



**NORTH CAROLINA**  
Department of Transportation



# Traffic Noise Policy

Missy Pair, PE and Tracy Roberts, AICP

June 13, 2018

# Introduction

- Key Items Divisions Should Know About Traffic Noise
- Streamlining Efforts and Process Improvements Underway
- When does a project need a noise study?
- Type I v. Type III Projects
- State v. Federal Funding
- Noise Study Process
- Timeline for TNR completion and project schedule
- TNAQ is Here to Help
- Noise Wall Placement Principles
- Date of Public Knowledge
- Traffic Noise FAQs
- Noise Wall Aesthetics (time permitting)
- Public Involvement and Balloting (time permitting)



# Key Items Divisions Should Know about Traffic Noise

- Noise Studies serve two main purposes:
  - To ID impacts for disclosure to public in compliance with NEPA/SEPA
  - To identify abatement in compliance with Federal regulation and NCDOT policy
- Two main deliverables:
  - Traffic Noise Report -- for disclosure of impacts and identification of *likely* abatement (that is, preliminarily feasible and reasonable) for NEPA/SEPA
  - Design Noise Report – to identify *recommended* abatement for inclusion in final design plans



# Key Items Divisions Should Know about Traffic Noise

- Noise Studies serve two main purposes
  - To ID impacts for design
  - To ID impacts for design

**This has implications on a Frequently Asked Question:**

**Q: If there are a bunch of driveways and intersections that would prevent a noise wall from being built, then there's no need to do a noise study, right?**

**A: Wrong. Even if no abatement can be provided due to driveways, etc., we still must identify and disclose traffic noise impacts to the public as part of National or State Environmental Policy Acts (NEPA or SEPA).**

**Final Noise Report – to identify recommended abatement for inclusion in final design plans**

# Key Items Divisions Should Know about Traffic Noise



State projects need noise studies too (more on this later)

State MCDC Projects do not require noise studies – but you may want to do one anyway.

Noise ANALYSIS on a state project and a Federal project is the same, but ABATEMENT is not. On certain types of state projects, the Division Engineer gets to make a practicability call on walls found to be feasible and reasonable (more on this later)

# Key Items Divisions Should Know about Traffic Noise

- State projects

**This has implications on a couple of Frequently Asked Questions:**

**Q: On State funded projects, does the Division Engineer get to decide if a noise study is done?**

A: No. Whether a noise study is required is dictated by policy. Consult TNAQ at scoping; we will assess your project in light of the Traffic Noise Policy and advise whether or not a noise study is needed. The new authority granted to DEs in the 2016 Traffic Noise Policy pertains to abatement, not to whether or not a study is done.

**Q: On State funded projects, when does the Division Engineer get to determine whether noise walls will be built?**

A: On a state-funded project that is not adding through lanes to an interstate or US route with full control of access, the Division Engineer can determine whether a likely noise wall identified in the TNR is practicable. The rationale for the practicability call must be provided in writing (the TNAQ Group can assist with this). This is a new provision of the 2016 Traffic Noise Policy.

and to be feasible  
(more on this later)



# Key Items Divisions Should Know about Traffic Noise

Involve Traffic Noise and Air Quality in scoping.

Send us your start of study letters, invite us to your scoping meetings, let us review your scopes of work, and let us prepare and negotiate your fees for traffic noise work.

We will steer you well and save you headaches and delays down the road.

TNAQ has to sign and accept all TNRs and DNRs, so involving us early is critical.



# Streamlining efforts and process improvements are underway

DB Process (implemented): Eliminates a DOT-prepared DNR for Design-Build projects.

LOS C Look-up Tables (to be implemented in 2018): Will provide Firms a tool in determining traffic volumes to use for traffic noise analysis.

Programmatic Agreement (to be implemented in 2018): Will provide a screening tool to exempt certain projects from needing noise studies based on ADT and other factors.

Standard TNR template being developed.



# When does a project need a noise study?

## For Federal Projects:

- Type I Projects DO require noise studies
- Type III Projects DO NOT require noise studies.

## For State Projects:

- Projects with Type I activity where a document other than an MCDC is being prepared DO require noise studies\*
- MCDC projects DO NOT require noise studies

*\*To comply with SEPA*

# Type I v. Type III Projects

## Type I Projects (Noise Study)

- Alterations to the road that may increase noise
- New through lanes including HOV, HOT, restriping existing pavement for new lanes, truck climbing lanes/passing lanes
- New auxiliary lanes that don't end in a turn lane\*

**NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
TRAFFIC NOISE POLICY**



Effective Date: October 6, 2016

# Type I v. Type III Projects

## Type I Projects (Cont.)

- Substantial change to the horizontal or vertical alignment
- Substantially altered or new rest areas, park and ride/share facilities, or toll plazas

**If any part of the project is Type I, the entire project as defined in the environmental document is Type I.**

**NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
TRAFFIC NOISE POLICY**



Effective Date: October 6, 2016

# Type I v. Type III Projects

## Type III

- In general are exempt from noise analysis and include:
  - Maintenance activities
  - Shoulder improvements
  - Intersection improvements that do not include substantial realignments
  - Some interchange modifications
  - Guardrail replacement
  - Bridge replacement on the same alignment
  - KEY: The project activity determines the need for the noise analysis; not the class of environmental document
  - Be mindful of scope creep!

# Federal v. State Funding

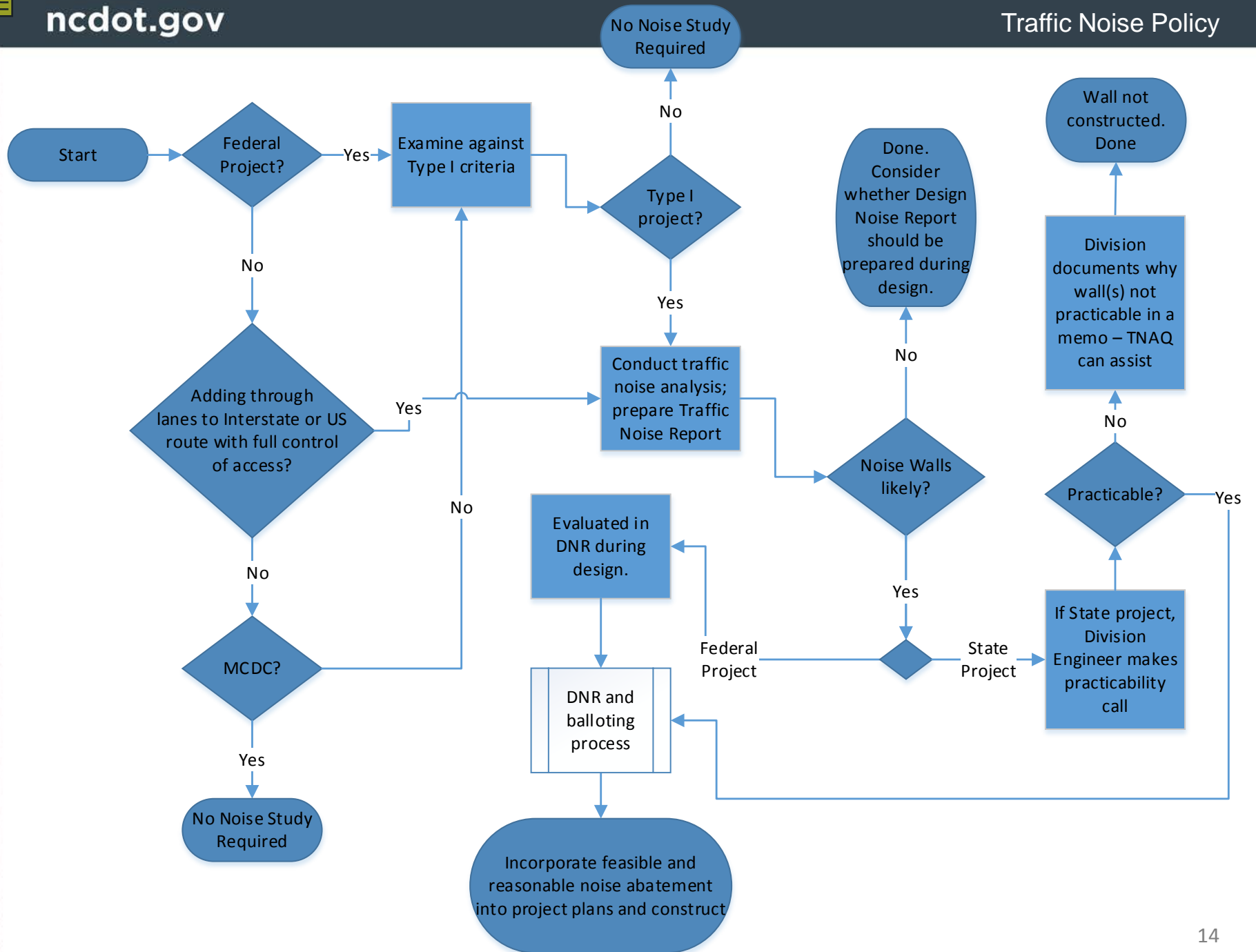
## State Funds Only

- Type I activity for:
  - US or Interstate Route, *and*
  - full control of access, *and*
  - adding a new through-lane
- All other Type I projects with a state EA or EIS
  - Analysis required
  - Division Engineer determines if abatement is practicable



Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

- State Minimum Criteria projects do not require a noise study unless first bullet above applies



# Noise Study Process

- TNR during NEPA/SEPA Phase
  - Identifies impacts
  - Where there are impacts, considers abatement
  - Identifies “likely” walls – that is walls that preliminarily meet feasibility and reasonableness criteria
- If there are likely walls identified in the TNR, the TNAQ Group will attend public meeting to answer traffic noise questions



# Noise Study Process

- If likely walls were identified in TNR, then DNR done during design phase
  - By NCDOT if Design Bid Build
  - By Design-Build Team if DB
- DNR identifies “recommended” abatement
  - That is, abatement that meets feasibility and reasonableness criteria -- except for public preference -- based on final design
  - Public preference is then solicited for the recommended walls
    - “Balloting Process”
    - TNAQ carries out
  - Recommended walls that pass the balloting process are constructed





# Timeline for TNR and Project Schedule

Allow a minimum of 150 days from NTP and availability of designs\*, whichever is later

90 days for draft TNR\*\*

30 days for review by TNAQ

30 days for revisions/approval



*\*Does not have to be preliminary plans; functional design is fine – whatever you are using to quantify other impacts for your document.*



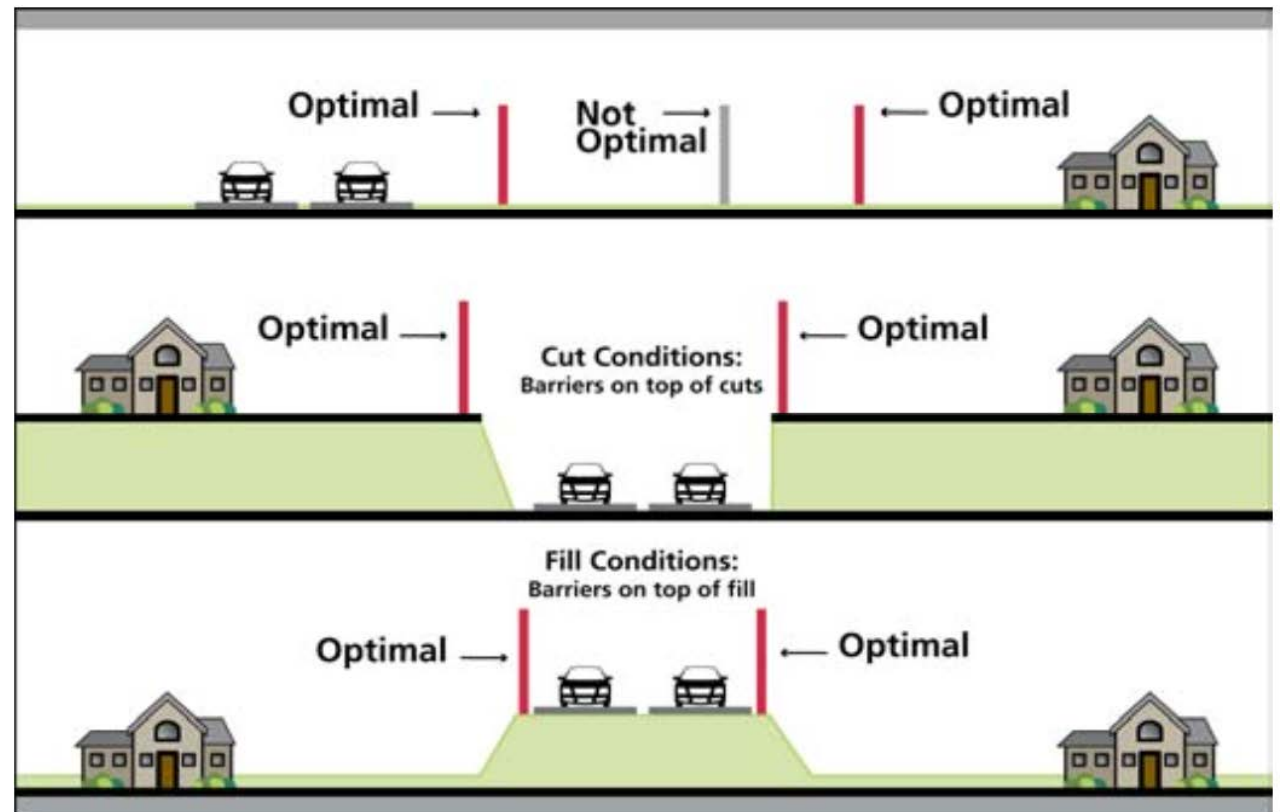
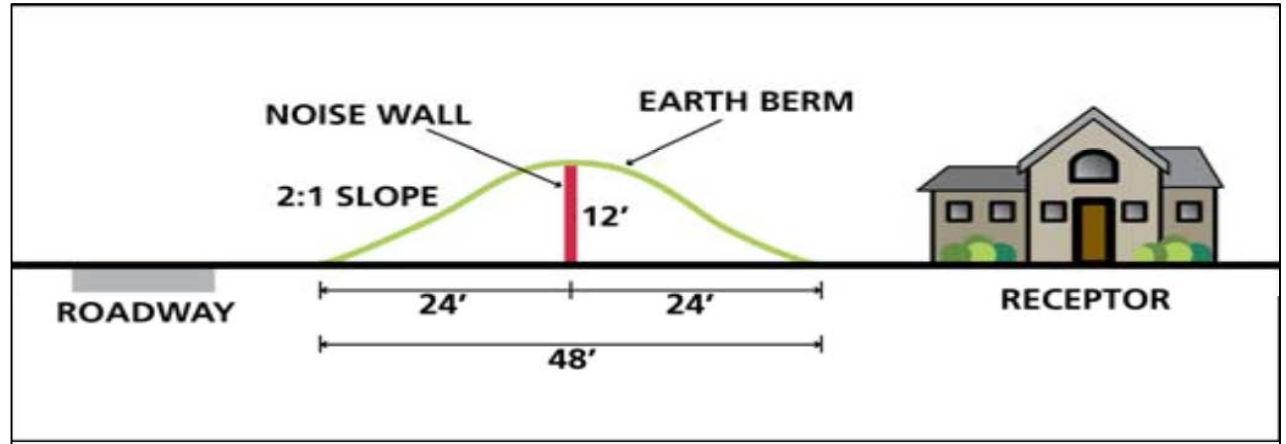
*\*\*If schedule is tight, we can advise of ways to save time.*

# TNAQ is Here to Help

## The Traffic Noise & Air Quality Group is available to:

- Assist in determining whether a noise study is needed; if in doubt, please ask; always consult us at scoping
- Review scopes of work
- Prepare in-house estimates
- Negotiate estimates with private firms
- Review/approve traffic noise work plans and model validation files
- Conduct QA/QC of Traffic Noise Reports (TNRs) and Design Noise Reports (DNRs)
- TNAQ must accept and sign all TNRs and DNRs
- If we scoped and approved the TNR and DNR, we will answer citizen questions/handle citizen complaints.

# Noise Wall Placement Principles



# Date of Public Knowledge

The date of approval of the final environmental document:

- Categorical Exclusion (CE)
- Finding of No Significant Impact (FONSI)
- Record of Decision (ROD).

Use 2011 manual/policy for projects with Date of Public Knowledge (DoPK) prior to October 6, 2016

Must determine impacts for lands permitted prior to DoPK



# Traffic Noise FAQs



- **When does a project need a noise study?**
  - If any environmental document other than a State Minimum Criteria Determination Checklist (MCDC) is being prepared, the need for a noise study is determined by the type of improvements, regardless of project funding. In these cases, always consult the Traffic Noise and Air Quality Group (TNAQ) for a determination on whether or not a noise study is needed. The policy can be a little hard to interpret, but TNAQ understands the policy's intent and applies the policy uniformly and consistently statewide in making this determination. TNAQ is always eager to help you answer this question.
  - If project is being processed as an MCDC, then no noise study is needed. However, the Division may choose to do one anyway if noise might be a public concern of the public, so that their questions can be better addressed. This is especially true if the project is building a new-location road near noise sensitive land uses (homes, churches, schools, etc.).

# Traffic Noise FAQs

**On State funded projects, when does the Division Engineer get to determine whether a noise study will be prepared?**

- The Division Engineer does not make this decision (except in the case of an MCDC). Whether or not a noise study is required is dictated by policy. Consult TNAQ office at scoping, and we will assess your project in light of the Traffic Noise Policy and advise whether or not a noise study is needed. The new authority granted to DEs in the 2016 Traffic Noise Policy pertains to abatement, not analysis.

**On State funded projects, when does the Division Engineer get to determine whether noise walls will be provided?**

- On a state-funded project that is not adding through lanes to an interstate or US route with full control of access, the Division Engineer can determine whether a likely noise wall identified in the TNR is practicable. The rationale for the practicability call must be provided in writing (the TNAQ Group can assist with this). This is a new provision of the 2016 Traffic Noise Policy.



# Traffic Noise FAQs

**If there are a bunch of driveways and intersections that would prevent a noise wall from being built, then there's no need to do a noise study, right?**

- Wrong. Even if no abatement can be provided due to driveways, etc., we still must identify and disclose traffic noise impacts to the public as part of National or State Environmental Policy Acts (NEPA or SEPA).
  - Our noise studies serve two purposes. One is to identify anticipated noise impacts and disclose them to the public in compliance with NEPA/SEPA. This is the primary purpose of the Traffic Noise Report (TNR) done during the NEPA/SEPA phase. The TNR will also identify preliminarily feasible and reasonable noise abatement.
  - The second purpose noise studies serve (achieved by the Design Noise Report [DNR]) is to identify and recommend the location and size of noise walls during final design. The results of this report are used for soliciting public preference of those benefited by a wall (the balloting process) and for providing the design team critical noise wall information for inclusion in the project plans and specifications.



# Traffic Noise FAQs



## How long does it take to do a noise study?

- Allow at least 150 calendar days from Notice to Proceed or availability of designs, whichever is later, and a completed report.

## When is the right time to get started on a noise study?

- As soon as designs are available for the detailed study alternatives. These can be functional or preliminary. It is much better to get started sooner with a lesser level of design than to wait for the availability of approved design plans. Since CEs are being done in 12 months, and since the TNR needs to be signed before the CE approval date, we need to get started as soon as any level of design on project alternatives is available.
- However, there is preliminary work (noise analysis work plan, field work, model validation, baseline modeling) that can be done while designs are being developed. This preliminary work can begin once project limits and proposed improvements are known.
- Your noise study should evaluate all detailed study alternatives, not just the Preferred Alternative, so do not wait until you select the Preferred before starting your noise study. Doing so will jeopardize your project schedule.
- Contact TNAQ for project-specific guidance as needed.



# Traffic Noise FAQs



- **What level of involvement should the TNAQ have in Division managed projects?**
  - **PROJECT SCOPING:** Always consult us at scoping and we will advise you on the need for a traffic noise (or air quality) study based on the specific project. Invite us to your scoping meetings, send us your start of study letters, send us your scopes of work to review.
  - **FIRM CONTRACT SCOPING:** We will provide a standard scope template, review your traffic noise (or air quality) scope of work, prepare workday estimates, review firm's workday estimate, negotiate with the firm when necessary.
  - **REVIEW AND APPROVAL OF DELIVERABLES:** We will review and approve all traffic noise deliverables (traffic noise work plans, validation models, TNRs, and DNRs, and TNR or DNR addenda).
  - **PUBLIC MEETINGS:** We will attend public meetings for projects where noise is a concern or where noise walls are likely. After completion of a DNR, we will also take the lead in scheduling/leading balloting meetings.
  - **BALLOTING PROCESS:** We will conduct the balloting process for soliciting public preference on recommended noise walls in a DNR.
  - **PANEL DRAWINGS:** We will review and approve all panel drawings for noise walls.
  - **DESIGN REVISION REVIEW:** We will review all design revisions to noise walls, or revisions to project design that may affect noise walls.

# Noise Wall Aesthetics

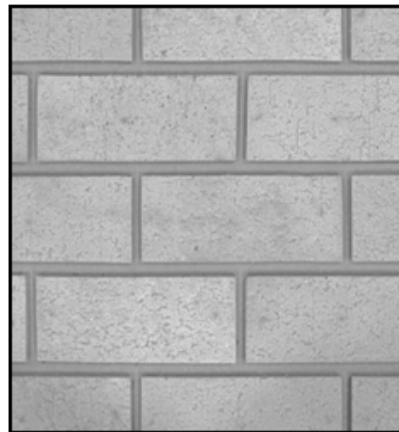
**Texture Options:**



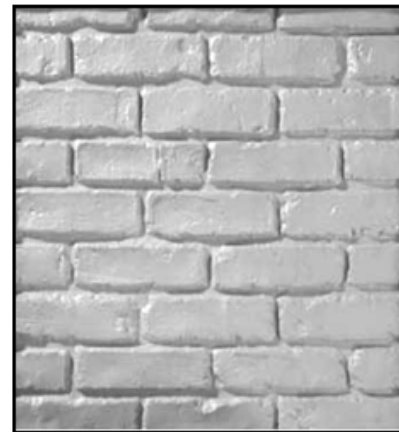
**1. Ashlar Stone**



**2. Dry Stack Stone**



**3. Standard Brick**



**4. Old Brick**

**Other Options Available**



# Noise Wall Aesthetics

## Stain Options: Federal Standard 595 Paint Colors

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 30032 | 30040 | 30045 | 30049 | 30051 |
| 30055 | 30059 | 30061 | 30062 | 30070 |
| 30075 | 30076 | 30080 | 30091 | 30095 |
| 30097 | 30099 | 30100 | 30108 | 30109 |
| 30111 | 30116 | 30117 | 30118 | 30122 |
| 30129 | 30140 | 30145 | 30152 | 30160 |
| 30166 | 30206 | 30215 | 30219 | 30227 |
| 30213 | 30252 | 30257 | 30260 | 30266 |
| 30277 | 30279 | 30313 | 30315 | 30318 |
| 30324 | 30371 | 30372 | 30400 | 30450 |
| 30475 |       |       |       |       |

Brown Palette

<http://www.colorserver.net/showpalette.asp?group=0&cmd=append%20-%20search>

|       |       |       |       |       |
|-------|-------|-------|-------|-------|
| 36008 | 36044 | 36075 | 36081 | 36089 |
| 36105 | 36109 | 36125 | 36135 | 36138 |
| 36145 | 36159 | 36165 | 36172 | 36179 |
| 36187 | 36231 | 36250 | 36251 | 36270 |
| 36280 | 36290 | 36300 | 36305 | 36307 |
| 36314 | 36320 | 36328 | 36350 | 36367 |
| 36369 | 36373 | 36375 | 36376 | 36400 |
| 36405 | 36408 | 36415 | 36424 | 36440 |
| 36463 | 36473 | 36492 | 36493 | 36495 |
| 36496 | 36515 | 36521 | 36555 | 36559 |
| 36586 | 36595 | 36622 | 36628 | 36642 |

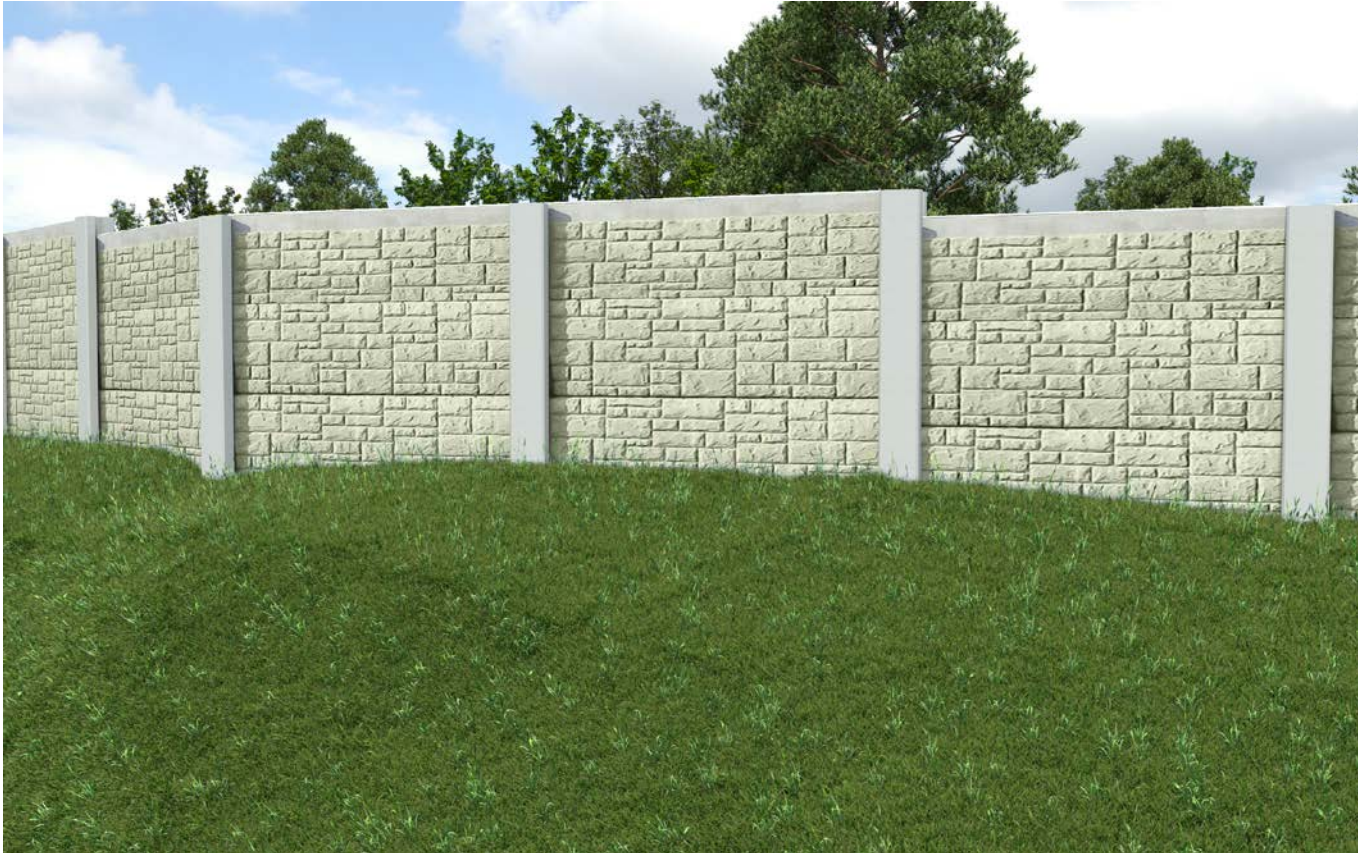
Gray Palette

<http://www.colorserver.net/showpalette.asp?group=6>

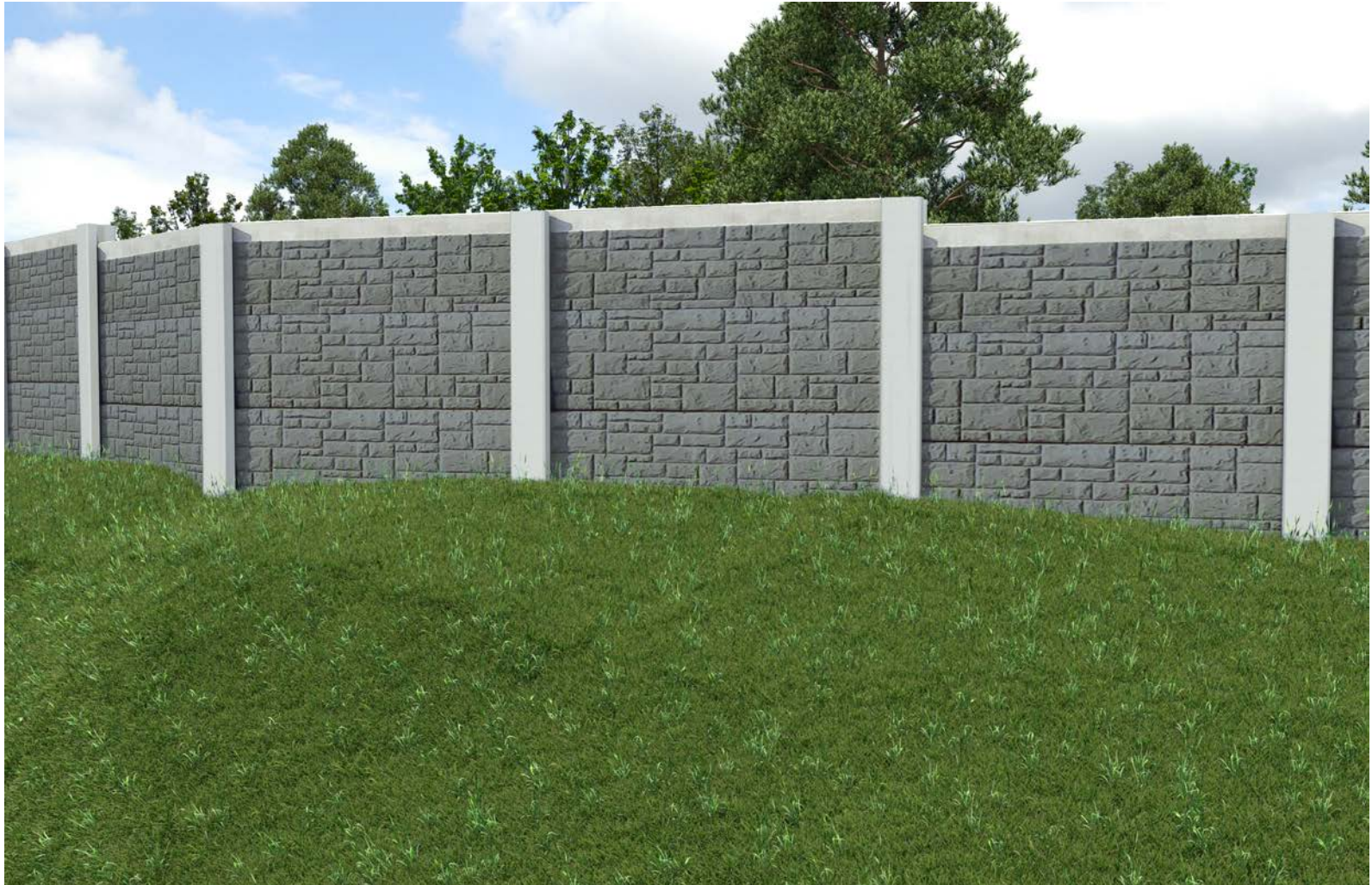


# Noise Wall Aesthetics

**Division Engineer Determines Texture and Stain Color**



Ashlar Stone with FS 36559 Stain, depicted in this visualization, is being used throughout Division 7.



Ashlar Stone with FS 36270 Stain, depicted in this visualization, is being used in Divisions 6 and 9.

# Public Involvement

## Stakeholder/project scoping

- Nature of highway traffic noise
- Types and effects of noise abatement measures
- Invite traffic noise staff; utilize traffic noise PI materials



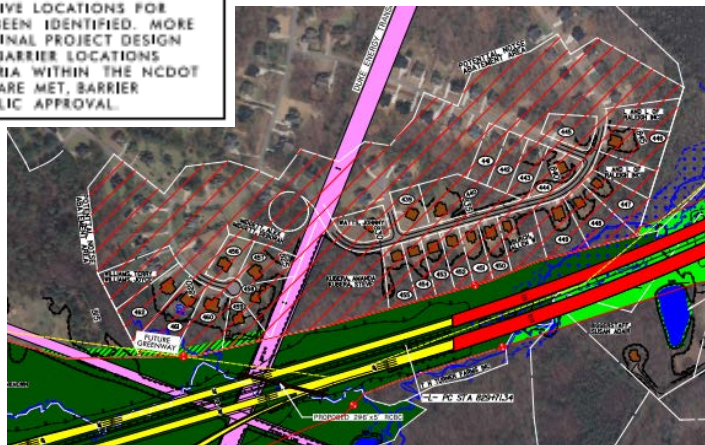
# Public Involvement

## Public Hearings

- Preliminary noise study
- EA, DEIS is complete
- Potential Noise Abatement Areas on maps; noise walls not shown

### POTENTIAL NOISE ABATEMENT AREA

THE LABELED AREAS INDICATE NOISE-SENSITIVE LOCATIONS FOR WHICH POTENTIAL SOUND BARRIERS HAVE BEEN IDENTIFIED. MORE DETAILED ANALYSES WILL OCCUR DURING FINAL PROJECT DESIGN TO DETERMINE WHETHER THESE POTENTIAL BARRIER LOCATIONS MEET THE REASONABLE AND FEASIBLE CRITERIA WITHIN THE NCDOT TRAFFIC NOISE POLICY. IF THESE CRITERIA ARE MET, BARRIER CONSTRUCTION WILL OCCUR PENDING PUBLIC APPROVAL.



# Public Involvement and Balloting

## Final design

- Detailed noise abatement study
- Noise walls are shown on maps
- Balloting occurs for benefited receptors

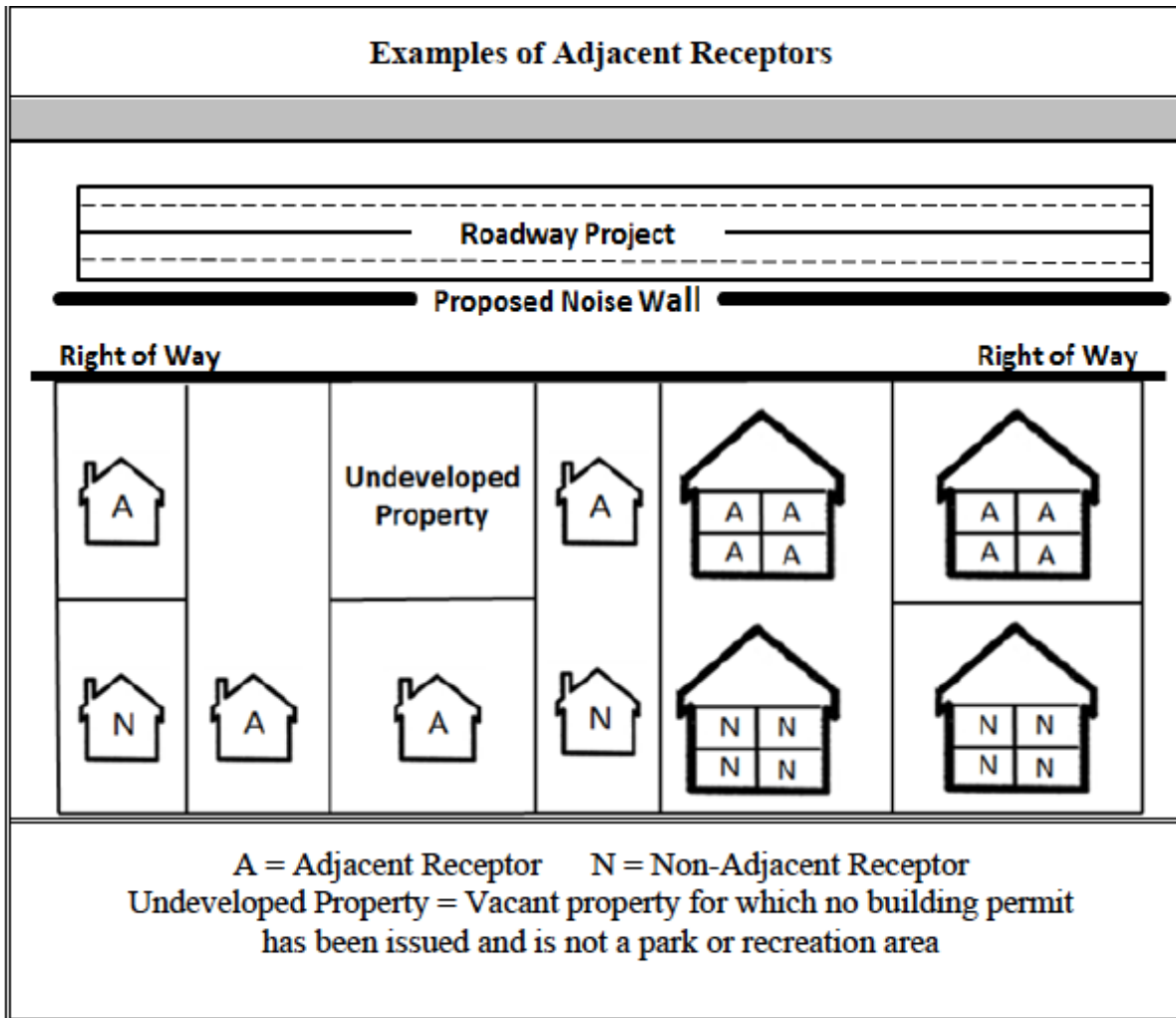




# Balloting

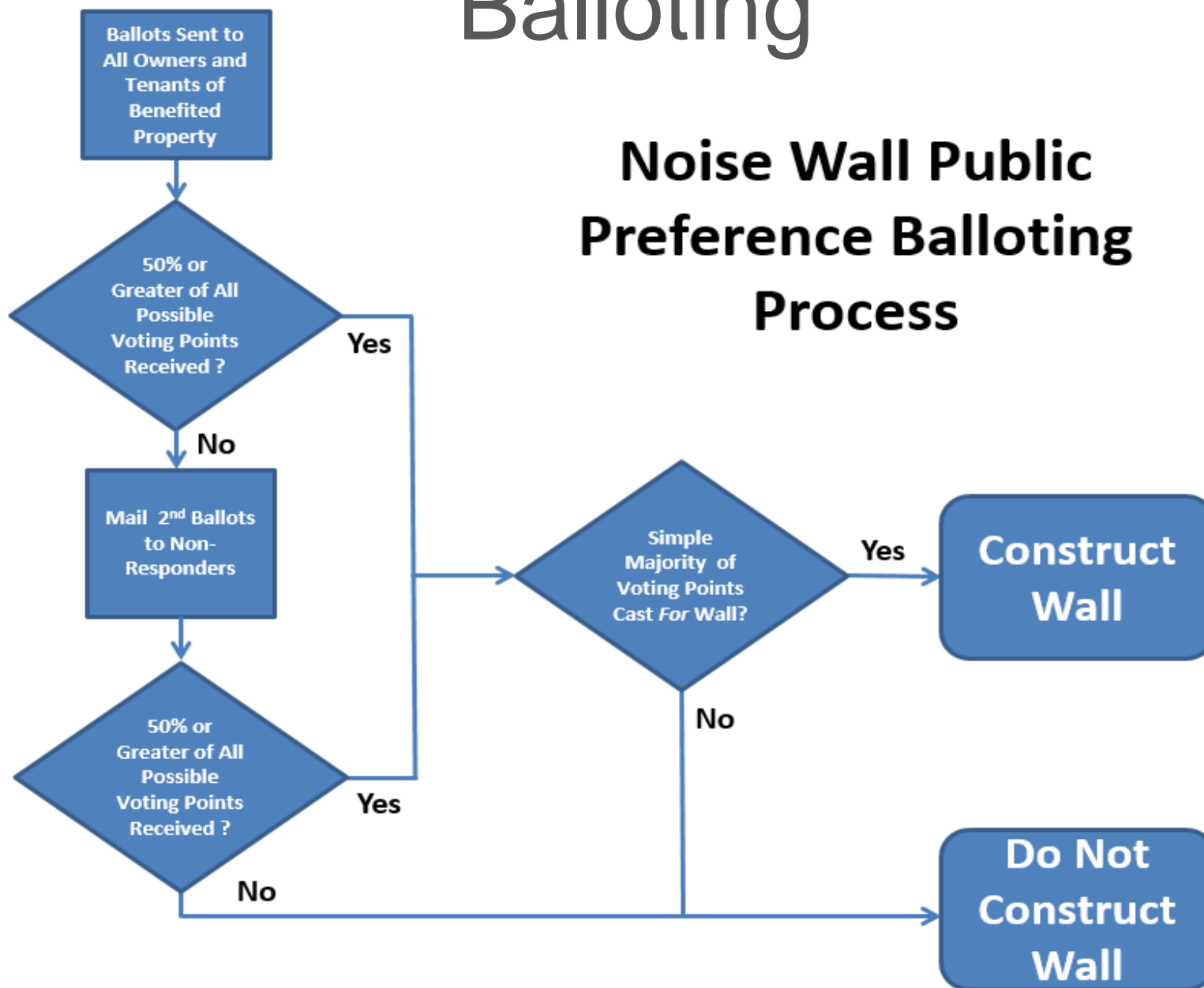
- Obtain views from property owners and tenants of benefited receptors
- Weight ballots as follows:
  - 5 points/ballot for adjacent property owners who reside at property
  - 4 points/ballot for adjacent property owners who rent property to others
  - 3 points/ballot for all non-adjacent property owners who reside at property
  - 2 points/ballot for all non-adjacent property owners who rent property to others
  - 1 point/ballot vote for all tenants of rental property
- Adjacent Receptor is a benefited receptor that
  - 1) represents a property that abuts the highway right of way or
  - 2) has no benefited receptor between it and the highway.

# Balloting



# Balloting

## Noise Wall Public Preference Balloting Process



# Public Involvement Displays and Handouts

## When is traffic noise considered?

When a project adds new travel lanes or substantially alters the location of an existing road, potential increases in traffic noise must be evaluated. If traffic noise is predicted to reach certain levels in the future after the project is in place, noise reduction measures (typically noise walls) must be considered.

Potential traffic noise increases are evaluated for noise-sensitive locations permitted before the "Date of Public Knowledge."

### WHAT IS THE "DATE OF PUBLIC KNOWLEDGE?"

This is the date that the public (and local government) is officially notified of the future path of the road.

The Date of Public Knowledge is the approval date of the final environmental document, which can be a Categorical Exclusion (CE), State or Federal Finding of No Significant Impact (FONSI), or State or Federal Record of Decision (ROD).

Development permitted after the Date of Public Knowledge is not eligible for noise abatement.

### WHERE DO I FIND MORE INFORMATION?

NCDOT's Traffic Noise Policy can be found: <https://goo.gl/fK1nkP>

Call or e-mail us for more information about NCDOT's noise policy and how it is applied. Detailed noise analysis information can also be found at the Federal Highway Administration noise website: <http://www.fhwa.dot.gov/environment/noise>

North Carolina Department of Transportation:

-  Missy Pair, P.E.  
Traffic Noise & Air Quality Group, Environmental Analysis Unit
-  1598 Mail Service Center  
Raleigh, NC 27699-1598
-  919 707 6064
-  [mpair@ncdot.gov](mailto:mpair@ncdot.gov)



# Public Involvement Displays and Handouts

## How does NCDOT decide which communities get noise walls?

### EVALUATION

To begin the process, noise experts go to homes, churches, schools, parks, and other noise-sensitive land uses that may be affected by a proposed highway project and use specialized sound meters to measure existing noise.

Next, using complex computer software, these noise measurements are then used to develop state-of-the-art models that represent local site conditions. Then the project design and anticipated future traffic volumes are added to the models so that future noise levels can be predicted.

Noise-sensitive locations potentially eligible for noise reduction measures are identified based on the Date of Public Knowledge.

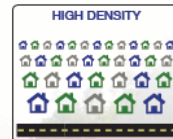
If the predicted noise increase is MORE than the level defined by NCDOT policy, ways to reduce the noise (such as constructing a noise wall) are considered at all eligible locations.

### CONSIDERATIONS

Once NCDOT has completed the technical evaluation, the following questions are to be considered:

- Will a noise wall reduce the noise enough to justify its construction?
  - Sometimes, no wall can be engineered that reduces the noise enough to be considered effective.
- Is a noise wall technically realistic?
  - Every road is different—sometimes the terrain or other obstacles (i.e., utilities) make building a wall difficult.
- How many people will benefit from a reduction in noise? Is the number high enough to justify the cost?
  - The state cannot justify the expense if the cost is too high when compared to the benefits received. Noise walls currently cost about \$3 million per mile.
- Does a simple majority of property owners and tenants who would be benefited by a 5 db(A) or better noise level reduction due to noise wall construction actually want the wall?
  - Public preference for or against a wall is obtained through the balloting process.

#### DENSITY AND DISTANCE ARE TWO FACTORS THAT CAN AFFECT THE LIKELIHOOD OF QUALIFYING FOR A NOISE WALL



Likely — a wall could reduce noise at many houses.



Unlikely — the cost of a wall would be high compared to how few houses would benefit



Unlikely — although there are many houses, they are too far from the highway for a wall to reduce noise enough.



# Public Involvement Displays and Handouts

## What are the measures to reduce traffic noise?

There are many ways to reduce traffic noise. Noise walls are one tool, but earth berms and highway design modifications can help reduce traffic noise as well. Sometimes, noise walls simply will not reduce noise levels because of the location of the road, nearby buildings and other surrounding features such as hills and valleys. Each new road must be examined individually to determine what measures can be taken.

### ARE THERE ALTERNATIVES TO NOISE WALLS?

Other options also may help reduce traffic noise. Some of these may be provided by NCDOT, and others are alternatives that might be considered by private developers or homeowners.

- ▶ Land use design — setting homes back farther from the road or separating them from the road by other development that is not noise-sensitive may reduce traffic noise levels.
- ▶ Earth berms — long mounds of soil built parallel to a highway. Because of the amount of land required and the land's cost, berms are rarely the most practical solution to highway noise.
- ▶ Pavement types — research is continually being conducted to develop different types of pavement that might reduce traffic noise.
- ▶ Types of vehicles/speed limits — noise can be reduced with lower speed limits and truck restrictions on a highway. However, reducing the speed limit below the appropriate speed for which a highway is designed will have only a moderate effect on traffic noise and may have other adverse effects, such as an increase in the number of accidents on the roadway.
- ▶ Building insulation — upgrading noise insulation in buildings, such as replacing doors and windows or adding insulation to walls and attics.

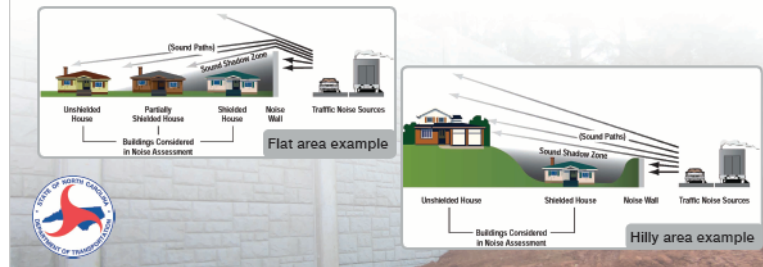
### WHEN DO NOISE WALLS WORK?

Sound travels very much like water or light, following the easiest path over, under, and around obstacles. The further people are away from the source of the sound, the lower the noise level they will hear.

Noise walls are more effective if the source of the noise cannot be seen. They will not work if there are gaps in the wall. The noise will simply travel through that opening much like water will flow through a crack in a dam. If a building is located higher than a noise wall, the noise will flow over the wall to the building.

The graphics below show two examples of when noise walls located between houses and a road will or will not shield the houses.

Noise walls do not completely eliminate all noise.



# Public Involvement Displays and Handouts

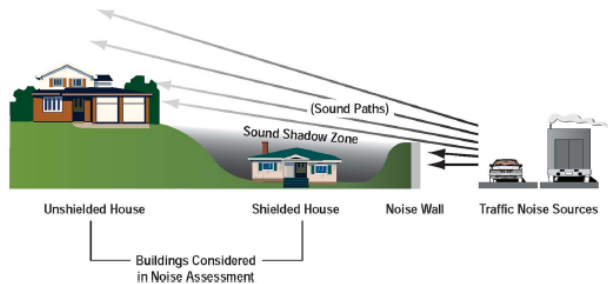
## WHEN DO NOISE WALLS WORK?

Sounds travels very much like water or light, following the easiest path over, under, and around things in its path. The further people are away from the source of the sound, the lower the noise level they will hear.

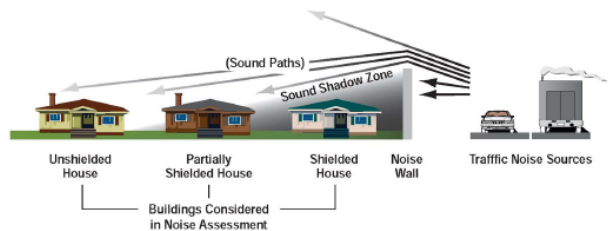
Noise walls do not work if the source of the noise can be seen. They will also not work if there are gaps in the wall. The noise will simply travel through that opening much like water will flow through a crack in a dam. If a building is located higher than a noise wall, the noise will flow over the wall to the building.

The graphics below show two examples of when noise walls located between houses and a road will or will not shield the houses.

Noise walls do not completely eliminate all noise.



Hilly Area Exam



Flat Area Example



North Carolina Department of Transportation

## Answering Your Questions About HIGHWAY TRAFFIC NOISE



### HOW DOES NCDOT ADDRESS TRAFFIC NOISE?

There are many ways to reduce traffic noise. Noise walls are one tool, but earth berms and highway design modifications can help reduce traffic noise as well. Sometimes, noise walls simply will not reduce noise levels because of the location of the road, nearby buildings and other surrounding features such as hills and valleys. Each new road must be examined individually to determine what measures can be taken. This pamphlet briefly describes how NCDOT determines when a noise wall should be built, and provides contact information if you have more questions.

### WHERE DO I FIND MORE INFORMATION ABOUT NCDOT'S TRAFFIC NOISE POLICY?

NCDOT's Traffic Noise Policy can be found at <https://go.g/fK1nKp>

North Carolina Department of Transportation

Missy Pair, PE  
 Traffic Noise & Air Quality Group  
 Environmental Analysis Unit  
 1598 Mall Service Center  
 Raleigh, N.C. 27699-1598  
 Phone: 919-707-6064  
 E-Mail: [mpair@ncdot.gov](mailto:mpair@ncdot.gov)

Call or e-mail us for more information about NCDOT's noise policy and how it is applied. Detailed noise analysis information can also be found at the Federal Highway Administration noise website.

<http://www.fhwa.dot.gov/environment/noise>

# Public Involvement Displays and Handouts

## WHEN ARE NOISE WALLS CONSIDERED?

When a project adds new travel lanes or substantially alters the location of an existing road, potential increases in traffic noise must be evaluated. If traffic noise is predicted to reach certain levels in the future after the project is in place, noise reduction measures (typically noise walls) must be considered.

Potential traffic noise increases are evaluated for noise-sensitive locations permitted before the "Date of Public Knowledge."

## WHAT IS THE "DATE OF PUBLIC KNOWLEDGE?"

This is the date that the public (and local government) is officially notified of the future path of the road.

The Date of Public Knowledge is the approval date of the Final Environmental Document, which can be a Categorical Exclusion (CE), State or Federal Finding of No Significant Impact (FONSI), or State or Federal Record of Decision (ROD).

Development permitted after the Date of Public Knowledge is not eligible for noise abatement.

## HOW IS TRAFFIC NOISE EVALUATED?

To begin the process, noise experts go to homes, churches, schools, parks, and other noise-sensitive land uses that may be affected by a proposed highway project and use sound meters to measure existing noise.

Next, using complex computer software, these noise measurements are then used to develop state-of-the-art models that accurately represent local site conditions. Then the project design and anticipated future traffic volumes are added to the models so that future noise levels can be predicted.

Noise-sensitive locations eligible for noise reduction are identified based on the Date of Public Knowledge.

If the predicted noise increase is MORE than the level defined by NCDOT policy, ways to reduce the noise are considered at all eligible locations.

## ARE THERE OTHER OPTIONS TO REDUCE NOISE?

Other options may also help reduce traffic noise. Some of these may be provided by NCDOT, and others are alternatives that might be considered by private developers or homeowners.

- **Land use design** – setting homes back further from the road or separating them from the road by other development that is not noise-sensitive may reduce traffic noise levels.
- **Earth berms** – long mounds of soil built parallel to a highway. Because of the amount of land required and the land's cost, berms are rarely the most practical solution to highway noise.
- **Pavement types** – research is continually being conducted to develop different types of pavement that might reduce traffic noise.
- **Types of vehicles/speed limits** – noise can be reduced with lower speed limits and truck restrictions on a highway. However, reducing the speed limit below the appropriate speed for which a highway is designed will have only a moderate effect on traffic noise and may actually increase the number of accidents on the roadway.
- **Building insulation** – upgrading noise insulation in buildings, such as replacing doors and windows or adding insulation to walls and attics.

## HOW DOES NCDOT DECIDE WHICH COMMUNITIES GET NOISE WALLS AND WHICH DO NOT?

Once NCDOT completes the technical evaluation, it also considers the following questions:

- Will a noise wall reduce the sound enough to justify its construction? Sometimes, a noise wall simply will not reduce the noise enough.
- Is a noise wall technically realistic? Every road is different – sometimes the terrain or other obstacles such as utilities makes building a wall difficult.
- How many people will benefit from a reduction in noise? Is the number high enough to justify the cost? The state cannot justify the expense if the cost is too high when compared to the benefits received. Noise walls currently cost about \$3 million per mile.
- Does a simple majority of property owners and tenants who receive a predicted noise level reduction due to construction of a noise wall actually want the wall? Public preference for or against a wall is obtained through a balloting process.

## WHAT AFFECTS THE LIKELIHOOD OF A NOISE WALL BEING RECOMMENDED?

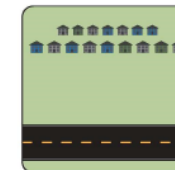
**Density and distance** are among the factors that affect the likelihood of a wall.



**Likely** – a wall could reduce noise at many houses.



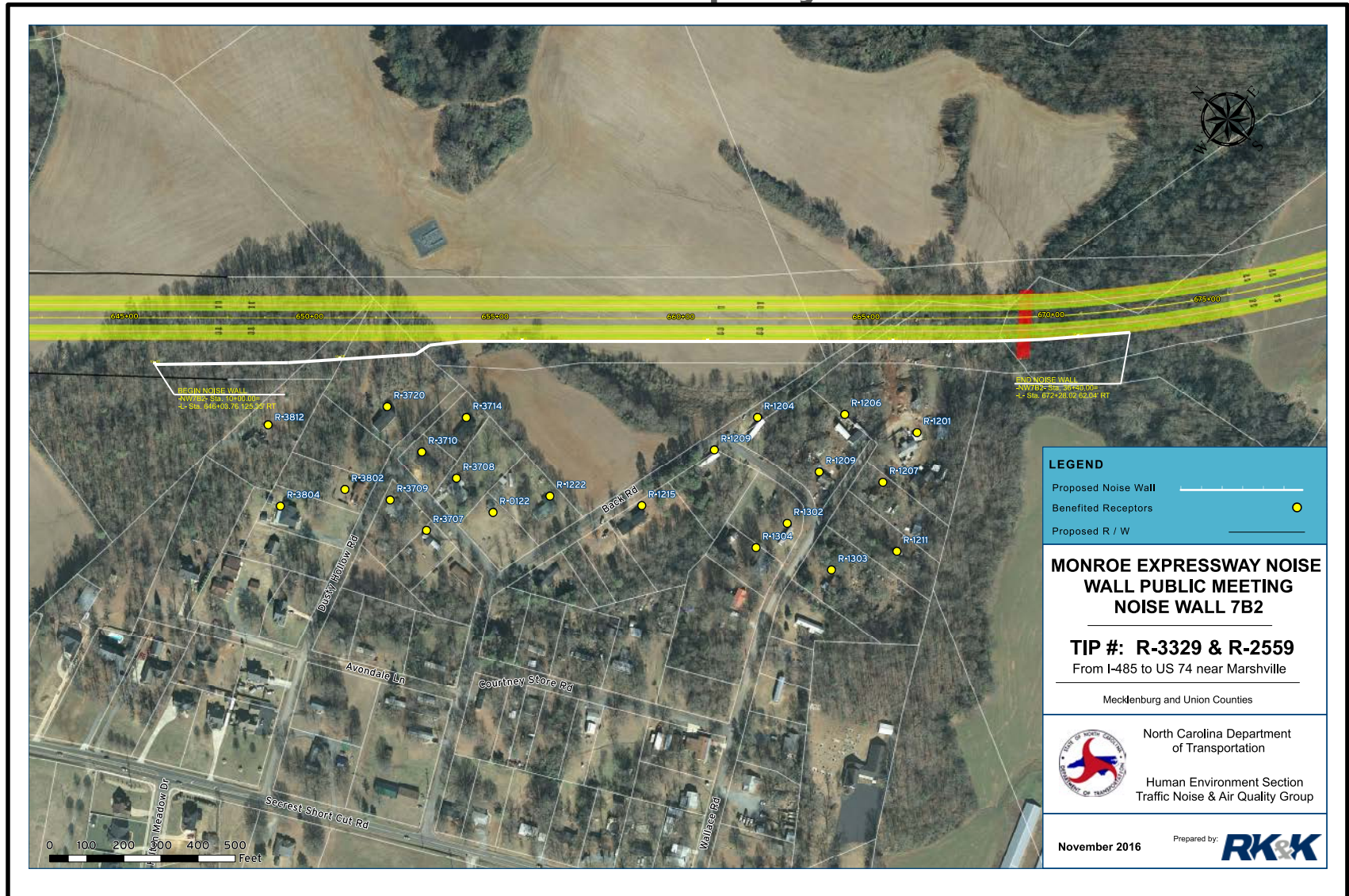
**Unlikely** – the cost of a wall would be high compared to how few houses would benefit



**Unlikely** – although there are many houses, they are too far from the highway for a wall to reduce noise enough.



# Public Involvement Displays and Handouts



**LEGEND**

Proposed Noise Wall

Benefited Receptors ●

Proposed R / W


**MONROE EXPRESSWAY NOISE WALL PUBLIC MEETING NOISE WALL 7B2**

**TIP #: R-3329 & R-2559**  
From I-485 to US 74 near Marshville

Mecklenburg and Union Counties

North Carolina Department of Transportation

Human Environment Section  
Traffic Noise & Air Quality Group



November 2016 Prepared by: **RK&K**

# Key Links

[NCDOT Traffic Noise Policy \(2016\)](#)

[Guidance and Procedures \(including Air and Noise\)](#)

At this 2<sup>nd</sup> link, various resources can be found,  
including:

TNR and DNR scope templates, 2016 Traffic Noise Manual, 2011 Traffic Noise Abatement Policy, and 2011 Traffic Noise Abatement Manual

# Additional Information?

**Missy Pair, PE**

Traffic Noise & Air Quality Group Leader

Environmental Analysis Unit

(919) 707-6064

[mpair@ncdot.gov](mailto:mpair@ncdot.gov)

OR

**Tracy Roberts, AICP**

Senior Traffic Noise & Air Quality Specialist

919-707-2728

[teroberts1@ncdot.gov](mailto:teroberts1@ncdot.gov)