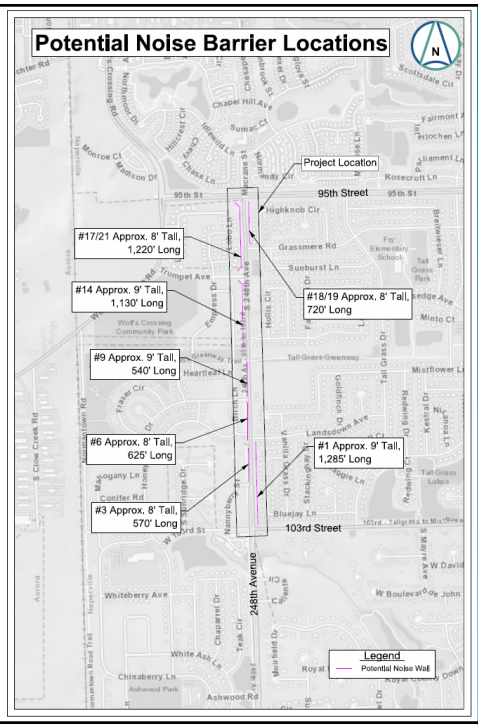
Project Background

- 248th Avenue Phase I Study
- Various Environmental Studies
  - Highway Traffic Noise Analysis
- Identify Traffic Noise Impacts and Recommend Noise Walls where Feasible and Reasonable

Purpose of Meeting

Determine Viewpoints of ***Benefited*** Residents For or Against Noise Walls



Meeting Agenda

- Presentation
- General Questions & Answers
- View Exhibits & Discuss Specifics with Staff
- Complete and Submit Viewpoint Form

City of Naperville
248th Avenue Phase I Study

BENEFITED RECEPTOR VIEWPOINT FORM

1. **Are you in favor or not in favor of the construction of a noise wall as part of the proposed roadway improvement that will mitigate highway noise at your residence?**
   - ☐ Yes, I am in favor of the construction of the noise wall.
   - ☐ No, I am not in favor of the construction of the noise wall.
2. **Please check one of the following.**
   - ☐ I am the owner of this house and I live in the house.
   - ☐ I am the owner of this house, but I rent it to someone else.
   - ☐ I rent this house or apartment from someone else.
3. **Required:**

Name:
Address:
City, State, Zip:
Signature: Date:

SAMPLE ONLY

4. **Optional:**

Phone: E-mail address:

5. **Comments:**

Viewpoint forms will only be considered from those residents who received a letter via certified mail stating that their house would be benefited by a noise wall as part of the proposed 248th Avenue improvement.

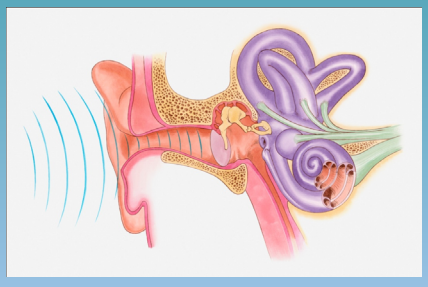
Completed forms may be deposited in the box at the viewpoint meeting. They may also be mailed, hand-delivered, or scanned and e-mailed to the following location, and must be received no later than 5:00 P.M. on September 23, 2022.

City of Naperville
Mr. William Novack
400 S. Eagle Street
Naperville, Illinois 60540
novackw@naperville.il.us

Attachment 3

Highway Noise Concepts

- Sound vs. Noise
  - Sound: Pressure wave in the air
  - Noise: Pressure wave that contacts ear
- Magnitude
  - How “loud” or “soft” is the noise?
- Duration
  - Over what period of time does the noise occur?



Magnitude

- "Loudness"

Magnitude

- "Loudness"
- Decibels, or dB
- Changes in Sound Level
  - Less than 3 dB – *Not Perceptible*
  - 5 dB – *Readily Perceptible*
  - 10 dB – *Double or Half*
- Addition of Sound Levels
  - 60 dB + 60 dB = 63 dB
    Not 120 dB

Factors Affecting Magnitude

- Vehicle Volume
  - Double Traffic Volume = 3 dBA Increase


60 dB + 
60 dB = 63 dB *(3 dB increase)*

  - Cut Traffic Volume in Half = 3 dBA Decrease

- Traffic along 248th Avenue is projected to increase by about 35% by 2050 with the proposed widening.

Factors Affecting Magnitude

- Vehicle Speeds

Traffic at 65 mph…

Sounds "twice as loud" as…

Traffic at 30 mph.

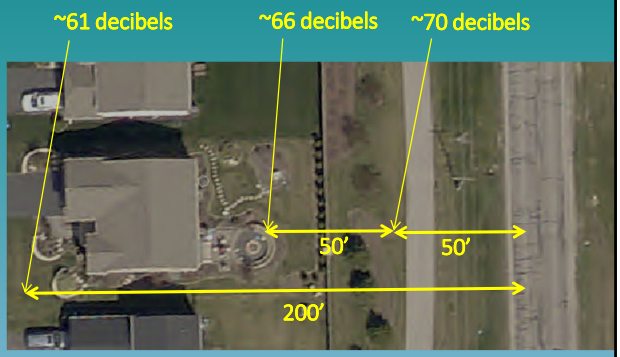
- Vehicle Mix

One Large Truck at 55 mph…
Sounds "as loud" as…
28 Cars at 55 mph.

 = 

Factors Affecting Magnitude

- Distance From Traffic Noise
  - Double Distance = 4.5 dB Reduction
  - Noise levels quickly drop off as distance from roadway increases
  - Noise typically not described as an interference 200 to 300 feet away from an arterial roadway



Note: Hypothetical Example, Not Actual Noise Levels

Factors Affecting Magnitude

- Vegetation
  - Requires Dense Stand 100 to 200 feet deep and 16 to 18 feet high for a noticeable attenuation
  - Screening can provide a psychological noise reduction effect: "*Out of Sight, Out of Mind*"

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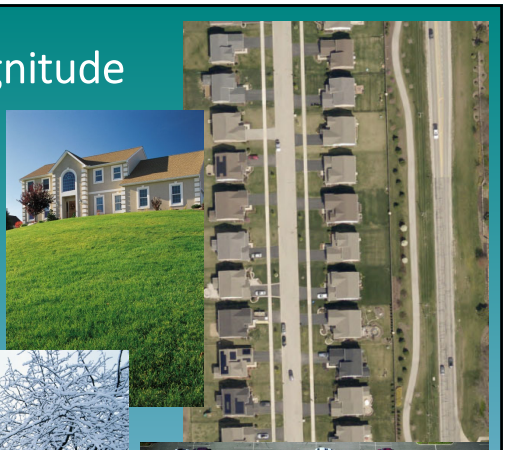
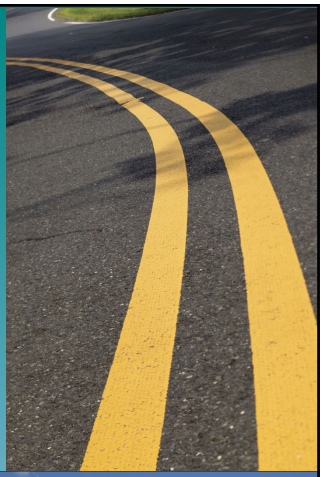
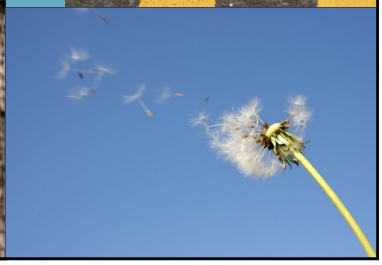
- Intervening Features
  - Human-made or Natural
  - Intervening Ground Type




Factors Affecting Magnitude

- Vegetation
  - Requires Dense Stand 100 to 200 feet deep and 16 to 18 feet high for a noticeable attenuation
  - Screening can provide a psychological noise reduction effect: "*Out of Sight, Out of Mind*"
- Intervening Features
  - Human-made or Natural
  - Intervening Ground Type
- Road Pavement Type
- Atmospheric Effects
  - Temperature, Wind



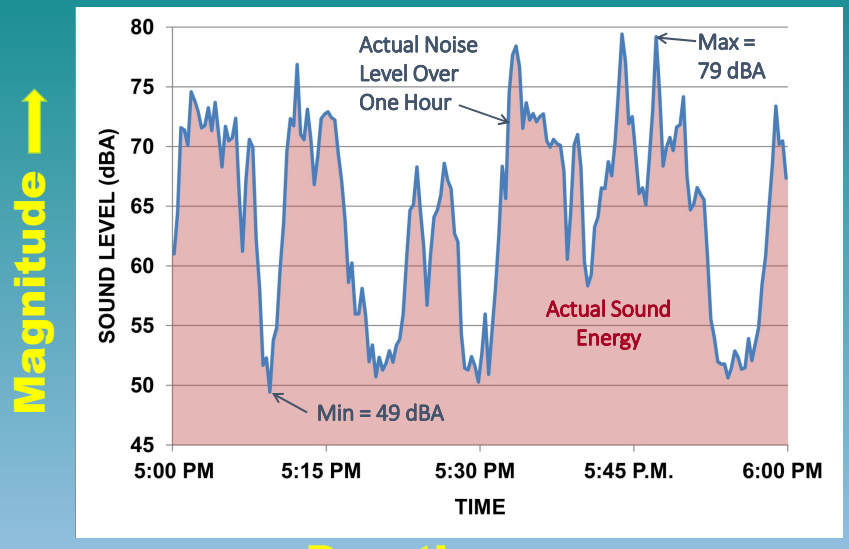
Highway Traffic Noise Descriptor

Leq(h) = 64 dBA

or simply

"Noise Level is 64 decibels"

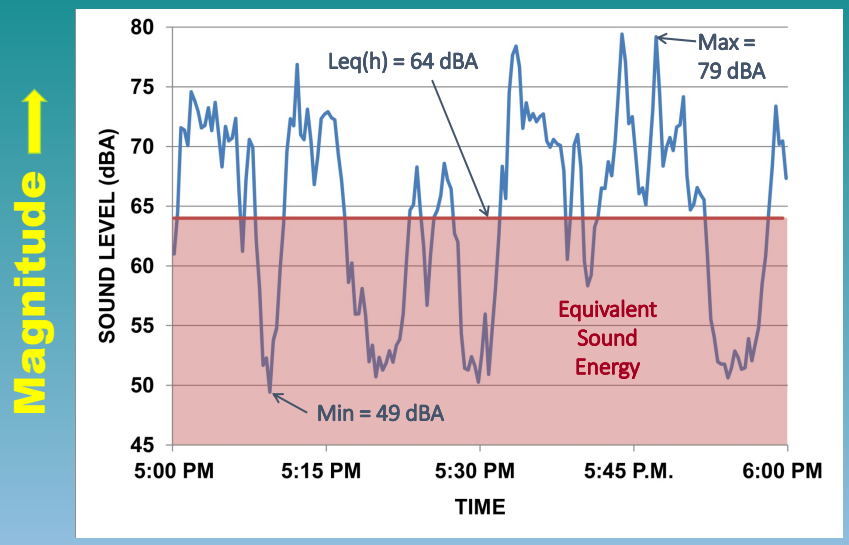
Actual vs. Hourly Equivalent Noise Level



Magnitude ⟶

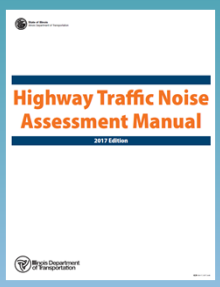
Duration ⟶

Actual vs. Hourly Equivalent Noise Level



Highway Noise Policies

- Federal
  - U.S. Code of Federal Regulations (23 CFR 772)
  - Any project using Federal funds must conform
  - Updated in July 2010, effective July 2011
- State
  - Highway Traffic Noise Assessment Manual



Impact Evaluation Criteria

- FHWA Noise Abatement Criteria (NAC)
  - Residential = 67 decibels
  - Sensitive Commercial = 72 decibels
  - Areas that are not Noise Sensitive = No Abatement Evaluated
- Selection of Receptor Locations
  - Exterior Areas of Human Activity
  - Typically a rear patio or deck
  - Five feet above ground

Impact Evaluation Criteria

- Traffic Noise Impact is Predicted if:
  1. Future Noise Level approaches or exceeds the FHWA Noise Abatement Criterion
     - "Approach" = Within 1 decibel of 67 dBA
     - Equal to or greater than 66 dBA

~ OR ~

  2. Future Noise Level substantially exceeds the Existing Noise Level
     - Greater than 14 dBA over Existing

- If either of these conditions exist, must consider noise abatement.

Traffic Noise Model

- FHWA Traffic Noise Model (TNM 2.5)
- Inputs
  - Roadways
  - Traffic Volumes, Classifications, Speed
  - Intervening Buildings, Existing Barriers
  - Tree Zones
  - Terrain Lines
  - Ground type
  - Receptors
  - Potential noise walls/barriers

Traffic Noise Model

- Existing Conditions
  - Validated Using Field Noise Measurements
- 2050 No-Action Conditions
- 2050 Build Conditions
  - To Determine Where Impacts Will Occur
- 2050 Build Conditions With Noise Barrier

Analysis Results & Impacts

- Predicted noise impact at 7 residential areas
  Along both sides of 248th Avenue
  - Location #1: Bluejay Lane
  - Location #3: Nannyberry Court
  - Location #6: Birch Lane S. of Honey Locust Dr.
  - Location #9: Birch Lane N. of Honey Locust Dr.
  - Location #14: Birch Lane N. of Tall Grass Greenway Trail
  - Location #17/#21: Lobo Lane
  - Location #18/#19: Highknob Circle
- Generally, properties that have a side or back yard that is directly facing 248th Street are the impacted and/or benefited receptors.

Analysis Results & Impacts

- Existing Levels – 56 to 64 dBA
- 2050 No-Action Levels – 57 to 65 dBA
- 2050 Proposed Action Levels – 57 to 68 dBA
  - With roadway project, but without walls.
  - Increases from Existing to 2050 of 1 to 5 dBA

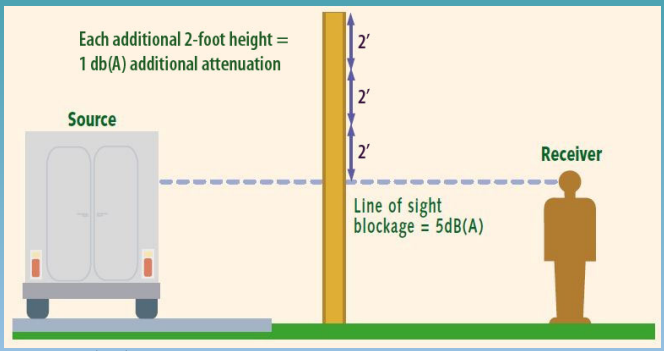
Since 2050 Proposed Action noise levels approach or exceed the FHWA NAC, noise abatement must be considered.

Abatement Consideration Process

Where Noise Impacts are expected to occur, a Noise Barrier will be recommended for construction if it is both Feasible and Reasonable.

Abatement Consideration Process

- Feasible?
  - ✓ Physically Able to Construct?
    - Safety, Clear Zones, Sight Distance, Drainage, Utilities, Driveways
  - ✓ Achieves a 5 dBA Noise Reduction at 2 Impacted Receptors?
    - Must be tall enough, long enough, and dense material
    - No openings

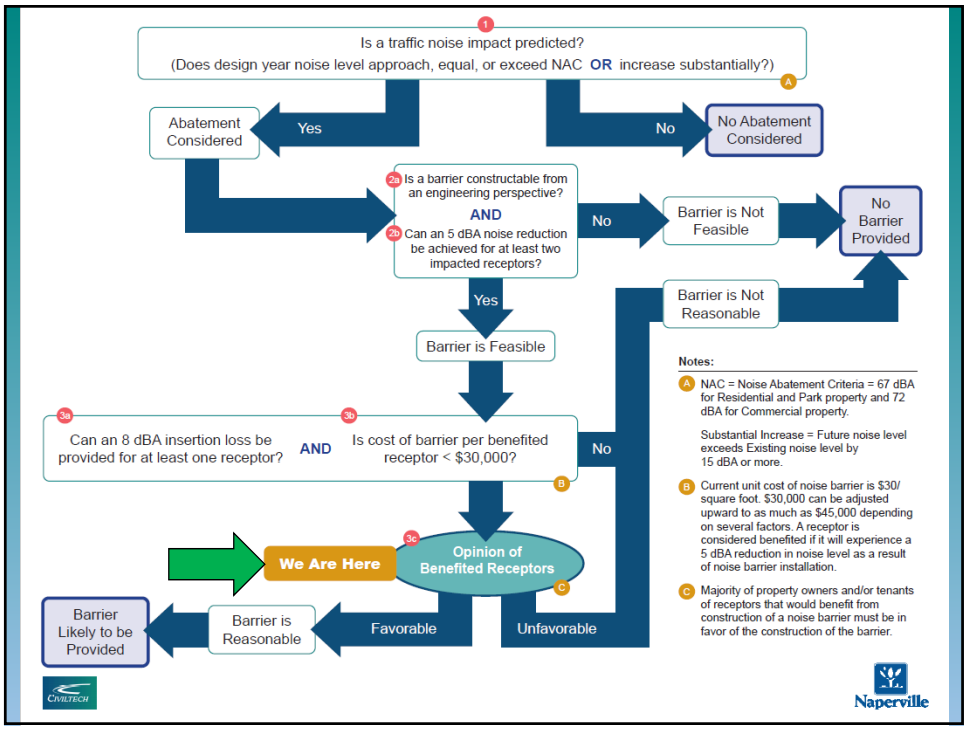


Source: FHWA (2011)

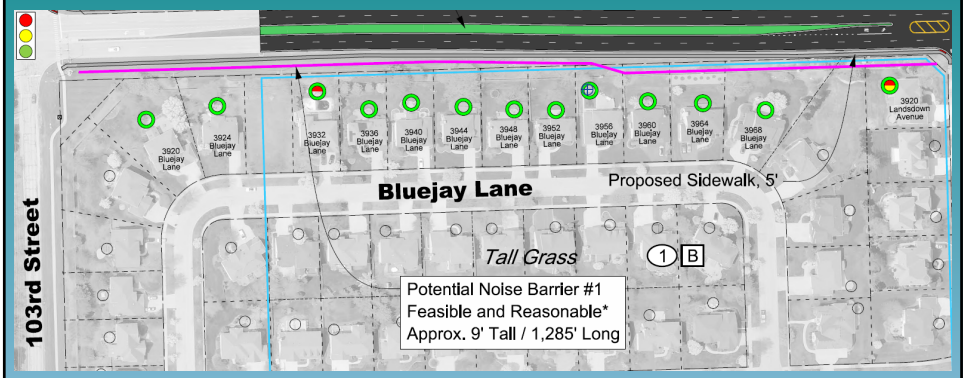
Abatement Consideration Process

- Reasonable?
  - ✓ Cost-to-Benefit Ratio?
  - ✓ Magnitude of Future Noise Level?
  - ✓ Amount of Change between Existing and Future?
  - ✓ Did Homes Exist Before Current Roadway?
  - ✓ Proposed New Roadway on New Alignment?
  - ✓ 8 dBA Noise Reduction Design Goal?
  - Benefited Residents Desire for Noise Wall?

A receptor is benefited if it will experience a 5 dBA or more reduction in 2050 noise level with the addition of the wall.



Potential Noise Wall #1



Potential Noise Wall #1

Bluejay Lane & Landsdown Avenue

- Generally 8 to 10 feet tall
- Approximately 1,285 feet long
- Benefits 13 homes
- Existing noise level 56 to 64 dBA
- 2050 noise level *without wall* 59 to 66 dBA
- Noise impact predicted at 2 of 13 homes
- Change from Existing to 2050 is +2 to +4 dBA
- 2050 noise level *with wall* 54 to 61 dBA
- 2050 noise level reduction of 5 to 10 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

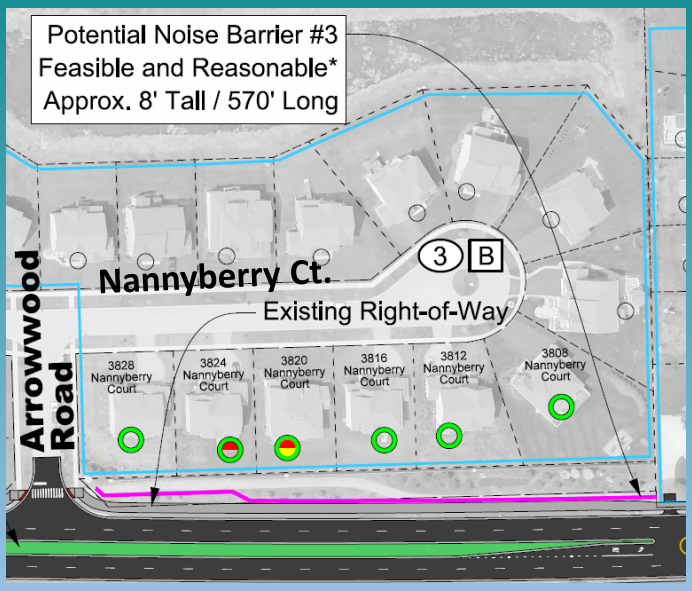
Receptors Benefited By Barrier #1

Approximate Wall Dimensions: 9' Tall, 1,285' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
3920 Bluejay Lane	62	-	64	2	No	57	7
3924 Bluejay Lane	63	-	65	2	No	55	10
3932 Bluejay Lane	64	-	**66**	2	**Yes**	56	10
3936 Bluejay Lane	62	-	64	2	No	55	9
3940 Bluejay Lane	63	-	65	2	No	56	9
3944 Bluejay Lane	62	-	64	2	No	55	9
3948 Bluejay Lane	61	-	63	2	No	55	8
3952 Bluejay Lane	60	-	63	3	No	55	8
3956 Bluejay Lane	61	-	65	4	No	56	9
3960 Bluejay Lane	58	-	60	2	No	55	5
3964 Bluejay Lane	56	-	59	3	No	54	5
3968 Bluejay Lane	56	-	59	3	No	54	5
*3920 Landsdown Ave.	62	63	**66**	4	**Yes**	61	5

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA Noise Abatement Criteria and IDOT policy.
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Potential Noise Wall #3



Potential Noise Wall #3

Nannyberry Court

- Generally 8 feet tall
- Approximately 570 feet long
- Benefits 6 homes
- Existing noise level 58 to 62 dBA
- 2050 noise level *without wall* 62 to 66 dBA
- Noise impact predicted at 2 of 6 homes
- Change from Existing to 2050 is +3 to +4 dBA
- 2050 noise level *with wall* 56 to 60 dBA
- 2050 noise level reduction of 5 to 11 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

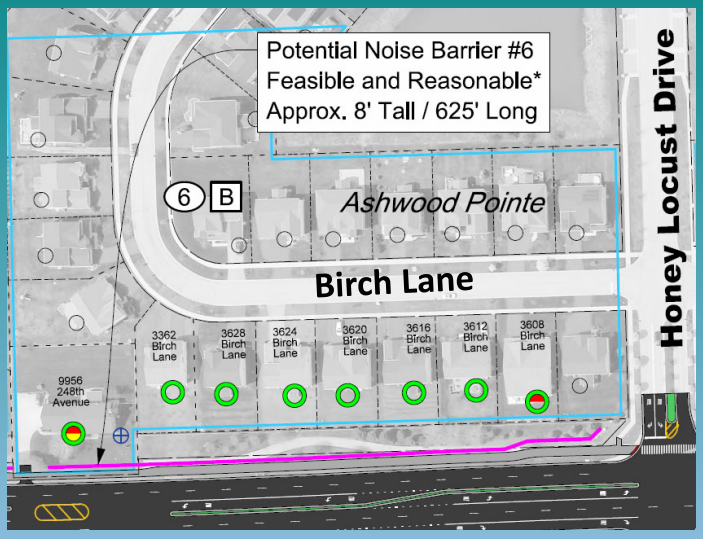
Receptors Benefited By Barrier #3

Approximate Wall Dimensions: 8' Tall, 570' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
3828 Nannyberry Ct.	62	-	65	3	No	60	5
3824 Nannyberry Ct.	62	-	**66**	4	**Yes**	55	11
*3820 Nannyberry Ct.	62	63	**66**	4	**Yes**	55	11
3816 Nannyberry Ct.	61	-	65	4	No	54	11
3812 Nannyberry Ct.	61	-	64	3	No	54	10
3808 Nannyberry Ct.	58	-	62	4	No	54	8

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA Noise Abatement Criteria and IDOT policy.
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Potential Noise Wall #6



Potential Noise Wall #6

Birch Lane (South of Honey Locust) & 248th Avenue

- Generally 8 to 9 feet tall
- Approximately 625 feet long
- Benefits 8 homes
- Existing noise level 52 to 64 dBA
- 2050 noise level *without wall* 57 to 68 dBA
- Noise impact predicted at 2 of 8 homes
- Change from Existing to 2050 is +2 to +5 dBA
- 2050 noise level *with wall* 52 to 62 dBA
- 2050 noise level reduction of 5 to 9 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

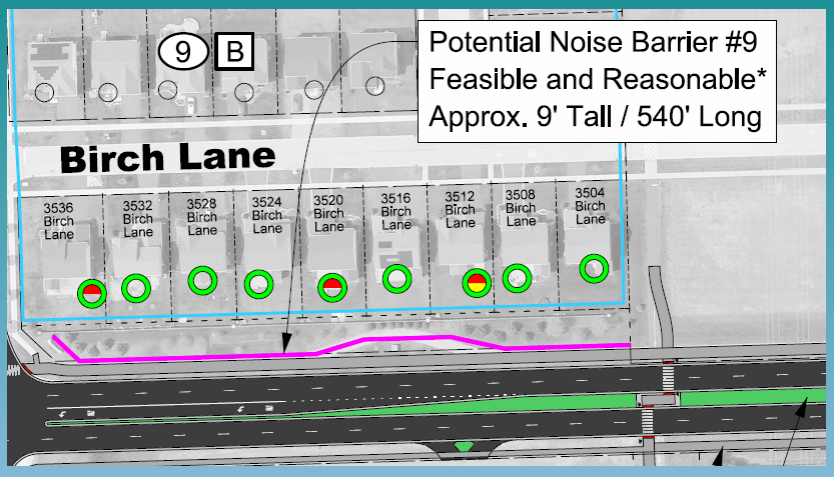
Receptors Benefited By Barrier #6

Approximate Wall Dimensions: 8.5' Tall, 625' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
*9956 248th Avenue	64	65	**68**	4	**Yes**	62	6
3632 Birch Lane	60	-	63	3	No	55	8
3628 Birch Lane	61	-	64	3	No	56	8
3624 Birch Lane	62	-	64	2	No	56	8
3620 Birch Lane	62		65	3	No	56	9
3616 Birch Lane	52		57	5	No	52	5
3612 Birch Lane	62	-	65	3	No	57	8
3608 Birch Lane	63	-	**66**	3	**Yes**	61	5

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA Noise Abatement Criteria and IDOT policy.
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Potential Noise Wall #9



Potential Noise Wall #9

Birch Lane (between Honey Locust and Greenway Trail)

- Generally 8 to 10 feet tall
- Approximately 540 feet long
- Benefits 9 homes
- Existing noise level 60 to 62 dBA
- 2050 noise level *without wall* 64 to 66 dBA
- Noise impact predicted at 2 of 9 homes
- Change from Existing to 2050 is +3 to +5 dBA
- 2050 noise level *with wall* 57 to 60 dBA
- 2050 noise level reduction of 5 to 9 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

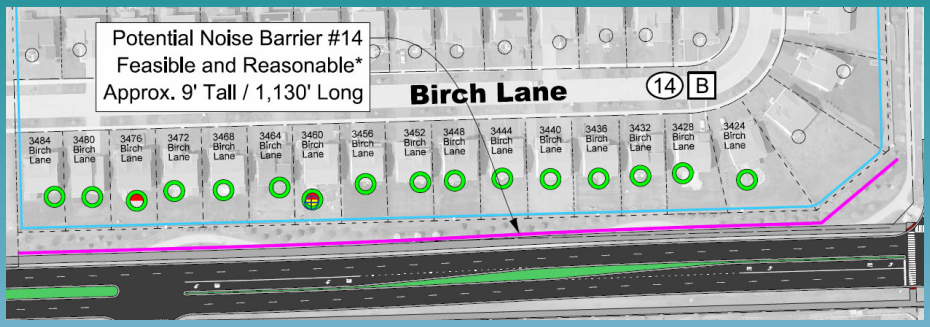
Receptors Benefited By Barrier #9

Approximate Wall Dimensions: 9.5' Tall, 540' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
3536 Birch Lane	62	-	65	3	No	60	5
3532 Birch Lane	62	-	65	3	No	60	5
3528 Birch Lane	61	-	65	4	No	58	7
3524 Birch Lane	62	-	65	3	No	57	8
3520 Birch Lane	62	-	**66**	4	**Yes**	57	9
3516 Birch Lane	61	-	65	4	No	57	8
*3512 Birch Lane	61	62	**66**	5	**Yes**	57	9
3508 Birch Lane	61	-	65	4	No	58	7
3504 Birch Lane	60	-	65	5	No	60	5

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Potential Noise Wall #14



Potential Noise Wall #14

Birch Lane (North of Greenway Trail)

- Generally 8 to 10 feet tall
- Approximately 1,130 feet long
- Benefits 16 homes
- Existing noise level 60 to 61 dBA
- 2050 noise level *without wall* 64 to 66 dBA
- Noise impact predicted at 2 of 16 homes
- Change from Existing to 2050 is +4 to +5 dBA
- 2050 noise level *with wall* 54 to 61 dBA
- 2050 noise level reduction of 5 to 10 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

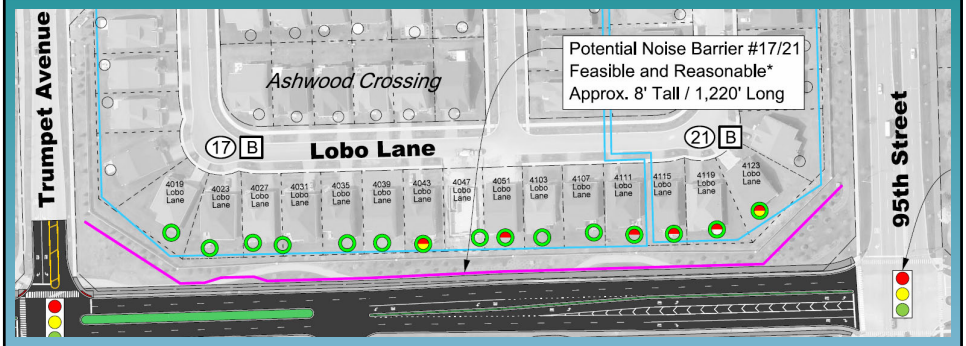
Receptors Benefited By Barrier #14

Approximate Wall Dimensions: 8.5' Tall, 1,130' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
3484 Birch Lane	60	-	65	5	No	60	5
3480 Birch Lane	60	-	65	5	No	58	7
3476 Birch Lane	61	-	**66**	5	**Yes**	57	9
3472 Birch Lane	60	-	65	5	No	57	8
3468 Birch Lane	60	-	65	5	No	56	9
3464 Birch Lane	60	-	65	5	No	56	9
*3460 Birch Lane	61	62	**66**	5	**Yes**	56	10
3456 Birch Lane	60	-	64	4	No	55	9
3452 Birch Lane	60	-	65	5	No	55	10
3448 Birch Lane	60	-	65	5	No	55	10
3444 Birch Lane	60	-	64	4	No	55	9
3440 Birch Lane	61	-	65	4	No	55	10
3436 Birch Lane	61	-	65	4	No	55	10
3432 Birch Lane	61	-	65	4	No	55	10
3428 Birch Lane	61	-	65	4	No	56	9
3424 Birch Lane	60	-	64	4	No	54	10

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA Noise Abatement Criteria and IDOT policy.
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Potential Noise Wall #17/21



Potential Noise Wall #17/21

Lobo Lane

- Generally 8 feet tall
- Approximately 1,220 feet long
- Benefits 15 homes
- Existing noise level 59 to 64 dBA
- 2050 noise level *without wall* 62 to 66 dBA
- Noise impact predicted at 6 of 15 homes
- Change from Existing to 2050 is +2 to +4 dBA
- 2050 noise level *with wall* 54 to 60 dBA
- 2050 noise level reduction of 6 to 10 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

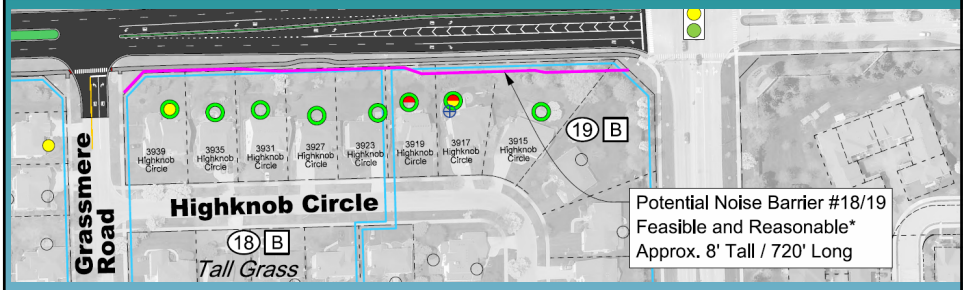
Receptors Benefited By Barrier #17/21

Approximate Wall Dimensions: 8' Tall, 1,220' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
4019 Lobo Lane	59	-	62	3	No	54	8
4023 Lobo Lane	62	-	65	3	No	56	9
4027 Lobo Lane	61	-	65	4	No	55	10
4031 Lobo Lane	62	-	65	3	No	56	9
4035 Lobo Lane	62	-	65	3	No	56	9
4039 Lobo Lane	62	-	65	3	No	57	8
*4043 Lobo Lane	62	63	**66**	4	**Yes**	57	9
4147 Lobo Lane	62	-	65	3	No	57	8
4151 Lobo Lane	62	-	65	3	No	57	8
4103 Lobo Lane	62	-	**66**	4	**Yes**	56	10
4107 Lobo Lane	62	-	65	3	No	56	9
4111 Lobo Lane	62	-	**66**	4	**Yes**	56	10
4115 Lobo Lane	62	-	**66**	4	**Yes**	56	10
4119 Lobo Lane	62	-	**66**	4	**Yes**	56	10
*4123 Lobo Lane	64	65	**66**	2	**Yes**	60	6

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA Noise Abatement Criteria and IDOT policy.
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Potential Noise Wall #18/19



Potential Noise Wall #18/19

Highknob Circle

- Generally 8 to 9 feet tall
- Approximately 720 feet long
- Benefits 8 homes
- Existing noise level 63 to 64 dBA
- 2050 noise level *without wall* 64 to 66 dBA
- Noise impact predicted at 2 of 8 homes
- Change from Existing to 2050 is +1 to +2 dBA
- 2050 noise level *with wall* 57 to 60 dBA
- 2050 noise level reduction of 6 to 8 dBA as a result of wall construction

248th Avenue Phase I Study

NOISE ANALYSIS RESULTS

Receptors Benefited By Barrier #18/19

Approximate Wall Dimensions: 8.5' Tall, 720' Long

Address	Modeled Existing Conditions Noise Level	Predicted 2050 No-Action Noise Level	Predicted 2050 Proposed Action Noise Level (Without Wall)	Predicted Increase in Noise Level by 2050 (Without Wall)	Receptor Impacted?	Predicted 2050 Proposed Action Noise Level With Wall	Predicted 2050 Noise Level Reduction With Wall
*3939 Highknob Circle	64	65	65	1	No	58	7
3935 Highknob Circle	64	-	65	1	No	58	7
3931 Highknob Circle	64	-	65	1	No	57	8
3927 Highknob Circle	63	-	64	1	No	57	7
3923 Highknob Circle	63	-	65	2	No	58	7
3919 Highknob Circle	64	-	65	1	No	57	8
*3917 Highknob Circle	64	65	**66**	2	**Yes**	59	7
3915 Highknob Circle	64	-	**66**	2	**Yes**	60	6

1) * Indicates that this receptor is the Representative Receptor for the Common Noise Environment.
2) **Bold/Underline** indicates that the receptor is predicted to experience a noise impact under 2050 Proposed Action conditions based on the FHWA Noise Abatement Criteria and IDOT policy.
3) The noise levels in this chart represent Leq(h) values of exterior traffic noise, rounded to the nearest decibel (dBA).

Noise Wall Visualization – *No Wall*

Noise Wall Visualization – *With Wall*

Noise Wall Visualization – *With Wall*

Viewpoints Consideration Process

- Goal is a minimum of 1/3 of benefited residents responding.
- Wall will be included if more than 50% in favor.
- You may mail, hand-deliver, or e-mail your viewpoint form to:

Mr. Raymund F. Fano
Project Engineer
Transportation, Engineering and Development Business Group
City of Naperville
400 S. Eagle Street
Naperville, IL 60540
fanor@naperville.il.us

- Forms must be received by 5:00 P.M. **September 23, 2022**

Next Steps

- Finalize Noise Wall Recommendations Based on Viewpoints
- Complete Highway Noise Analysis Report
- Finalize Section 4(f) *de minimis* Documentation
- Finalize Project Development Report
- Receive Phase I Design Approval

Project Moves into Design Engineering Phase

General Questions?