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 2035) traffic noise levels compared to existing (year 2009) traffic noise levels. Increases from existing daytime 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_{10}). The future modeled daytime traffic noise levels along the project corridor are predicted to range from 59.8 dBA to 77.7 dBA (L_{10}) under the Build Alternative. Future nighttime modeled traffic noise levels under the Build Alternative would increase by 0.3 dBA to 1.8 dBA (L_{10}) over existing traffic noise levels. The future modeled nighttime traffic noise levels along the project corridor are predicted to range from 55.9 dBA to 73.9 dBA (L_{10}) under the Build Alternative. In general, future traffic noise levels at most residential locations along the project corridor are projected to exceed State daytime and nighttime standards with the proposed I-123 Expansion Project. Future modeled noise levels at residences located adjacent to existing earthen berms are projected to be within State daytime standards, but generally exceed State nighttime standards under the Build Alternative. Future modeled noise levels at commercial locations along the project corridor are projected to exceed State daytime standards, but be within State nighttime standards 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 exceed State daytime or nighttime noise standards, approach or exceed Federal noise abatement criteria, or result in a substantial increase in noise levels (i.e., traffic noise leve increase $\geq$ 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 $43,500. 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 barrier[1] 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 dB A 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 $43,500 per receptor.

[1]The cost of a noise barrier is calculated using $20 per square foot of barrier, based on historical data over the five year period from 2005-2010.

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 4 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 2 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. A simple majority (greater than 50 percent) of all possible voting points for each of the proposed noise barriers must vote “down” the proposed abatement measure in order for it to be removed from further consideration.

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 $43,500/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, 2010 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, 2010, 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 12, 2010.

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. Voting results for each of the proposed noise barriers are summarized in Table 2. Detailed voting result worksheets for each of the proposed noise barriers are tabulated in Attachment B. Voting results (e.g., "yes" votes and "no" votes) for each of the proposed noise barriers are also illustrated in Attachment B.

- **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, and the simple majority of possible voting points to vote down Barrier C-1 is 47. 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 (56%) of voting points 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, and the simple majority of possible voting points to vote down Barrier H-2 is 85. 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 (79%) of voting points 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, and the simple majority of possible voting points to vote down Barrier M-1 is 43. 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 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 $43,500/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 $43,500/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 (56%) 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)	50% of Total Possible Points	Does Barrier Get Constructed? (Yes/No)
Barrier C-1 (northwest quadrant of Basswood Pkwy Interchange) [2]	19	93	38 (41%)	52 (56%)	47	No
Barrier H-2 (east side of I-123 adjacent to Norway Pine Apartments) [3]	29	168	132 (79%)	24 (14%)	84	Yes
Barrier M-1 (west side of I-123 from Green Ash Street to Red Oak Place)	14	84	60 (71%)	24 (29%)	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-1did 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

ATTACHMENT B

TRAFFIC NOISE ANALYSIS
PUBLIC INVOLVEMENT – SOLICITATION RESULTS

Benefited Receptor Voting Results Worksheet
and Figure

NOISE BARRIER C-1 - PUBLIC INVOLVEMENT WORKSHEET

BENEFITED RECEPTOR VOTING POINT RESULTS

Highway: SB I-123 (west side)

From: Basswood Parkway
To: Point located approximately 250 feet south of exit ramp

Barrier Length: 1,225 feet
Barrier Height: 20 feet

No.	Receptor Address	Benefited Receptor [1]		Location [2]		Owner or Resident				Voting Results			Voting Points		
		Yes	No	1st Row	2nd Row	Owner	Resident	Owner/ Resident	Association	Yes [3]	No [4]	No Response	Available	Yes	No
1	14316 Basswood Parkway		x	x				x		--	--		0	--	--
2	14385 Bluestem Avenue	x			x			x		x			3	3	
3	14375 Bluestem Avenue	x		x				x			x		6		6
4	14365 Bluestem Avenue	x		x				x		x			6	6	
5	14355 Bluestem Avenue	x		x		x					x		16		16
6	14355 Bluestem Avenue,Unit #1	x		x			x			x			2	2	
7	14355 Bluestem Avenue, Unit #2	x		x			x			x			2	2	
8	14355 Bluestem Avenue, Unit #3	x		x			x			x			2	2	
9	14355 Bluestem Avenue, Unit #4	x		x			x			x			2	2	
10	450 Sugar Maple Lane	x		x				x			x		6		6
11	500 Sugar Maple Lane	x		x				x			x		6		6
12	510 Sugar Maple Lane	x		x				x		x			6	6	
13	520 Sugar Maple Lane	x		x				x			x		6		6
14	530 Sugar Maple Lane	x		x				x			x		6		6
15	540 Sugar Maple Lane	x		x				x		x			6	6	
16	550 Sugar Maple Lane	x		x				x		x			6	6	
17	14390 Bluestem Avenue	x			x			x			x		3		3
18	435 Sugar Maple Lane	x			x			x				x	3	NR	NR
19	445 Sugar Maple Lane	x			x			x		x			3	3	
20	455 Sugar Maple Lane	x			x			x			x		3		3
21	505 Sugar Maple Lane		x		x			x		--	--		0	--	--
22	515 Sugar Maple Lane		x		x			x		--	--		0	--	--
23	525 Sugar Maple Lane		x		x			x		--	--		0	--	--
--	Association	--	--	--	--				NA	--	--		NA	--	--
												TOTAL:	**93**	**38**	**52**
												PERCENTAGE:		**41%**	**56%**

Notes:

(1) Receptor location that receives a noise reduction at or above 5 dBA with the noise abatement measure.

(2) 1st row column represents those properties located immediately adjacent to the highway right of way. 2nd row column represents all properties not immediately adjacent to the highway right of way.

(3) Response from letter soliciting benefited receptor viewpoint (i.e., "Yes, I do want the noise barrier")

(4) Response from letter soliciting benefited receptor viewpoint (i.e., "No, I do not want the noise barrier")

NA = Not applicable. There is no homeowners association in conjunction with benefited receptors adjacent to Noise Barrier C-1.

NR = No response. The owner/resident did not return the solicitation form.

14355 Bluestem Ave

ID		Yes	No
5	- Owner -		x
6	- Unit #1 -	x	
7	- Unit #2 -	x	
8	- Unit #3 -	x	
9	- Unit #4 -	x	

(see worksheet for Noise Barrier C-1)

BENEFITED RECEPTORS AND VIEWPOINT OF RESIDENTS AND OWNERS

Solicitation Form Results

- "Yes" I want the noise barrier
- "No" I do not want the noise barrier
- Benefited receptor, no response
- Non-benefited receptor (< 5 dBA reduction)
- 1 Receptor ID (see worksheet)

0 200 400
scale in feet

1 AUXILIARY LANE
3 TRAVEL LANES

3 TRAVEL LANES
1 AUXILIARY LANE

BLUESTEM AVE.
SUGAR MAPLE LN.
BASSWOOD PARKWAY
Noise Barrier C-1
MONARCH LN. N.
JACK PINE TRAIL
SUGAR MAPLE LN.
COUNTY RD. 78
Interstate 123
BRIDGE 27654
BRIDGE 96697
BRIDGE 27679
COTTONWOOD LN. N.
SILVER MAPLE LN. N.
61TH AVE. N.
ORCHID LN. N.

LEGEND

- PAVED ROADWAY
- BRIDGES & RETAINING WALLS
- RAISED MEDIANS & CURBS
- PAVED SHOULDERS
- TRAVEL LANES
- AUXILIARY LANE
- MODELED NOISE BARRIER LOCATION

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Traffic Noise Analysis - Solicitation Results (Noise Barrier C-1)

Interstate 123 Expansion Project (Interstate 456 to Wild Rice Road)
SP 7890-987
MnDOT

Figure 1