in the document. This will be the final notation on file.

5. If roadway noise is coming from a road under FHWA or NDOT authority, evaluate the reason and activity that may be causing the complaint. As part of this activity, the traffic noise analyst will investigate activities near the complaint and whether NDOT construction activities are taking place and traffic noise abatement measures for the location were provided as part of a previous NDOT project.

a. Find previous environmental documents for corresponding projects in the area or inquiry. These can be current or historical projects. (*TIP: To find previous documents, use IRWIN ApplicationXtender, IRWIN As-Builts, or Roadway Design's Contract Search to narrow down the contract by project location.*)

b. Ask yourself: Do the homes predate the roadway? (*TIP: Tools like IRWIN As-Builts, environmental documents, and historical aerial mapping may be of use.*)

i. If no, determine/research why the home did not previously qualify for a traffic noise abatement measure (TNAM). Find the necessary documentation. Maybe the home was not projected to be over NAC in the most recent environmental document?

ii. If yes, no proposed mitigation can be provided unless a new Type I project comes through area. (The home was built after the last roadway geometric change). This becomes a land use planning issue by the local jurisdiction allowing noise-sensitive receptors near the roadway.

1. The local jurisdiction could have required mitigation (like a concrete privacy wall around development) as part of its permitting process. This privacy wall may have brought the development under NAC. If so, provide the resident with the best contact information you have for the local jurisdiction for follow up.

6. Contact the property owner to find a time convenient to the State to conduct a reading.

Readings outside of District 2 may be delayed until additional field wok or meetings necessitate travel to outlying parts of the state.

a. Let the owner know what the reading will consist of:

1. Measures of all sound, not just traffic noise. The meter needs to be away from noise sources (human, animal, mechanical, etc.).

2. The meter needs to be set up in an Exterior Area of Frequent Human Use (EAFHU) and in a secure location. This would be between the offending roadway and the residential property.

3. The owner will need to sign an entry permit prior to any equipment being set up.

4. The reading will need to occur under optimal noise conditions: dry pavement and winds projected 12 mph or below.

7. Start a 24-hour courtesy reading.

A reading will capture the average sound level. Each value recorded will be the average of each second. NOTE: just because a motorcycle drove by, and the meter spiked to 98 dBA for a second doesn't mean the owner qualifies for a soundwall.

See **"NDOT How to Conduct a Noise Measurement"** document for complete details on conducting a reading. Meanwhile, the **"Meter Setup"** document references the applicable settings for NDOT meters.

8. Draft a letter to the property owner with findings addressing the inquiry, using supporting information found in your research.

(*TIP: You can use a recent, nearby inquiry reply letter as a template. The format of the letter is standardized for the most part.*)

The letter and accompanying documentation should include assessor information, Google aerial, sound chart, as well as an overview of information found during research on why a soundwall was/wasn't proposed, the status of upcoming projects, etc. Additional information that may be included: TRINA information (traffic volumes over the past 10 years) and upcoming project information in eSTIP.

The letter should be reviewed and edited in-house prior to being sent.

The first page of the final letter should be on NDOT letterhead.

9. Once the letter is approved internally, send it and documentation to the property owner through the Postal Service. Also, send it through email if the person has provided that as a way of contact.

10. File correspondence and all documentation into project master files: Complaints and Requested Measurements.

11. Send a copy of the complete packet through email to all other NDOT personnel who may have been part of the inquiry (i.e., through ZenDesk, Infobox, Project Manager, Design Team, RE: on construction project) so everyone is aware that the traffic noise portion of the complaint has been handled.