Route 7 Corridor Improvements Project
UPC 52328

Public Information Meeting
Noise Study Overview

June 16, 2016

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Senior Noise Analyst - McCormick Taylor

ROUTE 7 CORRIDOR IMPROVEMENTS

VDOT

Please Note:

- **Noise study information presented is preliminary and subject to change**
- **Potential noise walls shown on tonight's plans are not a guarantee of their construction**
- **Remaining tasks include:**
  - **Completion of the noise study in the upcoming *Detailed Design Phase***
  - **Engineering/constructability reviews**
  - **Voting by benefitted property owners**

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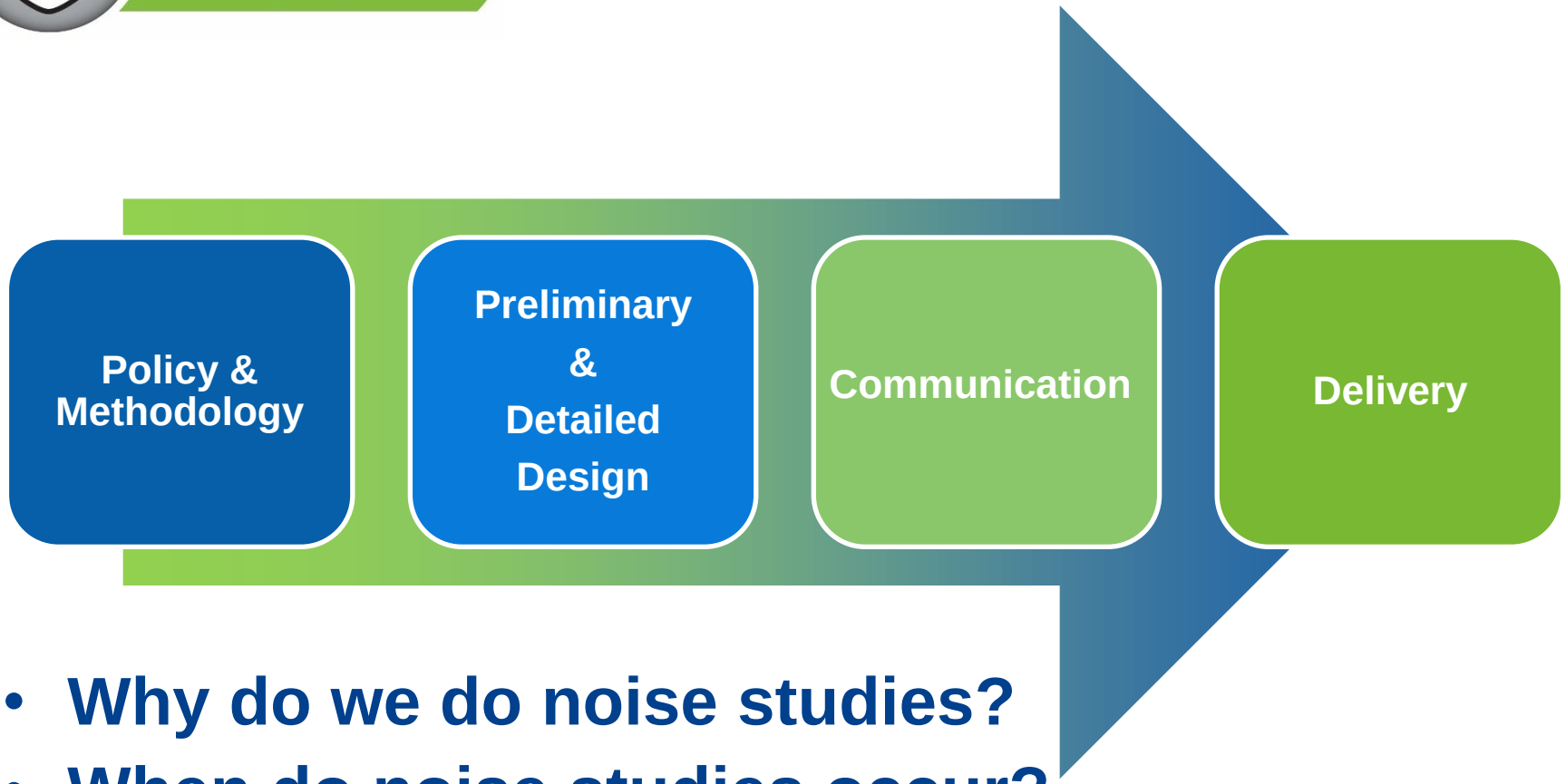
Presentation Summary



- Why do we do noise studies?
- When do we do noise studies occur?
- What are the outcomes?

Noise Policy

- **State Noise Abatement Policy**
  - Highway Traffic Noise Impact Analysis Guidance Manual
  - July 2015 (Version 7)
- **Type I Federal-Aid Project**
  - VDOT only constructs noise walls for Type I projects
  - Route 7 CIP is a Type I project since it adds through lanes

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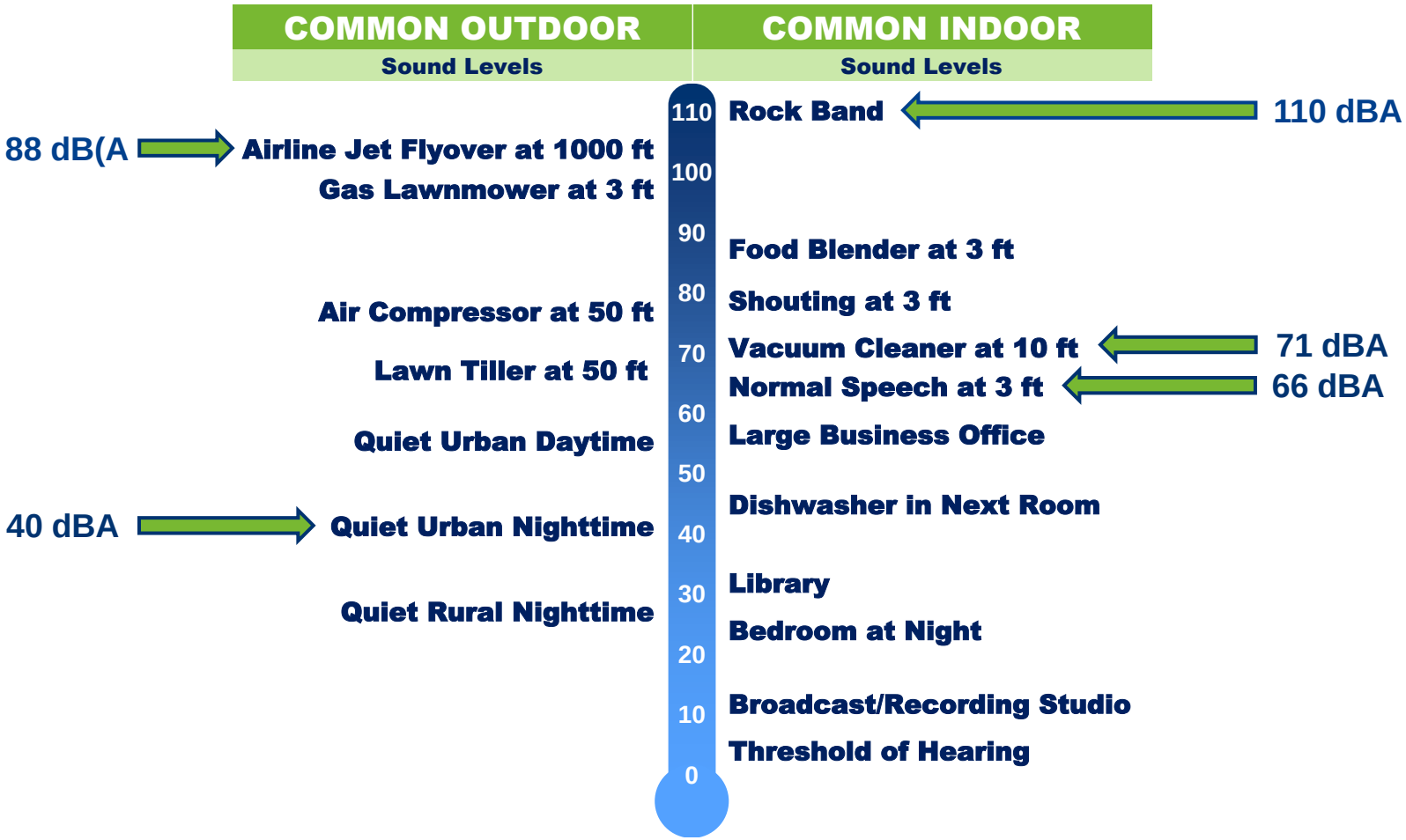
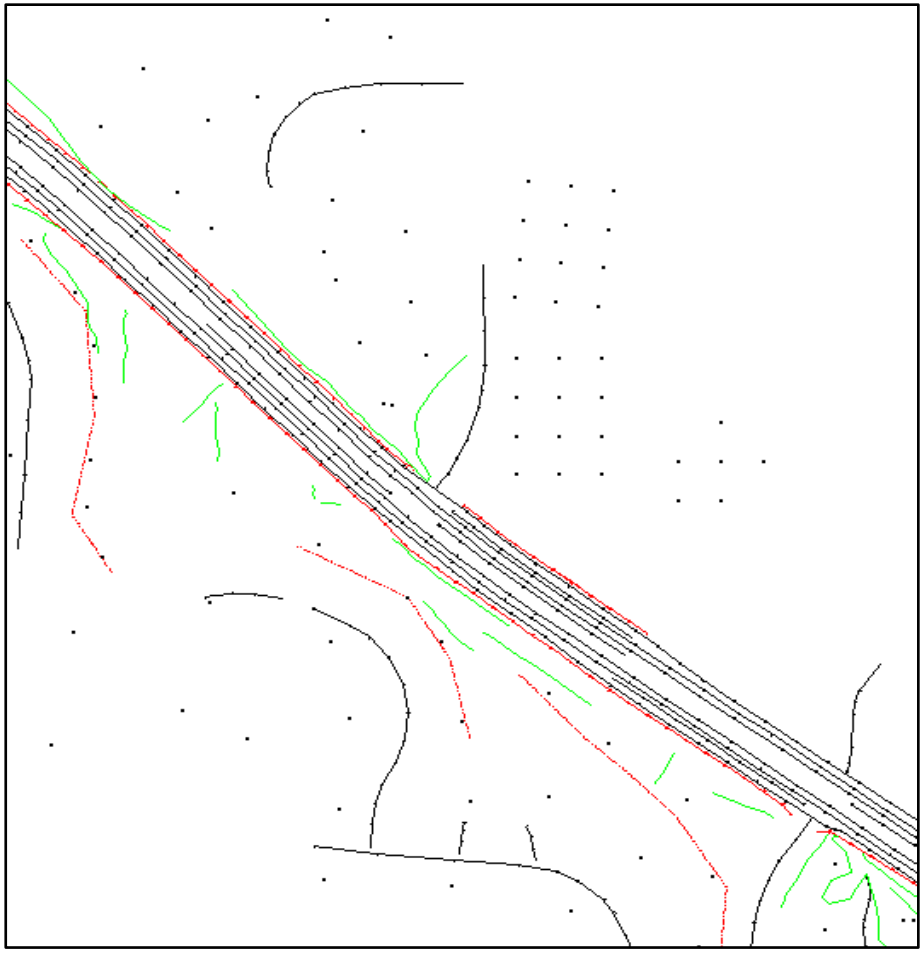
Noise Level dB(A)



Preliminary Design

- **Traffic – Existing Year (2015), Design Year (2040)**
  - 24-hour Volumes
  - Uninterrupted Speeds
  - Truck Percentages
  - Worst noise hour may not be peak-traffic hour
- **Design Files and Survey**
  - Plans
  - Profiles
  - Cross-sections
  - Survey

Traffic Noise Model 2.5 (TNM)



- **FHWA Developed**
  - Predicts and assesses noise levels for future design year
  - Rigorous validation testing performed
  - FHWA required use in April ’04
- **Inputs**
  - Noise sensitive receptors
  - Proposed design
  - Peak Hour Traffic (volume, speed, % trucks, etc)
  - Existing or prop barriers
  - Propagation features (cut/fill lines, structures, ground zones, etc.)

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Sample Graphics

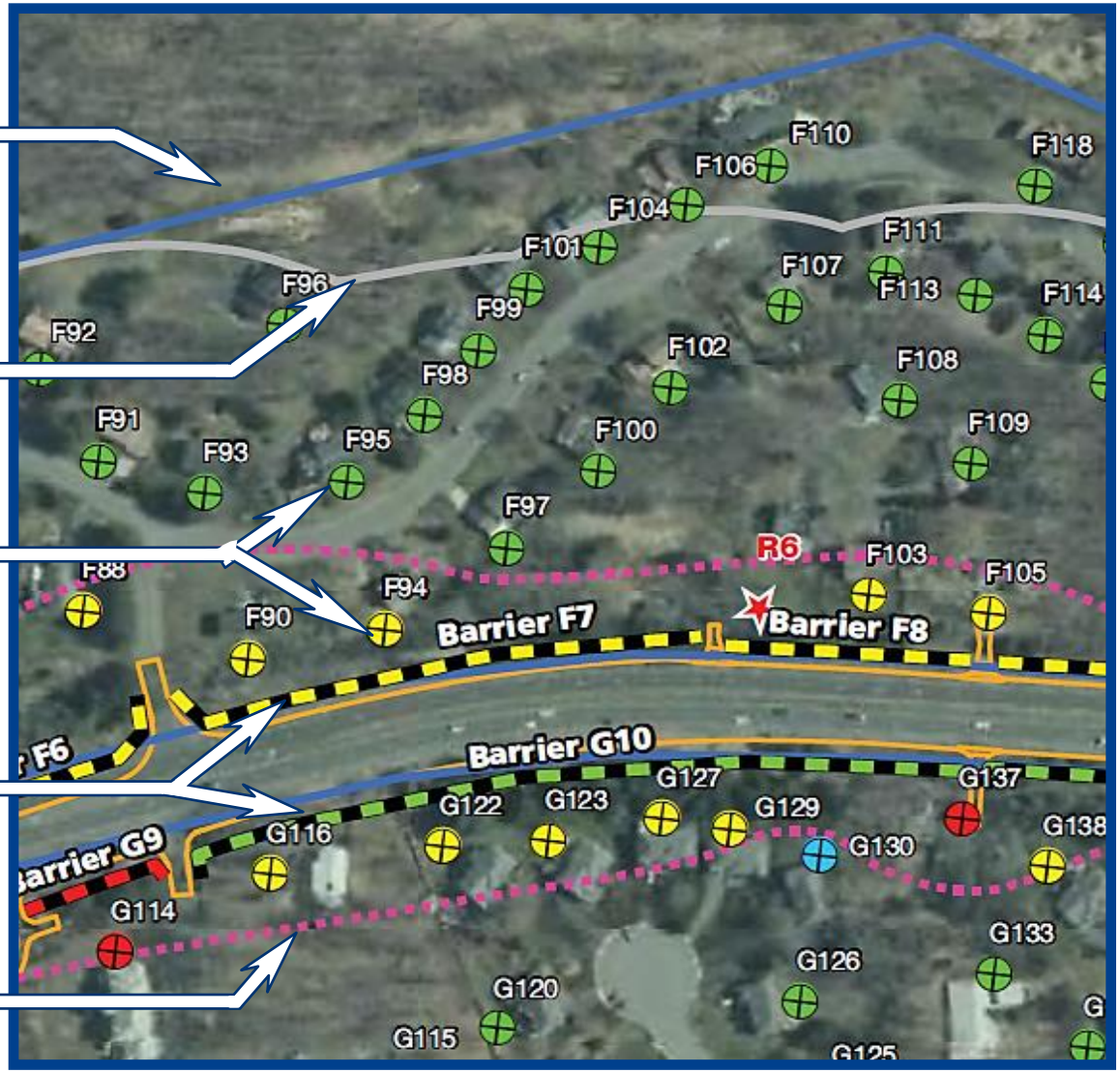
Common Noise Environment (CNE) limit

500 ft Boundary

Modeled receptors

Barrier/Feasibility

66 dB(A) Contour



Preliminary Design

- **Receptors/Receivers**
  - How many residences per receptor?
  - Why do parks and places of worship have more receptors than a residential home?
- **Warranted (AKA Noise Impact)**
  - Approach or exceed FHWA Noise Abatement Criteria
  - 10 decibel increase above existing
  - Section 4(f) – 3 dB(A) between build and no-build

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Federal Noise Criteria

Activity Category	Activity Leq (h)	Evaluation Location	Description of Activity Category
A	57	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*	67	Exterior	Residential
C*	67	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E*	72	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---	Exterior	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship-yards, utilities (water resources, water treatment, electrical) and warehousing
G	---	---	Undeveloped lands that are not permitted

Source: 23 CFR Part 772

* Includes undeveloped lands permitted for this activity category

Is the Wall Feasible?

- **Feasible**
  - **Does it work acoustically?**
    - **VDOT requires that 50% or more of the impacted receptors experience 5 dB(A) or more of insertion loss to be feasible;**

AND

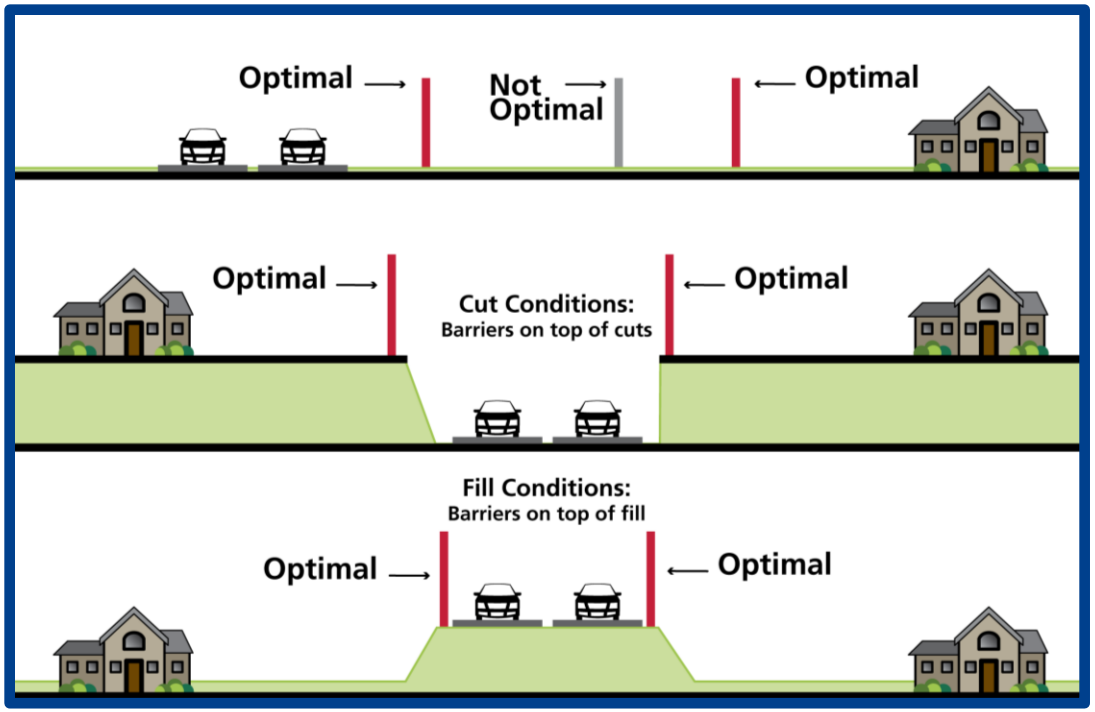
  - **Can it be constructed?**
    - **Factors related to design and construction include: safety, barrier height, topography, drainage, utilities, and maintenance of the abatement measure, maintenance access to adjacent properties, and general access to adjacent properties**

Is the Wall Reasonable?

- **Reasonable**
  - Cost-effectiveness
    - Maximum 1,600 sq ft or less per benefited residence
  - Design goal
    - 7 decibels of noise reduction at 1 impacted receptor
  - Viewpoints of the benefited receptors
    - Democratic vote
    - 50% of the benefited respondents must favor construction
    - Partial mitigation may occur as a result of the vote

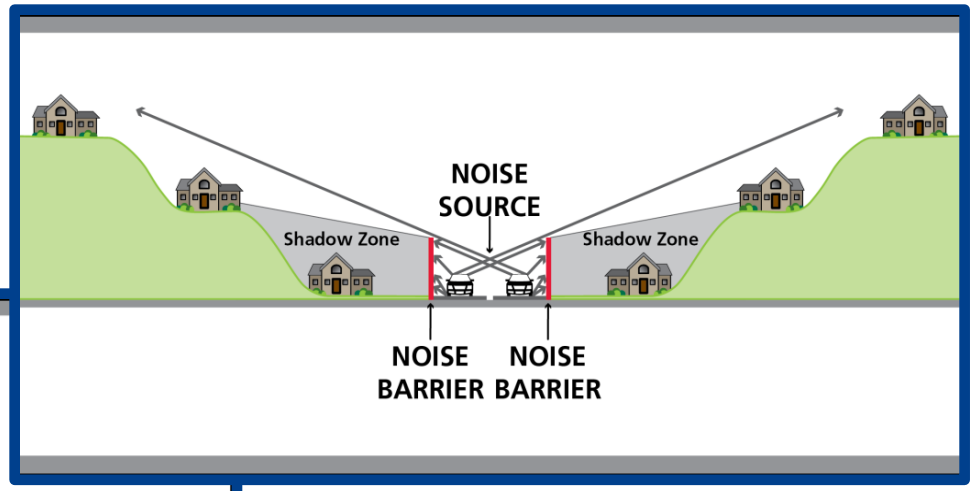
Noise Mitigation

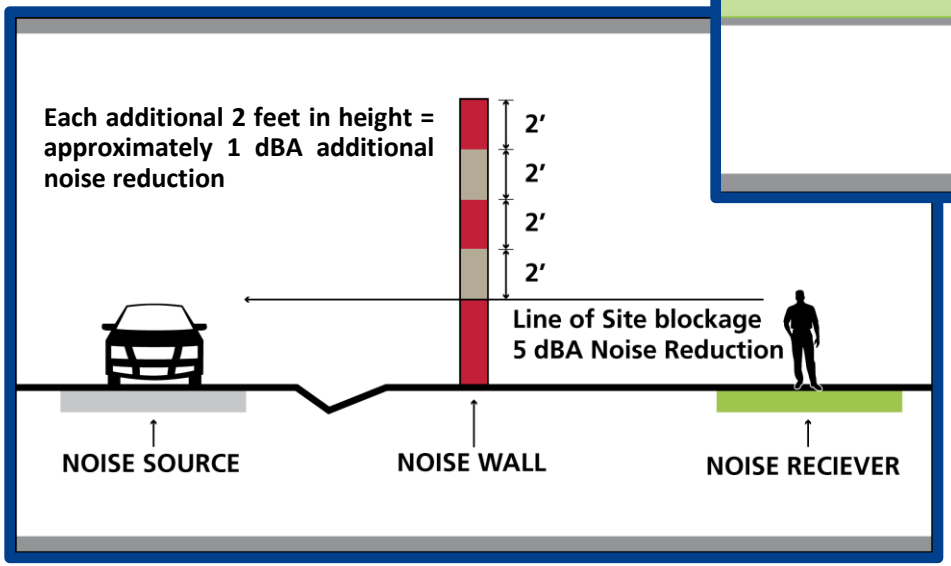
- **Where do we place the sound wall?**
  - **Between the source and the receptor**
- **Is there an optimal location?**



Noise Mitigation

- **How high should the wall be?**
  - **Depends on where noise impacts occur**





- **Was line of sight broken?**
- **Reflection considered?**

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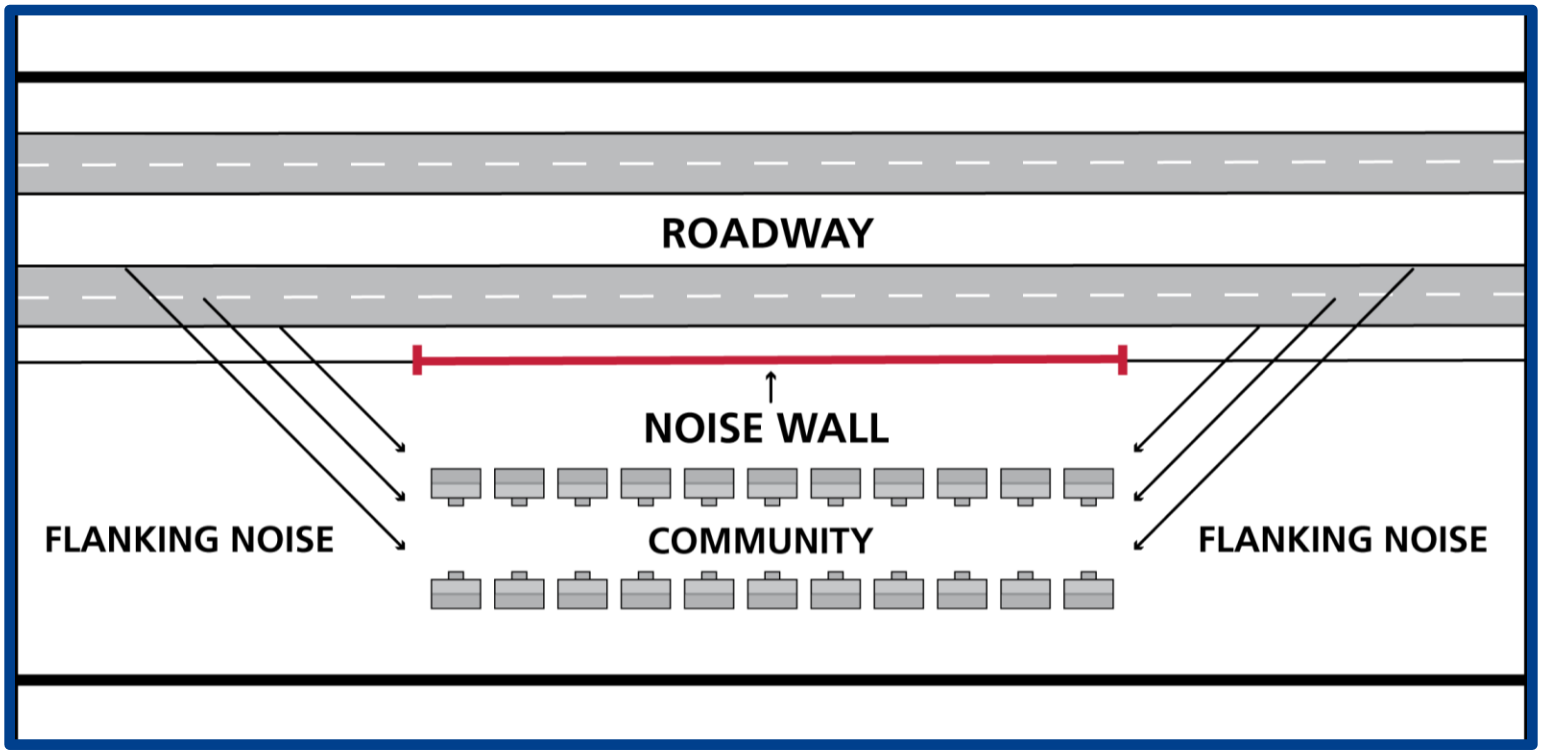
Noise Mitigation

- **How long should the wall be?**
  - **Flanking Noise**



Detailed Design

- **Reasonable**
  - **Cost-effectiveness**
    - **1,600 maximum square ft or less per benefited residence**
  - **Design goal**
    - **7 decibels of noise reduction at 1 impacted receptor**
  - **Viewpoints of the benefited receptors**
    - **Democratic vote**
    - **50% of the benefited respondents must favor construction**
    - **Partial mitigation may occur as a result of the vote**

Detailed Design

Post Public Hearing

- **Right of Way**
  - Construction/maintenance easements - how much easement will be required behind the barrier?
- **Utilities**
  - Are there utilities to be relocated in the area?
- **Special Provisions**
  - Aesthetic Treatment(s)
  - May reflect desires of Residents/Locality
- **Aesthetics Manual**
  - http://www.virginiadot.org/business/resources/bridge/Manuals/Part12/Part12.pdf

Sample Wall Finish

- **Rte. 7 over DTR -Major Bridge Rehabilitation**
  - **Others treatments available**

Sample Wall Finish

- **Route 7 from Rolling Holly Dr to Reston Ave**
  - **Others treatments available**

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  - **Voting by benefitted property owners**

Thank you

Please address any questions you may have to the individuals at the boards.