

IV. DECISION REGARDING NEED FOR ENVIRONMENTAL IMPACT STATEMENT

A. Type, Extent, and Reversibility of Impacts

Traffic Noise Analysis

Traffic Noise Analysis Summary

Construction of the Interstate 123 (I-123) Expansion Project would result in small increases in future (year 2037) traffic noise levels compared to existing (year 2017) traffic noise levels. Increases from existing traffic noise levels to future traffic noise levels under the Build Alternative are projected to range from 0.7 dBA to 1.4 dBA (L_{eq}). The future modeled traffic noise levels along the project corridor are predicted to range from 59.8 dBA to 77.7 dBA (L_{eq}) under the Build Alternative. In general, future traffic noise levels at most residential locations along the project corridor are projected to approach or exceed FHWA noise abatement criteria with the proposed I-123 Expansion Project. Future modeled noise levels at residences located adjacent to existing earthen berms are projected to be within FHWA noise abatement criteria under the Build Alternative. Future modeled noise levels at commercial locations along the project corridor are projected to approach or exceed FHWA noise abatement criteria under the Build Alternative.

Consideration of Noise Barriers

Noise barriers were analyzed at locations along the I-123 Expansion Project corridor where modeled noise levels are projected to approach or exceed FHWA noise abatement criteria, or result in a substantial increase in noise levels (i.e., traffic noise level increase ≥ 5 dBA from existing levels to future levels under the Build Alternative). Noise barrier construction decisions are based on a study of feasibility and reasonableness. Noise barrier feasibility and reasonableness are described below.

Noise Barrier Feasibility

Noise barrier feasibility is determined based on a consideration of two factors: 1) acoustic feasibility and 2) engineering feasibility.

- **Acoustic feasibility:** For a noise barrier to be considered acoustically effective, it must achieve a noise reduction of at least 5 dBA at the impacted receptors for those receptors to be considered benefited by a noise barrier. Not every impacted receptor must receive this minimum 5 dBA reduction; however, at least one impacted receptor must meet the minimum 5 dBA reduction for a noise barrier to achieve acoustic feasibility.

- **Engineering feasibility:** Engineering feasibility addresses whether or not it is possible to design and construct a proposed noise abatement measure. A sample of potential constructability considerations includes safety, topography, drainage, utilities, and maintenance considerations. Engineering considerations are also taken into consideration in determining noise barrier height. MnDOT has established a maximum noise barrier height of 20 feet above the finished ground line at the noise barrier. In addition, MnDOT has established a maximum noise barrier height of 10 feet above the bridge deck when it is necessary for a noise barrier to be attached to a bridge structure.

Noise Barrier Reasonableness

Noise barrier reasonableness decisions are based on a consideration of three reasonableness factors: 1) noise reduction design goal, 2) cost effectiveness, and 3) the viewpoint of benefited residents and property owners.

- **Noise reduction design goal:** A minimum 7 dBA reduction must be achieved for at least one benefited receptor behind the noise barrier to meet noise reduction design goals.
- **Cost effectiveness:** To be considered cost-effective, the cost per individual benefited receptor (i.e., residence, commercial entity, industrial entity) should be equal to, or less than \$78,500. In order to assess cost effectiveness, at least one benefited receptor behind the noise barrier must meet the noise reduction design goal described above. The following formula can be used to determine the cost-effectiveness of the barrier:

The cost-effectiveness index is equal to the cost of the noise barrier¹ divided by the number of individual benefited receptors (i.e., residences, commercial entities, industrial entities) that are predicted to experience noise level reductions of 5 dBA or more. Only those receptors that experience a 5 dBA or greater decibel decrease are considered in this formula. The result is a cost per benefited receptor value (residence, commercial entity, or industrial entity represented by each modeled receptor). To be considered cost-effective, the cost per individual benefited receptor must be equal to or less than \$78,500 per receptor.

¹The cost of a noise barrier is calculated using \$36 per square foot of barrier, based historical data from MnDOT projects as well as using national pricing data and using an acoustical absorbent concrete post/concrete panel type wall (MnDOT's standard wall design).

There are several steps to assessing the cost-effectiveness of noise barriers. First, the cost-effective noise barrier height is determined for each segment of the project area, beginning with the evaluation of a 20-foot tall noise barrier (MnDOT's maximum height; see discussion of engineering feasibility above). If a 20-foot tall noise barrier achieves the noise reduction design goal, meets the cost-effectiveness criteria and is feasible, it would be proposed for construction. If the 20-foot tall barrier does not meet the noise reduction design goal or cost-effectiveness criteria, then noise barrier heights less than 20 feet are studied. If a noise barrier

height less than 20 feet achieves the noise reduction design goal, meets the cost-effectiveness criteria and is feasible, it would then be proposed for construction.

- **Viewpoint of Benefited Residents and Owners.** The third criterion in determining noise barrier reasonableness is the viewpoint of benefited residents and property owners. A benefited property is defined as a receptor adjacent to a proposed noise abatement measure that receives a noise reduction equal to or greater than 5 dBA. If benefited residents and property owners indicate that a proposed noise barrier is not desired, then the noise barrier is removed from further consideration and would not be constructed with the project.

There are two steps in determining the desires of the benefited property owners and residents regarding the construction of a proposed noise abatement measures. First, the viewpoint of benefited property owners and residents is solicited through a public involvement process, such as open house meetings, a project website, and direct mailing of a solicitation form. Second, the input received from benefited property owners and residents through this public involvement process is expressed in a vote that is weighted as follows:

The owner of a benefited property immediately adjacent to the highway right of way for the proposed project (i.e., first-row properties) receives 4 points and the resident (owner or renter) receives 2 points. The owner/resident of a benefited property receives a total of all 6 points.

The owner of a benefited property not immediately adjacent to the highway right of way for the proposed project (e.g., second-row properties, third-row properties) receives 2 points and the resident (owner or renter) receives 1 point. The owner/resident of a benefited property receives a total of all 3 points.

When there is no outdoor area of frequent human use associated with a benefited property, the owner of the benefited property receives a total of all 6 points if the property is located immediately adjacent to the highway right of way (i.e., first-row properties). If the property is not immediately adjacent to the highway right of way (i.e., second-row properties, third-row properties), the owner of the benefited property receives a total of all 3 points.

Only those benefited property owners and residents, including individual units of multi-family residential buildings that are considered to be benefited receptors, regardless of floor location (e.g., first floor, second floor, etc.), have a vote according to the point system described above. Non-benefiting receptors do not receive points. If 50% or greater of all possible voting points from benefited receptors for a barrier are received on the first solicitation (typically by mail and/or ballot received at a public meeting), then a simple majority of voting points cast will be used to determine if the proposed barrier will be constructed or not. If less than 50% of all possible points for a barrier are received on the first solicitation, a second solicitation (typically by mail) will be sent to benefited receptors who did not respond to the first solicitation. If after

the second solicitation 25% or greater of all possible points for a barrier are received, a simple majority of voting points cast will be used to determine whether the barrier will be constructed or not. However, if fewer than 25% of total possible points for a noise barrier are received after the second solicitation, then the barrier will not be constructed. In the case of a tie (equal number of points for and against a barrier) the barrier will be constructed.

Noise Barrier Cost Effectiveness Results

Three 20-foot high noise barriers were determined to be feasible based on preliminary design studies, meet MnDOT's design reduction goal of at least 7 dBA at one benefited receptor behind each noise barrier; and meet MnDOT's cost effectiveness criteria of \$78,500/benefited receptor. Noise barrier cost effectiveness results are described in detail in the traffic noise analysis report in Appendix A of the EA/EAW. The locations of the three proposed noise barriers are identified below.

- Barrier C-1: northwest quadrant of the Basswood Parkway interchange
- Barrier H-2: east side of I-123 adjacent to the Norway Pine Apartments
- Barrier M-1: west side of I-123 from Green Ash Street to Red Oak Place

Solicitation Results (Benefited Property Owners and Residents)

Solicitation forms were mailed on September 10, 2017 to benefited property owners and residents adjacent to the three proposed noise barriers. Sample solicitation forms for each of the proposed noise barriers are included as Attachment A. A total of 52 solicitation forms were mailed to benefited property owners and residents. A public open house meeting for the proposed project was held on Wednesday, September 29, 2017, at the Nowhere City Hall – Goldenrod Conference Room. The meeting presented the preliminary design information and visualization materials on the proposed noise barriers. In addition, benefited properties could also submit their viewpoint through the project website or by email to the MnDOT project manager. Solicitation forms and comments regarding the proposed noise barriers were received through Tuesday, October 15, 2017.

The results of the public involvement activities to solicit the viewpoints of the benefited residents and property owners for the three proposed noise barriers are described below.

- **Barrier C-1:** Barrier C-1 is located in the northwest quadrant of the I-123/Basswood Parkway interchange. Nineteen (19) benefited receptors (10 first-row residences, including one multi-family residence with 4 residential units and 5 second-row residences) were identified adjacent to Barrier C-1. The total number of possible voting points for Barrier C-1 is 93. Solicitation forms were received from 18 of the 19 benefited properties. A total of 38

voting points were in favor of the proposed noise barrier. A total of 52 voting points were against construction of the proposed noise barrier.

A majority (58%) of voting points casted for benefited properties adjacent to Barrier C-1 indicated a preference of “No” to construction of a noise barrier in the northwest quadrant of the Basswood Parkway interchange.

- **Barrier H-2:** Barrier H-2 is located along the east side of I-123 adjacent to the Norway Pine Apartment complex. Twenty-nine (29) benefited properties (Norway Pine Apartments owner, 24 ground-floor apartment units, and 4 first-row residences) were identified adjacent to Barrier H-2. The total number of possible voting points for Barrier H-2 is 168. Solicitation forms were received from 23 of the 29 benefited properties. A total of 132 voting points were in favor of the proposed noise barrier. A total of 24 voting points were against construction of the proposed noise barrier.

A majority (85%) of voting points casted for benefited properties adjacent to Barrier H-2 indicated a preference of “Yes” to construction of a noise barrier along the east side of I-123 adjacent to the Norway Pine Apartments.

- **Barrier M-1:** Barrier M-1 is located along the west side of I-123 north of Green Oak Street. Fourteen (14) first-row benefited properties were identified adjacent to Barrier M-1. These benefited properties are represented by a home owners association; however, there is no area of common land ownership. The total number of possible voting points for Barrier M-1 is 84. Solicitation forms were received from all 14 of the benefited properties. A total of 60 voting points were in favor of the proposed noise barrier. A total of 24 voting points were against construction of the proposed noise barrier.

A majority (71%) of voting points casted for benefited properties adjacent to Barrier M-1 indicated a preference of “Yes” to construction of a noise barrier along the west side of I-123 from the southbound I-123 bridge over Green Oak Street to Red Oak Place.

Conclusions and Recommendations

Proposed Noise Barriers

Based on the traffic noise studies completed to date, MnDOT intends to construct highway traffic noise abatement measures in the form of an approximately 20-foot high barrier at two locations along the project corridor. These two noise barriers are feasible, meet MnDOT’s design reduction goal of at least 7 dBA and cost-effectiveness criteria of \$78,500/benefited receptor, and are supported by adjacent benefited receptors.

- Barrier H-2 (east side of I-123 adjacent to the Norway Pine Apartments). This proposed barrier is approximately 1,270 feet long, and runs from a point located approximately 1,100 feet north of the Loon Creek crossing of I-123 to a point located approximately 1,900 feet south of Ironwood Road.

- Barrier M-1 (west side of I-123 from Green Ash Street to Red Oak Place). This proposed barrier is approximately 1,025 feet long and runs from the north end of the southbound I-123 bridge over Green Oak Street to Red Oak Place.

An approximately 20-foot high, 1,255-foot long noise barrier in the northwest quadrant of the Basswood Parkway interchange is feasible, meets MnDOT's noise reduction design goal of at least 7 dBA at one or more benefited receptor, and meets MnDOT's cost-effectiveness criteria of \$78,500/benefited receptor. A solicitation form was distributed to all adjacent benefited property owners and residents adjacent to this barrier to solicit their viewpoint, and voting points were tabulated. A majority of the total possible points (58%) responded "no" to this noise barrier. Therefore, the noise abatement measure in the northwest quadrant of the I-123/Basswood Parkway interchange (Barrier C-1) will be eliminated from the project.

Statement of Likelihood

These preliminary indications of likely abatement measures described above are based upon preliminary design. Final mitigation decisions will be subject to final design considerations. If it subsequently develops during final design that conditions have substantially changed, noise abatement measures may not be provided. Decisions to eliminate or substantially modify a noise abatement measure must be approved by MnDOT and the FHWA Minnesota Division Office. Affected benefited receptors and local officials will be notified of plans to eliminate or substantially modify a noise abatement measure prior to the completion of the final design process. This notification will explain changes in site conditions (if any), additional site information, any design changes implemented during the final design process, and an explanation of noise barrier feasibility and reasonableness.

**TABLE 2
VIEWPOINTS OF BENEFITED RESIDENTS AND OWNERS VOTING POINT
RESULTS**

Barrier (Location)	Total # of Benefited Receptors	Total Possible Points ⁽¹⁾	Points For (Percent)	Points Against (Percent)	Points not returned (percent)	50% of Received Points	Does Barrier Get Constructed? (Yes/No)
Barrier C-1 (northwest quadrant of Basswood Pkwy Interchange) ⁽²⁾	19	93	38 (42%)	52 (58%)	0 (58%)	45	No
Barrier H-2 (east side of I-123 adjacent to Norway Pine Apartments) ⁽³⁾	29	168	132 (85%)	24 (15%)	0 (58%)	78	Yes
Barrier M-1 (west side of I-123 from Green Ash Street to Red Oak Place)	14	84	60 (71%)	24 (29%)	0 (58%)	42	Yes

⁽¹⁾ Total possible points based on number of benefited receptors (property owners, residents or owner/residents) adjacent to the proposed noise barrier (noise reduction at or above MnDOT's minimum threshold of 5 dBA. See Attachment B for detailed voting point worksheets.

⁽²⁾ The resident/owner of one benefited receptor adjacent to Barrier C-1 did not return the solicitation form.

⁽³⁾ The residents of six benefited apartment units adjacent to Barrier H-2 did not return the solicitation form.

ATTACHMENT A

**TRAFFIC NOISE ANALYSIS
PUBLIC INVOLVEMENT – SOLICITATION FORMS**

Example

Why you are receiving this information

The Minnesota Department of Transportation (MnDOT) recently conducted a noise study along Interstate 123 in the City of Nowhere from Basswood Parkway to the end of southbound exist ramp and determined a noise wall constructed at northwest quadrant of Basswood Parkway interchange would reduce the traffic noise level at your property, unit or business by at least 5 decibels.

Vote on the proposed noise wall

Property owners and residents who will experience a 5-decibel reduction in noise as a result of a noise wall can vote for or against the proposed noise wall along the Interstate 123 in the City of Nowhere.

Your vote can make a difference

Cast your vote on the noise wall that affects you by completing the enclosed voting ballot and mailing it back by **October 15, 2017**.

Translation Available

Para solicitar esta información en otro idioma, por favor comuníquese con Janet Miller a través del 651-366-4720 o janet.rae.miller@state.mn.us

Si aad u codsato akhbaartan iyadoo afka kale ku qoran, fadlan la soo xiriir Janet Miller oo laga helo khadka 651-366-4720. Ama janet.rae.miller@state.mn.us

Yog xav tau cov xov no yam siv lwm hom lus hu rau Janet Miller ntawm 651-366-4720 los yog janet.rae.miller@state.mn.us

How voting works

You can vote for or against the noise wall that affects your property, unit or business. MnDOT uses a weighted voting system to ensure residents and property owners are given appropriate influence on the outcome of the noise wall. How much you influence the outcome of the noise wall is based on how much your property/unit is affected by the noise wall and whether or not you own the property/unit.

Proximity to Noise Wall	Points Awarded		
	Resident	Owner	Both
Property/unit is immediately adjacent to the noise wall	2	4	6
Property/unit is not immediately adjacent to the noise wall	1	2	3

Only the units in apartments/multi-family residential buildings that receive a 5 decibel reduction of noise get to vote. Businesses, churches and schools receive a vote equal to that of a property owner. The table above is an example of the voting system. Please see MnDOT's Noise Requirements for additional information about the voting process.

If 50 percent or more of all possible voting points from eligible voters are received after the first request for votes, the majority of points (based upon the votes received) determine the outcome of the noise wall. If less than 50 percent of the possible voting points for a wall are received after the first request, a second ballot will be mailed to the eligible voters who did not respond.

If 25 percent or more of all possible points for a wall are received after the second request for votes, then the outcome is determined by the majority of votes received. If less than 25 percent of total possible points for a noise wall are received after the second request for votes, then the wall will NOT be constructed. If there is a tie, where there are equal numbers of points for and against a noise wall, the noise wall WILL be constructed.

Upcoming neighborhood noise wall meetings

When: September 29, 2017 5:00 pm to 6:30 pm

Where: Nowhere City Hall

1858 Lady Slipper Boulevard, Nowhere City Hall, MN 12345

Computer Generated Visualizations

What will the noise wall look like?

The noise wall will be 20 feet tall, built with concrete post and wooden plank. The visuals below are based on the information available August 31, 2017 and should not be interpreted as an exact design of this project.

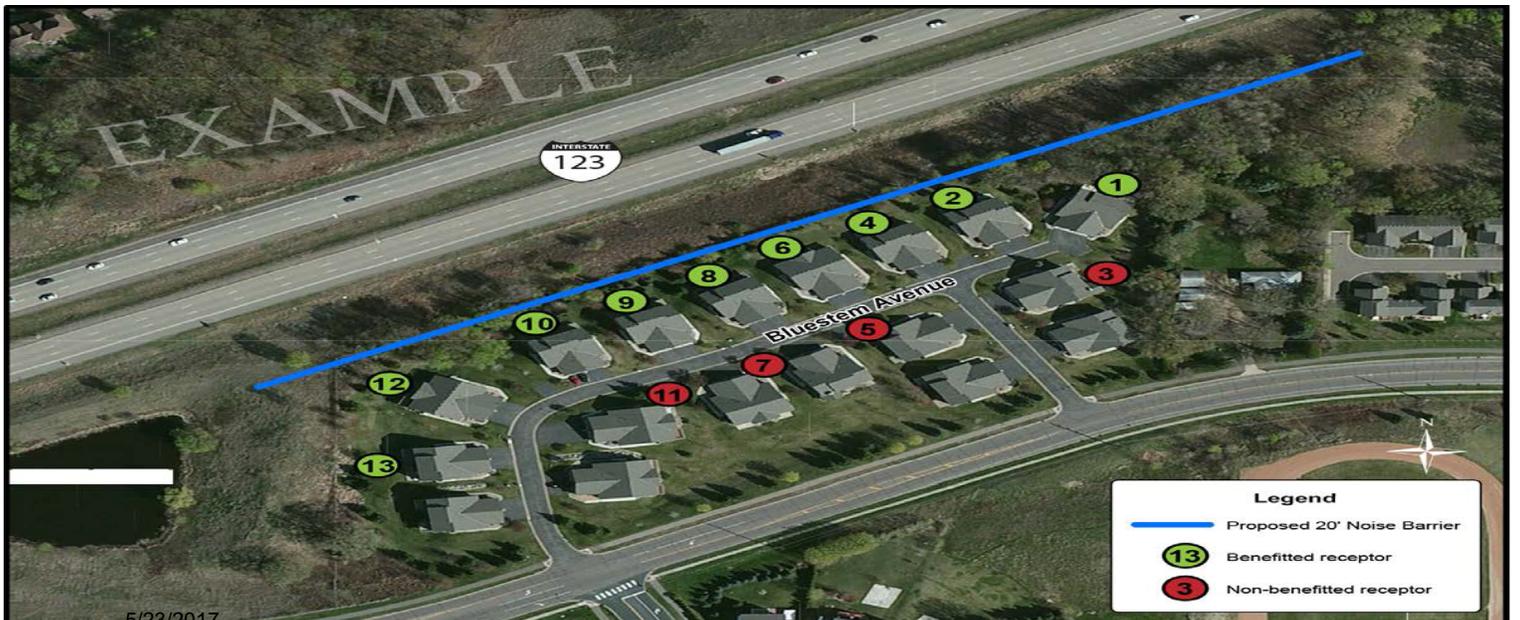
View from Bluestem Avenue looking east



View from 8th Ave. South and I-123 looking southeast

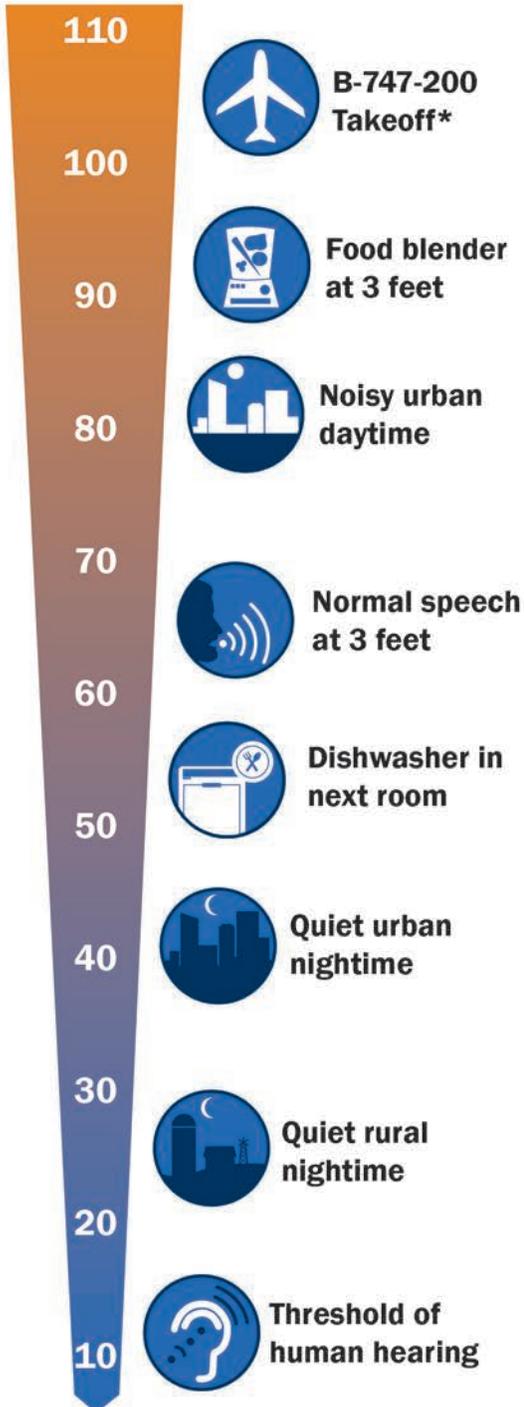


Proposed Noise Barrier



Frequently-Asked Questions

COMPARISON OF NOISE LEVELS Measured in dB(A)



* As measured along the takeoff path 2 miles from the overflight end of the runway

Why are noise walls being proposed as part of the Interstate 123 Expansion Project?

MnDOT conducted a noise study along west side of Interstate 123 in the City of Nowhere to determine if noise walls would reduce the level of noise in the community adjacent to the project. Currently, traffic noise along the west side of Interstate 123 from Basswood Parkway to the end of the southbound exist ramp approaches and/or exceeds the Federal Highway Criteria and a noise wall would reduce the noise levels at certain locations in the community by at least 5 decibels. MnDOT must comply with the noise limit requirements set by the Federal Highway Administration (23 CFR 772).

Studies have shown that changes in noise levels of less than 3 decibels are not typically noticeable by the average human ear. An increase of 5 decibels is generally noticeable by anyone, and a 10-decibel increase is usually “twice as loud.”

Why does MnDOT conduct noise studies?

MnDOT assesses existing noise levels and predicts future noise levels and noise impacts of proposed construction projects. If noise impacts are identified, MnDOT is required to consider noise mitigation measures, such as installing noise walls. All traffic noise studies and analyses must follow the requirements established by federal law, Federal Highway Administration Noise Abatement Criteria, and MnDOT’s Noise Requirements and noise analysis guidelines.

How does MnDOT determine if a noise wall should be proposed?

Constructing a noise wall must be feasible and reasonable. Feasibility and reasonableness are determined by cost, amount of noise reduction, safety and site considerations. Noise mitigation is not automatically provided where noise impacts have been identified. Decisions about noise mitigation are made according to MnDOT’s Noise Requirements.

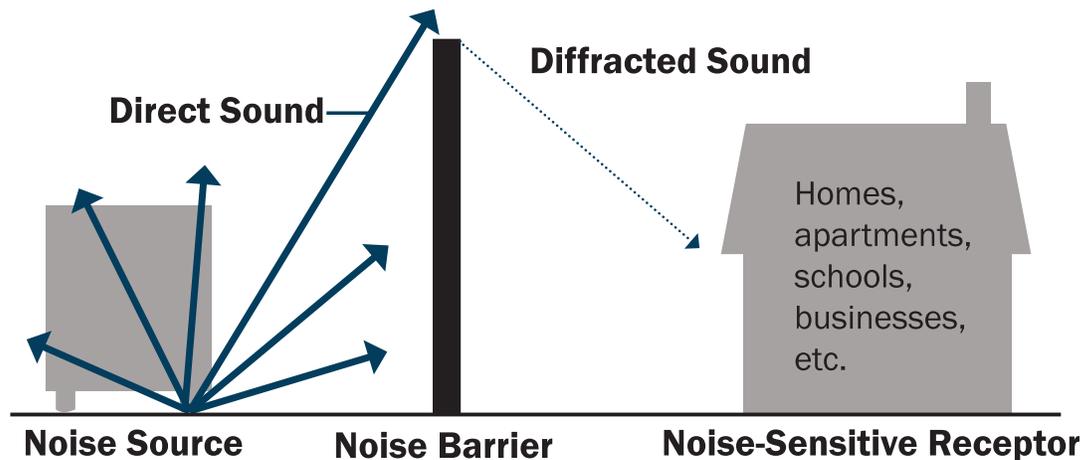
When will the noise wall be installed?

The noise wall would be installed as part of the overall construction project, which is anticipated to begin in April 20, 2019. (tentative schedule - subject to change depending upon funding and project delivery method).

Frequently-Asked Questions

How do noise walls reduce noise?

Noise walls do not eliminate all noise. Noise walls reduce noise by blocking the direct path of sound waves to a home or business. **To be considered effective, a noise wall must reduce noise levels by at least 5 decibels.**



Can noise levels increase as sound waves pass over a noise wall?

No, noise levels do not increase as sound waves pass over a wall. Noise levels are reduced the further the sound waves travel.

Could trees be planted to block traffic noise?

There is not enough space to plant the amount of and size of trees needed to reduce traffic noise. To effectively reduce traffic noise, there needs to be room for at least 100 feet of dense evergreen trees that are 15 feet tall or more. Additionally, if trees are used to reduce traffic noise, they need to be maintained. MnDOT lacks the necessary resources to maintain trees or other vegetation.

How is the location of the noise wall determined?

MnDOT studied various location options to determine the height, length and location which provides the greatest level of noise reduction.

Do noise walls affect property values?

There have not been any studies that link property values to the presence of noise walls.

Where can I find more information about MnDOT's noise requirements?

Visit MnDOT's noise website at <http://www.dot.state.mn.us/environment/noise/index.html>.

Where can I find more information about the <project name>?

Visit MnDOT's project website at <http://www.dot.state.mn.us/i123/>



Proposed Noise Wall – Barrier C-1

Northwest quadrant of the Basswood Parkway Interchange in City of Nowhere

Owner _____ Resident _____ Owner/Resident _____
Name _____
Property Address _____

Please mark one box below with an “X”:

Votes are per unit. By voting and returning this ballot, you acknowledge that the vote represents the consensus of all owners (owner vote) or all residents (resident vote) of the unit receiving this ballot.

Please return ballot **before October 15th, 2017.**

Yes, I want the noise wall

No, I don't want the noise wall