I-75 Modernization Project
Construction Segment Three Build Year 2040
Draft Noise Report

Oakland County, Michigan

October 2018

Table of Contents

1.0 Project Study Area And Previous Traffic Noise Analysis Historical Background 1
1.1 Summary of Abatement Analysis Findings Noise Segment 1 3
1.2 Summary of Abatement Analysis Findings Noise Segment 2 5
1.3 Summary of Abatement Analysis Findings Noise Segment 3 7
1.4 Summary of Abatement Analysis Findings Noise Segment 4 9
1.5 Summary of Abatement Analysis Findings Noise Segment 5 SE 11
1.6 Summary of Abatement Analysis Findings Noise Segment 5 NE 13
1.7 Summary of Abatement Analysis Findings Noise Segment 5A 15
1.8 Summary of Abatement Analysis Findings Noise Segment 6 17
1.9 Summary of Abatement Analysis Findings Noise Segment 6A 19
2.0 Fundamental Concepts of Roadway Noise 21
2.1 A-Weighted Sound Level 21
2.2 Noise Level Descriptors 23
2.3 Noise Impact Criteria 23
2.4 Feasibility and Reasonableness 25
2.5 Public Involvement Phase 26
2.6 Third Party Funds 26
3.0 Future 2040 Build Conditions Noise Level Estimates 27
3.1 Noise Segment 1: Noise Impact Analysis Findings 27
3.2 Noise Segment 2: Noise Impact Analysis Findings 35
3.3 Noise Segment 3: Noise Impact Analysis Findings 42
3.4 Noise Segment 4: Noise Impact Analysis Findings 49
3.5 Noise Segment 5 SE: Noise Impact Analysis Findings 55
3.5.1 Noise Segment 5 SE: Lower Segment Noise Impact Findings 55
3.6 Noise Segment 5 NE: Noise Impact Analysis Findings 62
3.6.1 Noise Segment 5 NE: Upper Segment Noise Impact Findings 62
3.7 Noise Segment 5A: Noise Impact Analysis Findings 71
3.8 Noise Segment 6: Noise Impact Analysis Findings 81
3.9 Noise Segment 6A: Noise Impact Analysis Findings 87
4.0 Future 2040 Build Conditions with Abatement 91
4.1 Noise Segment 1: Noise Abatement Findings 91
4.1.1 Statement of Likelihood 94
4.2 Noise Segment 2: Noise Abatement Findings 95

4.2.1 Statement of Likelihood 99
4.3 Noise Segment 3: Noise Abatement Findings 99
4.3.1 Statement of Likelihood 104
4.4 Noise Segment 4: Noise Abatement Findings 105
4.4.1 Statement of Likelihood 109
4.5 Noise Segment 5: Noise Abatement 109
4.6 Noise Segment 5 SE: Noise Abatement Findings 110
4.6.1 Option 4: Full Street Access Community Side Sound Barrier Design 110
4.6.2 Southbound Replacement Sound Barrier 113
4.6.3 Statement of Likelihood 114
4.7 Noise Segment 5 NE: Noise Abatement Findings 115
4.7.1 Option 2: Community Side Sound Barrier Design 115
4.7.2 Statement of Likelihood 119
4.8 Noise Segment 5A: Noise Abatement Findings 120
4.8.1 Statement of Likelihood 124
4.9 Noise Segment 6: Noise Abatement Findings 125
4.9.1 Statement of Likelihood 130
4.10 Noise Segment 6A: Noise Abatement Findings 130
4.10.1 Statement of Likelihood 135
5.0 Conclusion 136
5.1 Noise Segment 1 136
5.2 Noise Segment 2 136
5.3 Noise Segment 3 136
5.4 Noise Segment 4 136
5.5 Noise Segment 5 SE 137
5.6 Noise Segment 5 NE 137
5.7 Noise Segment 5A 137
5.8 Noise Segment 6 138
5.9 Noise Segment 6A 138

List of Appendices

Appendix A Noise Segment 1 Study Area Sound Barrier Station Points 139

Appendix B Noise Segment 2 Study Area Sound Barrier Station Points 144

Appendix C Noise Segment 3 Study Area Sound Barrier Station Points 149

Appendix D Noise Segment 4 Study Area Sound Barrier Station Points 153

Appendix E From I-696 Interchange to Lincoln Avenue Noise Segment 5 SE Study Area Sound Barrier Station Points 157

Appendix F From Lincoln Avenue to 11 Mile Road Noise Segment 5 NE Study Area Sound Barrier Station Points 161

Appendix G Noise Segment 5A Study Area Sound Barrier Station Points 166

Appendix H Noise Segment 6 Study Area Sound Barrier Station Points 171

Appendix I Noise Segment 6A Study Area Sound Barrier Station Points 175

List of Figures

Figure 1 – Construction Segment Three: Noise Segments 1-6a 2
Figure 2 – Noise Segment 1 Study Area Limits 4
Figure 3 – Noise Segment 2 Study Area Limits 6
Figure 4 – Noise Segment 3 Study Area Limits 8
Figure 5 – Noise Segment 4 Study Area Limits 10
Figure 6 – Lower Portion of Noise Segment 5 Study Area Limits 12
Figure 7 – Upper Portion of Noise Segment 5 Study Area Limits. 14
Figure 8 – Noise Segment 5A Study Area Limits 16
Figure 9 – Noise Segment 6 Study Area Limits 18
Figure 10 – Noise Segment 6A Study Area Limits 20
Figure 11 – Typical Noise Levels 22
Figure 12 – Summary of Noise Segment 1 Projected 2040 Build Year Impacted Receivers 34
Figure 13 – Summary of Noise Segment 2 Projected 2040 Build Year Impacted Receivers 41
Figure 14 – Summary of Noise Segment 3 Projected 2040 Build Year Impacted Receivers 48
Figure 15 – Summary of Noise Segment 4 Projected 2040 Build Year Impacted Receivers 54
Figure 16 – Summary of Impacted Receivers Noise Segment 5 SE (Lower Section) 61
Figure 17 – Summary of Impacted Receivers Noise Segment 5 NE (Upper Section) 70
Figure 18 – Summary of Noise Segment 5A Projected 2040 Build Year Impacted Receivers 80
Figure 19 – Summary of Noise Segment 6 Projected 2040 Build Year Impacted Receivers 86
Figure 20 – Summary of Noise Segment 6A Projected 2040 Build Impacted Receivers 90
Figure 21 – Noise Segment 1 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barriers NB1 & NB2 and Southbound Barriers SB1 & SB2 92
Figure 22 – Noise Segment 2 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barriers NB1 & NB2 and Southbound Barriers SB1 & SB2 96
Figure 23 – Noise Segment 3 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barrier NB1 and Southbound Barriers SB1 & SB2 101
Figure 24 – Noise Segment 4 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barrier NB1+NB2 and Southbound Barriers SB1 & SB2 (2A, 2B & 2C) 106
Figure 25 –Noise Segment 5 SE (Lower Section) Option 4 Sound Barrier Design Configuration Benefitting Receptors 112
Figure 26 –Noise Segment 5 NE (Upper Section) Option 2 Sound Barrier Design Configuration Benefitting Receptors 116
Figure 27 – Noise Segment 5A Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barriers NB1 & NB2 and Southbound Barriers SB1 & SB2 121
Figure 28 – Noise Segment 6 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barrier NB1 and Southbound Barriers SB1 & SB2 127
Figure 29 – Summary of Noise Segment 6A Benefitting Receivers for Proposed Northbound Shoulder Sound Barrier Design 132

Figure 30 – Summary of Noise Segment 6A Benefitting Receivers for Proposed Northbound ROW Sound Barrier Design 133

List of Tables

Table 1 – FHWA Noise Abatement Criteria (NAC)[1] Hourly A-Weighted Sound Level in dB(A) 24
Table 2 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barriers NB1 &NB2 28
Table 3 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barriers SB1 & SB2..... 31
Table 4 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barriers NB1 &NB2 36
Table 5 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement1 Adjacent to Southbound Sound Barriers SB1 & SB2..... 39
Table 6 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barrier NB1 43
Table 7 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barrier SB1..... 45
Table 8 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barrier SB2..... 47
Table 9 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barrier NB1+NB2 50
Table 10 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to South-bound Barrier SB1 52
Table 11 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Southbound Barrier SB2 (2A+2B+2C) 53
Table 12 – Summary of Noise Segment 5 SE Predicted Future Build Noise Levels, [1] Impacts & Noise Reduction Achieved Levels for the Community Side Sound Barrier Design..... 56
Table 13 – Summary of Noise Segment 5 SE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB2)..... 59
Table 14 – Summary of Noise Segment 5 NE Predicted Future Build Noise Levels[1], Impacts & Noise Reduction Levels Achieved With Barrier Design Option 2 63
Table 15 – Summary of Noise Segment 5 NE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB1)..... 67
Table 16 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Combined Northbound Replacement Sound Barrier NB1 and NB2..... 72
Table 17 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Proposed Existing Replacement Sound Barrier SB1..... 76

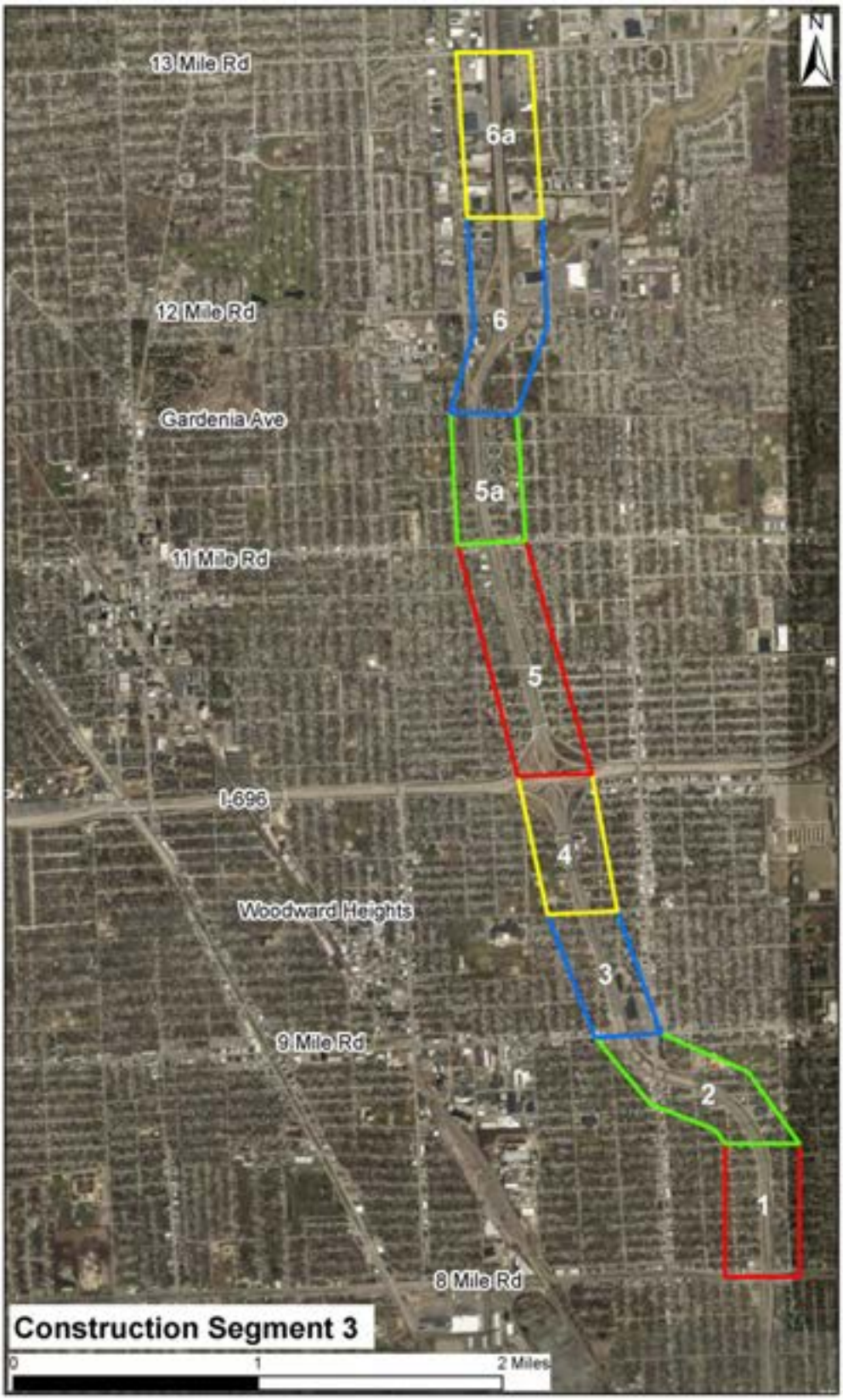
Table 18 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Southbound Replacement Sound Barrier SB2 79
Table 19 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barrier NB1 82
Table 20 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to South-bound Barrier SB1 84
Table 21 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to South-bound Barrier SB2 85
Table 22 – Summary of Noise Segment 6A Shoulder Analysis Predicted Future Build Unabated Noise Levels & Noise Reduction Achieved[1] with Abatement 88
Table 23 – Summary of Noise Segment 6A Right-of-Way Analysis Predicted Future Build Unabated Noise Levels & Noise Reduction Achieved[1] with Abatement 89
Table 24 – Feasibility and Reasonableness Assessment Noise Segment 1 Behind Proposed Northbound Sound Barriers NB1 & NB2 93
Table 25 – Feasibility and Reasonableness Assessment Noise Segment 1 Behind Proposed Southbound Sound Barriers SB1 & SB2 94
Table 26 – Feasibility and Reasonableness Assessment Noise Segment 2 Behind Proposed Northbound Sound Barriers NB1 & NB2 97
Table 27 – Feasibility and Reasonableness Assessment Noise Segment 2 Behind Proposed Southbound Sound Barriers SB1 & SB2 98
Table 28 – Feasibility and Reasonableness Assessment Noise Segment 3 Behind Proposed Northbound Sound Barrier NB1 102
Table 29 – Feasibility and Reasonableness Assessment Noise Segment 3 Behind Proposed Southbound Sound Barrier SB1 103
Table 30 – Feasibility and Reasonableness Assessment Noise Segment 3 Behind Proposed Southbound Sound Barrier SB2 104
Table 31 – Feasibility and Reasonableness Assessment Noise Segment 4 Behind Proposed Northbound Sound Barrier NB1+NB2 107
Table 32 – Feasibility and Reasonableness Assessment Noise Segment 4 Behind Proposed Southbound Sound Barrier SB1 108
Table 33 – Feasibility and Reasonableness Assessment Noise Segment 4 Behind Proposed Southbound Sound Barrier SB2 (2A+2B+2C) 109
Table 34 – Feasibility and Reasonableness Assessment Noise Segment 5 SE Option 4: Full Street Access Community Side Sound Barrier Design 113
Table 35 – Feasibility and Reasonableness Assessment Noise Segment 5 SE Southbound Lower Section Replacement Sound Barrier SB2 114
Table 36 – Feasibility and Reasonableness Assessment Noise Segment 5 NE Northbound Sound Barrier Design Option 2: Community Side Sound Barrier Design 117
Table 37 – Feasibility and Reasonableness Assessment Noise Segment 5 NE Southbound Upper Section Replacement Sound Barrier SB1 119

Table 38 – Feasibility and Reasonableness Assessment Noise Segment 5A Behind Proposed Northbound Replacement Sound Barriers NB1 & NB2 122
Table 39 – Feasibility and Reasonableness Assessment Noise Segment 5A Behind Proposed Southbound Replacement Sound Barrier SB1 123
Table 40 – Feasibility and Reasonableness Assessment Noise Segment 5A Behind Proposed Southbound Replacement Sound Barrier SB2 124
Table 41 – Feasibility and Reasonableness Assessment Noise Segment 6 Behind Proposed Northbound Sound Barrier NB1 128
Table 42 – Feasibility and Reasonableness Assessment Noise Segment 6 Behind Proposed Southbound Sound Barrier SB1 129
Table 43 – Feasibility and Reasonableness Assessment Noise Segment 6 Behind Proposed Southbound Sound Barrier SB2 130
Table 44 – Feasibility and Reasonableness Assessment Noise Segment 6A Behind Proposed Northbound Sound Barrier NB1 (Shoulder) 134
Table 45 – Feasibility and Reasonableness Assessment Noise Segment 6A Behind Proposed Northbound Sound Barrier NB1 (ROW) 135

1.0 PROJECT STUDY AREA AND PREVIOUS TRAFFIC NOISE ANALYSIS HISTORICAL BACKGROUND

The proposed I-75 roadway improvement project, identified as the I-75 Modernization Project, is in Oakland County, Michigan. The proposed roadway improvements cover a 17-mile portion of I-75 from north of 8 Mile Road to north of South Boulevard. This noise study represents a re-evaluation of the proposed reconstruction of the I-75 corridor that was completed in January 2005 and at that time, many sound barriers were recommended and were part of the project Record of Decision (ROD). The updated traffic noise study report includes additional proposed roadway improvements not in the 2005 study and forecasts noise levels for future 2040 Build Year peak hour traffic conditions. Furthermore, the present study maintains the previous analysis format of delineating the I-75 Modernization Project into defined noise study area segments consisting of the 12 original 2005 noise segments plus two additional noise segments covering from Squirrel Road to the Clinton River Trail. Therefore, the noise analysis was conducted for the entire 14 noise segments. The entire length of the I-75 Modernization Project roadway improvements is organized into three construction segmgents. Construction Segment One extends from north of Coolidge Highway to north of South Boulevard; Construction Segment Two extends from north of 13 Mile Road to north of Coolidge Highway; and Construction Segment Three extends from north of 8 Mile Road to north of 13 Mile Road. This traffic noise study report focuses solely on the Construction Segment 3 study area as illustrated in Figure 1, which includes Noise Segments 1 through 6a.

Figure 1 – Construction Segment Three: Noise Segments 1-6a



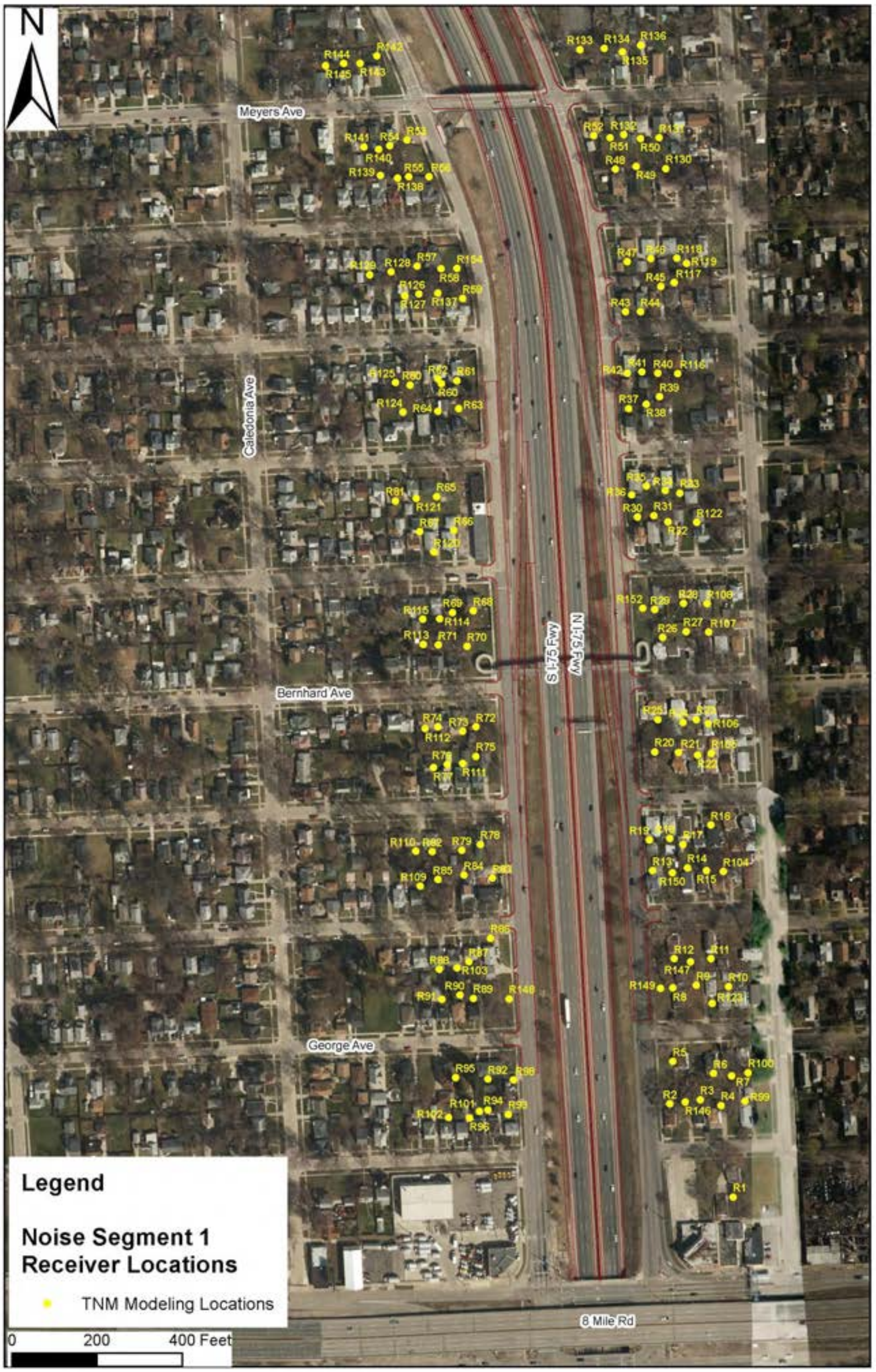
In December 2010, revisions to the Federal Highway Administration (FHWA) traffic noise regulations defined in 23 CFR 772, were formulated and became effective nationally in July 2011. In Michigan, the traffic noise impact and abatement process procedures and requirements are contained in the Michigan Department of Transportation (MDOT) Highway Noise Analysis and Abatement Handbook (dated July 2011). Therefore, this noise study was completed to confirm the abatement measures recommended in the January 2005 ROD are maintained based on the 23 CFR 772 revisions as defined in MDOT noise abatement policy requirements. The most noteworthy changes in 23 CFR 772 included expanding the Noise Abatement Criteria (NAC) from five to seven land use categories, how dwelling unit equivalents (DUE) are calculated, and how "feasibility and reasonableness" are determined. Furthermore, this updated analysis used the mandated and latest version of the FHWA Traffic Noise Model (TNM), Version 2.5, rather than Version 2.1 which was used during the 2005 traffic noise study. This newer version has been widely vetted and found to be more accurate than the earlier versions. In addition, the new noise analysis includes the latest changes to the proposed highway design improvements. The horizontal and vertical design of the proposed roadway improvements have changed since the completion of the 2005 FEIS. Along with the geometric improvements, future traffic volume projections have increased; free flowing travel speeds and speed limits are generally projected higher throughout the corridor resulting in a higher future predicted ambient noise environment. Previously recommended sound barriers are maintained in the new impact and abatement analysis and in many cases the 2005 recommended barriers are extended to provide greater noise reduction to adjacent properties not impacted in the 2005 study. However, in all cases the 2005 recommended sound barriers are optimized to provide the best possible noise abatement under the new proposed highway design. This noise analysis focused on updating the traffic noise impacts and abatement results based on the 2040 Build Year traffic projections and the latest proposed roadway improvements.

1.1 Summary of Abatement Analysis Findings Noise Segment 1

A noise analysis was completed for Noise Segment 1 from 8 Mile Road to Myers Avenue using 2040 Build Year traffic projections to determine noise impacts and abatement measures at noise sensitive properties adjacent to the southbound and northbound lanes along I-75. In the 2005 traffic noise study, both Northbound Sound Barriers NB1 and NB2 along with the Southbound Sound Barrier SB1 locations were approved in the 2005 Record of Decision (ROD).

The present 2040 traffic noise study, improves upon that previous analysis with the identification of a second Southbound Sound Barrier, SB2, which provides abatement in conjunction with southbound SB1 to a larger portion of the adjacent residential community. In the northbound direction Sound Barrier NB1 was extended further south towards 8 Mile Road. Therefore, within Noise Segment 1, Northbound Sound Barriers NB1 & NB2 and Southbound Sound Barriers SB1 & SB2 are recommended and will move to final design. Figure 2 provides the receiver locations and the study limits for Noise Segment 1.

Figure 2 – Noise Segment 1 Study Area Limits



1.2 Summary of Abatement Analysis Findings Noise Segment 2

A noise analysis was completed for Noise Segment 2 from Myers Avenue to 9 Mile Road using 2040 Build Year traffic projections to determine noise impacts and abatement measures at noise sensitive properties adjacent to the southbound and northbound lanes along I-75. In the 2005 traffic noise ROD, the two northbound sound barriers were found both feasible and reasonable and are recommended for construction. In addition, the present study identified and evaluated two additional new proposed southbound sound barriers. However, the two-proposed southbound sound barriers failed to achieve adequate noise reduction at a reasonable cost and should be removed from further consideration. Therefore, within Noise Segment 2, Northbound Sound Barriers NB1 and NB2 are recommended and will move to final design. Figure 3 provides the receiver locations and the study limits for Noise Segment 2.

Figure 3 – Noise Segment 2 Study Area Limits

1.3 Summary of Abatement Analysis Findings Noise Segment 3

A noise analysis was completed for Noise Segment 3 from 9 Mile Road to Woodward Heights Boulevard using 2040 Build Year traffic projections to determine noise impacts and abatement measures at noise sensitive properties adjacent to the southbound and northbound lanes adjacent to I-75. Three sound barriers were identified and evaluated within Noise Segment 3, one proposed sound barrier in the northbound direction and two sound barriers in the southbound direction. As part of the 2005 ROD, Southbound Sound Barrier SB1 was previously recommended for construction and will be considered in final design along with the new proposed Northbound Sound Barrier NB1 which satisfies MDOT 2011 feasibility and reasonableness requirements. The third sound barrier within Noise Segment 3, identified as Southbound Sound Barrier SB2, did not satisfy the MDOT policy requirements for reasonableness. Therefore, within Noise Segment 3, Northbound Sound Barrier NB1 and Southbound Sound Barrier SB1 are recommended and will move to final design. Figure 4 provides the receiver locations and the study limits for Noise Segment 3.

Figure 4 – Noise Segment 3 Study Area Limits

1.4 Summary of Abatement Analysis Findings Noise Segment 4

A noise analysis was completed for Noise Segment 4 from Woodward Heights Boulevard to just south of the I-696 interchange using 2040 Build Year traffic projections to determine noise impacts and abatement measures at noise sensitive properties adjacent to the southbound and northbound lanes along I-75. In Noise Segment 4, one northbound sound barrier was approved as part of the 2005 (ROD), identified as Northbound Sound Barrier NB1 and was optimized in the present study for cost and acoustic effectiveness. The northbound sound barrier under the present design consists of two barrier segments that are treated as one sound barrier. The two sound barriers are identified as 4NB1 and 4NB2.

In the southbound direction, two new sound barrier locations were identified and evaluated for cost and acoustic effectiveness. The Southbound Sound Barrier SB1 did not satisfy the abatement requirements whereas proposed Southbound Sound Barrier SB2, consisting of three smaller walls identified as SB2A, SB2B and SB2C, do satisfy the feasibility and reasonableness requirements.

Therefore, within Noise Segment 4, Northbound Sound Barrier NB1 and Southbound Sound Barrier SB2 are recommended and will move to final design. Figure 5 provides the receiver locations and the study limits for Noise Segment 4.

Figure 5 – Noise Segment 4 Study Area Limits

1.5 Summary of Abatement Analysis Findings Noise Segment 5 SE

A noise analysis was completed for Noise Segment 5 SE from just north of the I-696 interchange to Lincoln Avenue using 2040 Build Year peak hour PM traffic projections to determine the extent of noise impacts and the acoustical effectiveness of existing sound barriers at sensitive properties adjacent to I-75. As part of the 2005 ROD findings, recommendations for sound barriers were provided for adjacent properties in the northbound direction. The present study has developed a sound barrier design that addresses those northbound abatement commitments. Furthermore, the present study includes a potential southbound replacement wall. The noise abatement analysis findings found that the proposed southbound replacement sound barrier did not satisfy any of MDOT's feasibility and reasonableness requirements and thus is not recommended. As a result of the abatement analysis findings, the existing southbound wall will remain unaltered. Therefore, within Noise Segment 5 SE study area, all proposed northbound sound barriers are recommended and will move to final design. Figure 6 provides the receiver locations and the study limits for Noise Segment 5 SE.

Figure 6 – Lower Portion of Noise Segment 5 Study Area Limits

1.6 Summary of Abatement Analysis Findings Noise Segment 5 NE

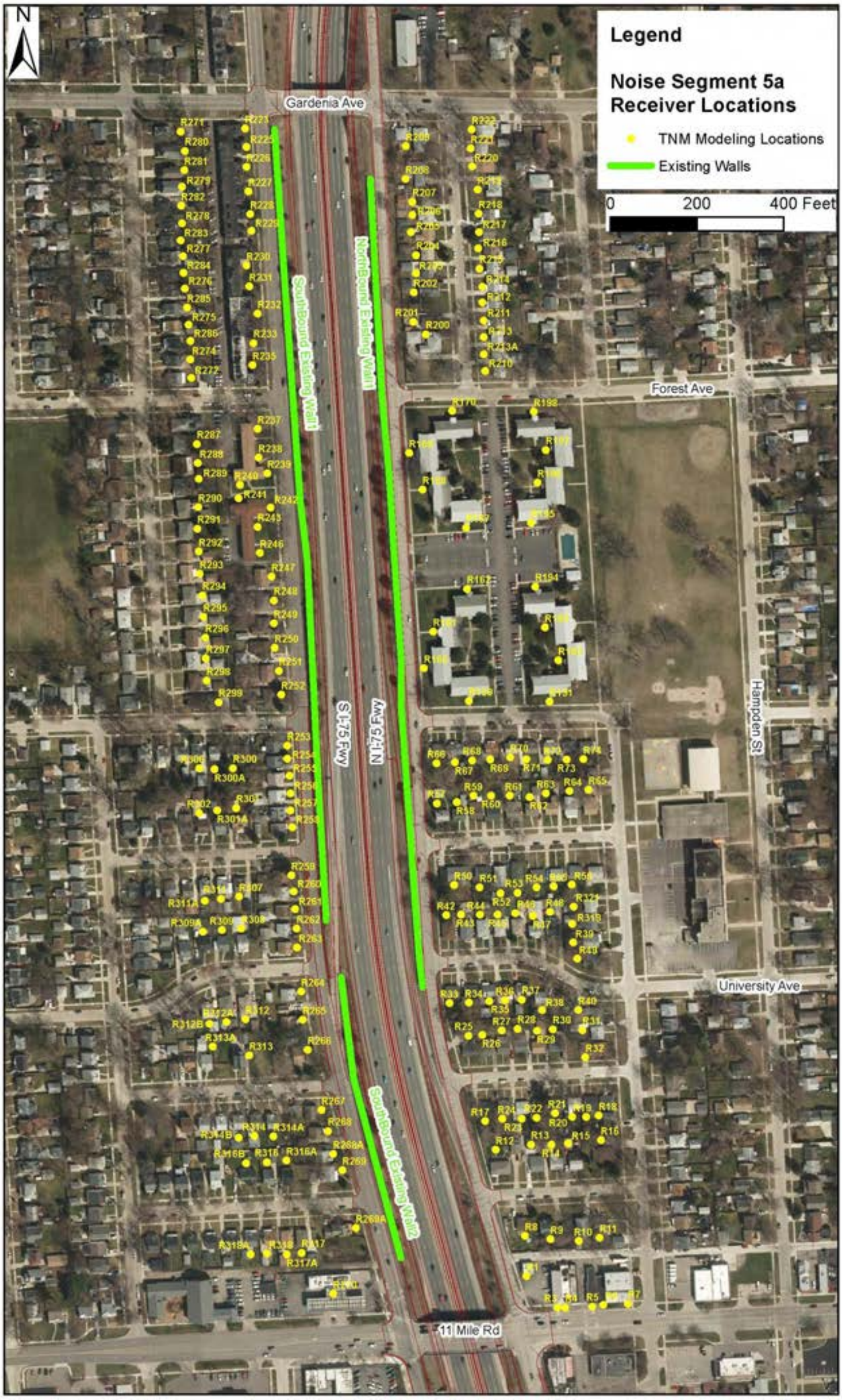
A noise analysis was completed for Noise Segment 5 NE from Lincoln Avenue to 11 Mile Road using 2040 Build Year peak hour PM traffic projections to determine the extent of noise impacts and the acoustical effectiveness of sound barriers at sensitive properties adjacent to the I-75. As part of the 2005 ROD findings, recommendations for sound barriers was provided for adjacent properties in the northbound direction. The present study has developed a sound barrier design that addresses those northbound abatement commitments. In addition, the present study evaluated a potential southbound replacement wall. The noise abatement analysis findings found that the proposed southbound replacement sound barrier did not satisfy MDOT's 5 decibel acoustic feasibility noise reduction requirement and thus is not recommended. As a result, the existing southbound sound barrier will remain unaltered. Therefore, within Noise Segment 5 NE, all proposed northbound sound barriers are recommended and will move to final design. Figure 7 provides the receiver locations and the study limits for Noise Segment 5 NE.

Figure 7 – Upper Portion of Noise Segment 5 Study Area Limits.

1.7 Summary of Abatement Analysis Findings Noise Segment 5A

A noise analysis was completed for Noise Segment 5A from to 11 Mile Road to Gardenia Avenue using 2040 Build Year traffic projections to determine noise impacts and abatement measures for noise sensitive properties adjacent to I-75. In the 2005 noise study, there were no existing sound barriers that saw reduced acoustic effectiveness under the proposed highway improvements and therefore no replacement barriers were considered. However, under the present proposed highway design improvements, one existing northbound noise wall and one existing southbound noise wall will need to be eliminated due to roadway widening and therefore replacement walls for these areas need to be developed. The replacement sound barriers are identified as Northbound Sound Barrier NB2 and Southbound Sound Barrier SB2. In addition, in the northbound direction, Northbound Sound Barrier NB1 was added as an extension to Northbound Sound Barrier NB2, because of projected 2040 Build year impacts identified between University Avenue and 11th Mile Road. In addition, a fourth replacement sound barrier, identified as Southbound Sound Barrier SB1 was evaluated because of 2040 Build Year noise impacts identified behind the existing wall that was unaffected by roadway widening. The noise abatement analysis findings found that proposed Southbound Sound Barrier SB1 satisfied all MDOT feasibility and reasonableness requirements. Therefore, within Noise Segment 5A study area, all four sound barriers, two in each direction, are recommended and will move to final design. These four barriers are identified as Northbound Sound Barriers NB1 and NB2 and Southbound Sound Barriers SB1 and SB2. Figure 8 provides the receiver locations and the study limits for Noise Segment 5

Figure 8 – Noise Segment 5A Study Area Limits



1.8 Summary of Abatement Analysis Findings Noise Segment 6

A noise analysis was completed for Noise Segment 6 from Gardenia Avenue to just north of 12 Mile Road using 2040 Build Year traffic projections to determined noise impact and abatement at noise sensitive properties adjacent to I-75. Southbound Sound Barrier SB1, which is a 2005 ROD approved abatement measure, was reanalyzed and optimized for maximum acoustical effectiveness under the current highway design improvements. In addition, two other sound barriers, one in each direction, was identified and evaluated for feasibility and reasonableness. The analysis findings indicate Southbound Sound Barrier SB2 is both feasible and reasonable in accordance with MDOT 2011 noise policy requirements. The proposed Northbound Sound Barrier NB1 did not meet the policy requirements. Therefore, within Noise Segment 6 both southbound SB1 and SB2 are recommended and will move to final design. Figure 9 provides the receiver locations and the study limits for Noise Segment 6.

Figure 9 – Noise Segment 6 Study Area Limits

1.9 Summary of Abatement Analysis Findings Noise Segment 6A

A noise analysis was completed for Noise Segment 6A between 12 Mile Road and 13 Mile Road using 2040 Build Year traffic projections to determine noise impacts and abatement measures for noise sensitive properties adjacent to northbound lanes along I-75. In the 2005 study, there were no ROD approved sound barriers identified in this portion of the I-75 corridor. This new study identified two alternate sound barrier design configurations for abatement assessment. One potential location places the sound barrier adjacent to the northbound right-of-way (ROW) line and the other potential location along the shoulder of I-75. The sound barrier shoulder configuration provides more acoustically effective noise reduction. However, in both cases, the proposed sound barrier design exceeds MDOT's reasonable cost of $46,967 per benefiting dwelling, therefore, no sound barriers within Noise Segment 6A study area are recommended for final design. Figure 10 provides the receiver locations and the study limits for Noise Segment 6A.

Figure 10 – Noise Segment 6A Study Area Limits

2.0 FUNDAMENTAL CONCEPTS OF ROADWAY NOISE

Physically in the natural environment, sound is generated by the vibration of the air molecules. The vibrations of the air molecules result in small fluctuations in air pressure. A sound wave is created when a series of these pressure waves move through the air. Sound waves vibrate at different rates or "frequencies." The faster an object vibrates, the higher the frequency of the sound wave. Slower vibration rates produce lower frequencies of sound. The human ear can detect a wide range of frequencies from about 20 Hz to 17,000 Hz. The decibel scale was developed to measure and quantify the loudness of sound energy of different levels of intensity. However, because human hearing sensitivity varies with the frequency of the sound, a weighting system was developed to provide a single number measure that better account for the human responses to environmental noise. The following sections describe some of the noise descriptors and impact criteria developed associated with the range of human hearing.

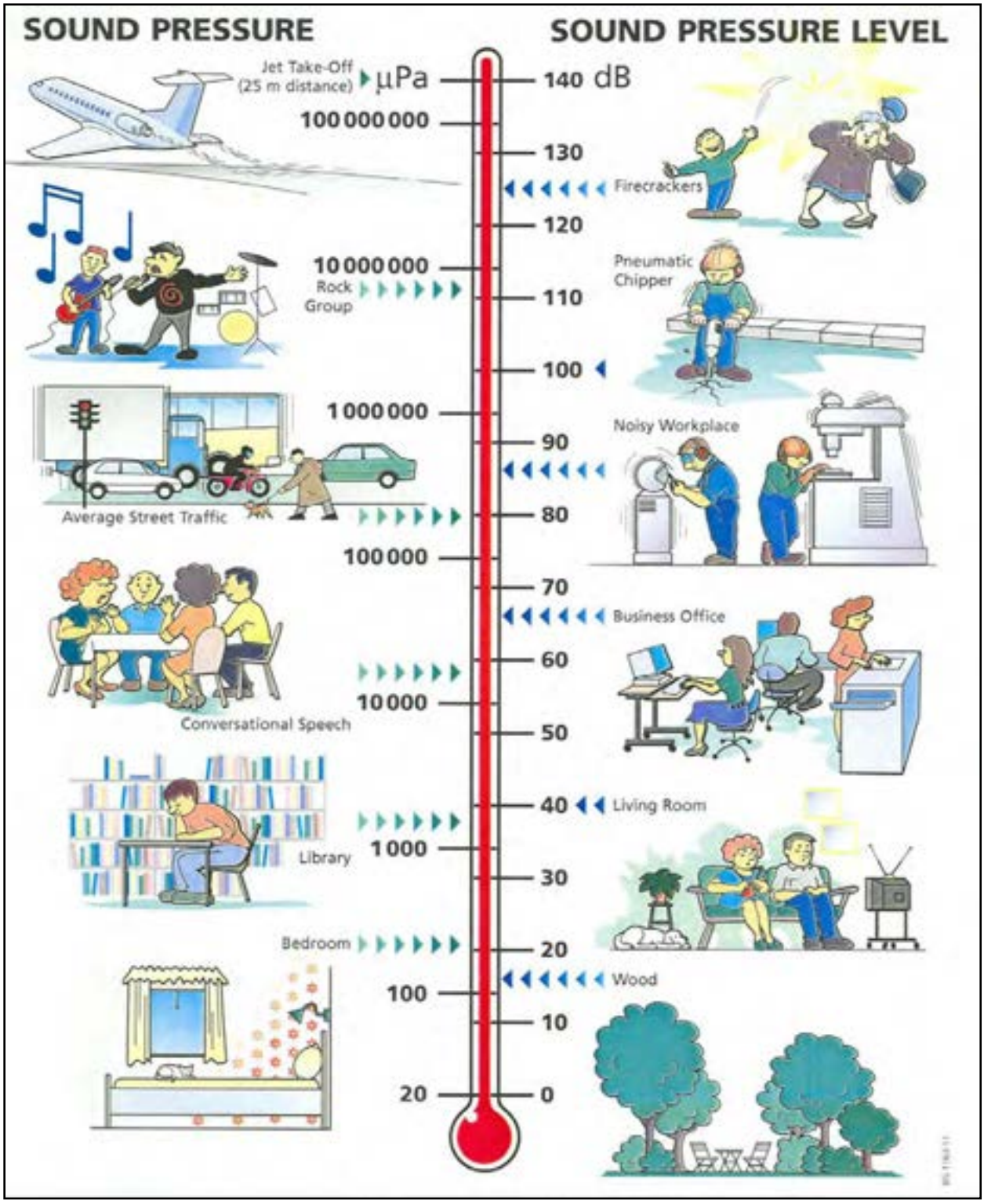
2.1 A-Weighted Sound Level

Sounds affecting humans occur in the natural environment at all times. Some sounds are necessary or desirable for communication or pleasure, many go unnoticed, and other sounds are truly unwanted or irritating. These unwanted sounds, result in annoyance and disturbance to the people living or working in the area. Therefore, unwanted sound is referred to as noise.

From many experiments with human participants, scientists have found that—unlike animals—the human ear is more sensitive to midrange frequencies as compared to either low or very high frequencies. Therefore, at the same sound level, the human ear perceives to hear midrange frequencies louder than low or very high frequencies. This characteristic of the human ear is considered by adjusting or weighting the spectrum of the measured sound level for the sensitivity of human hearing range. The weighting scale that best accounts for the sensitivity of the human hearing range is referred to as the A-weighted scale and is denoted by the "dB(A)" notation. The A-weighted sound level is a measure of sound intensity with one-third octave frequency characteristics that correspond to human response to noise. Acousticians accept the A-weighted sound level as a preferred descriptor for assessing human exposure and annoyance from environmental noise. Figure 11 below illustrates some common noise sources and sound pressure levels. An understanding of the following relationships is also helpful in providing a subjective impression of changes in the A-weighted sound level:

- A **3 dB(A) decrease** in A-weighted noise level is considered Barely Perceptible and represents a 50% loss in sound energy.
- A **5 dB(A) decrease** in A-weighted noise level is considered Readily Perceptible and represents a 67% loss in sound energy.
- A **10 dB(A) decrease** in A-weighted noise level is considered Half as Loud and represents a 90% loss in sound energy.
- A **20 dB(A) decrease i**n A-weighted noise level is considered One-Fourth as Loud and represents a 99% loss in sound energy.

Figure 11 – Typical Noise Levels



Source: Bruel and Kjaer: Environmental Noise, Sound and Vibration Measurements, 2000.

2.2 Noise Level Descriptors

A basic characteristic parameter of environmental noise, particularly near roadways; is its time-varying nature that fluctuates from moment to moment. These fluctuations constitute the time-varying property of roadway noise. Because traffic noise fluctuations vary from moment to moment, it is common practice to condense all of the information into a single number, called the “equivalent” sound level (Leq). The Leq is a measure of the average sound energy during a specified period of time (typically 1-hour duration). The Leq is defined as the constant level that, over a given period of time, transmits the same amount of acoustical energy to the receiver as the actual time-varying sound. Studies have shown that the A-weighted Leq noise descriptor is well correlated with human annoyance to sound; therefore, this descriptor is widely used by government agencies for environmental noise impact assessments. The Leq measured over a 1-hour period is referred to as the hourly Leq or Leq (1-hour) and has been established by Federal Highway Administration as the preferred noise descriptor to evaluate, analyze and assess highway traffic noise exposure.

2.3 Noise Impact Criteria

The proposed I-75 Modernization Project roadway improvements are defined as a Type I roadway improvement. This classification refers to projects that include federal funding for construction of highways on a new location alignment or the alteration of an existing highway resulting in a substantial change in either the horizontal or vertical alignment and or an increase in the number of through-traffic lanes. The noise analysis for this project was conducted in general compliance with the Code of Federal Regulations (CFR), Title 23, Part 772, the United States Department of Transportation, Federal Highway Administration (FHWA), Highway Traffic Noise Analysis and Abatement - Policy and Guidance (FHWA, 2011). The basic goals of noise criteria, as they apply to highway projects, are to minimize potential adverse noise impacts to a community and, where determined appropriate, provide feasible and reasonable measures to abate noise impacts.

To determine if highway noise levels are compatible with various land uses, the FHWA has developed noise abatement criteria and procedures to be used in the planning and design of highways. A summary of the FHWA Noise Abatement Criteria (NAC) for various land uses is presented in Table 1. These NAC levels represent the lower limit of what would constitute as a highway traffic noise impact for specific exterior land uses and activities and for certain indoor activities. Impact occurs when the predicted noise level at a qualified receptor approaches or exceeds the FHWA NAC, or when the difference between existing and future noise levels results in a substantial increase in noise level.

Table 1 – FHWA Noise Abatement Criteria (NAC)[1] Hourly A-Weighted Sound Level in dB(A)

ACTIVITY CATEGORY	ACTIVITY CRITERIA[2]		EVALUATION LOCATION	ACTIVITY DESCRIPTION
	$L_{eq}(h)$[3]	L10(h)[4]		
A	57	60	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[5]	67	70	Exterior	Residential.
C[5]	67	70	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	55	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[5]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--		Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities and warehousing.
G	--	--		Undeveloped lands that are not permitted.

[1] MDOT defines a noise impact as a 10 dB(A) increase between the existing noise level to the design year predicted noise level OR a predicted design year noise level that is 1 dB(A) less than the levels shown in Table 1.
[2] Either $L_{eq}(h)$ or L10(h) (but not both) may be used on a project. MDOT uses $L_{eq}(h)$. The $L_{eq}(h)$ and L10(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
[3] L_{eq} is the equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with $L_{eq}(h)$ being the hourly value of L_{eq}.
[4] L10(h) is the sound level that is exceeded ten percent of the time (90th percentile) for the period under consideration, with L10(h) being the hourly value of L10(h)
[5] Includes undeveloped lands permitted for this activity category.

MDOT's interpretation of the federal requirement is in the MDOT Highway Noise Analysis and Abatement Handbook, July 2011. MDOT defines "approach" as being within one decibel (dB(A)) of each NAC category. Therefore, all residential properties that have an exterior Leq noise level of 66 dB(A) or higher are considered to "approach or exceed" the NAC "B" land use activity criteria. Similarly, all properties covered by NAC "C" with Leq values of 66 dB(A) or higher would "approach or exceed" the NAC "C" criteria. In addition to the approach threshold impact, MDOT also considers an impact to occur if there is projected "substantial" noise level increase. A substantial noise level increase is defined as a projected build design noise level increase of 10 dB(A) or more above the corresponding existing noise level. Therefore, a noise impact can occur two separate ways: either when build noise levels approach or exceed the NAC or when a substantial increase from existing noise levels to project build conditions is predicted to occur.

When changes to the horizontal or vertical alignment of existing roadways are proposed (Type I roadway improvements) and because of these roadway modifications, traffic noise impacts are identified, noise mitigation must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area. Consideration for noise abatement does not in itself guarantee the abatement is warranted. In impacted communities, several assessment steps are evaluated to determine the feasibility and reasonableness of the abatement. The evaluation is based on many factors and considerations, which in equal order of importance include the following:

- Engineering constructability
- Restriction to traffic flow or property access
- Cost effectiveness
- Wall height constraints
- Acoustic effectiveness
- Whether zoning revisions to the existing land use are expected in the near future

MDOT's specific feasibility and reasonableness requirements are described in the section that follows.

2.4 Feasibility and Reasonableness

In the communities where impacts are predicted to occur, MDOT has defined a specific two-step process required to determine if abatement is possible. The following two steps, in respective order, must be considered. It should be noted that if a proposed sound barrier does not pass the feasibility phase, the second step of analysis for the reasonableness phase is not required. If a proposed sound barrier does not meet the requirements in the feasibility phase it is no longer considered viable.

Step 1: Is it feasible to provide highway traffic noise abatement from engineering, safety and the acoustic effectiveness standpoint?

Step 2: Is it reasonable to provide highway traffic noise abatement based on the consideration of the cost/benefit analysis, view point of a majority of the benefiting residences and property owners, and in providing sufficient noise attenuation?

Step 1: Feasibility Consideration: Once the future build highway design noise modeling analysis has been completed and the properties that exceed the NAC are identified, the noise abatement design is evaluated and assessed for feasibility. If a proposed sound barrier does not pass the feasibility phase it does not move forward to the reasonableness phase. The following factors must all be met in the feasibility phase (step 1) to continue to the reasonableness phase (step 2):

(1) Can a noise reduction of at least 5 dB(A) be achieved by 75% of impacted receptors?
(2) Can the sound barrier be designed and physically constructed at the proposed location?
(3) Will placement of the sound barrier cause a visual safety problem?
(4) Will placement of the sound barrier restrict access to vehicular or pedestrian travel?
(5) Will the sound barrier impact utilities or will the utilities impact the sound barrier?
(6) Will the sound barrier impact drainage or will the drainage impact the sound barrier?

Step 2 Reasonableness Consideration: Once the feasibility phase has been evaluated and each feasible requirement above is satisfied, a proposed sound barrier is evaluated for reasonableness. All of the following cost and acoustic requirements must be satisfied for a proposed sound barrier to be considered reasonable:

(1) Determine the total square-footage (length multiplied by height) assuming a $45 per square foot unit cost, can a proposed sound barrier be constructed such that the cost per benefiting unit (CPBU) must remain below $46,967.
(2) A benefited receptor is an impacted and non-impacted receptor that achieves a noise reduction of 5 dB(A) or greater noise reduction as a result of the sound barrier.
(3) The reasonableness phase requires a proposed sound barrier to achieve a noise reduction of 10 dB(A) or greater for at least one benefiting receptor and provide at least a 7 dB(A) reduction for 50% or more of the benefiting receptor sites.

2.5 Public Involvement Phase

In general, the public involvement phase takes place during the Early Preliminary Engineering (EPE) and Preliminary Engineering (PE) Phases as part of MDOT's Context Sensitive Solution (CSS) process. This also occurs throughout project development and has been completed over the course of the last ten years with the development of the I-75 corridor aesthetic design guide, community open houses, public meetings and public preference polls. The public coordination helped create the aesthetic concept design. Additional coordination can occur if needed to communicate the final locations of the proposed noise walls and to review the aesthetics that have been previously shared.

2.6 Third Party Funds

Third party funding for abatement enhancements above and beyond that what MDOT is responsible for is limited to aesthetics and functional elements such as vegetation plantings and specific wall graphics like a city seal. In addition, these funds cannot be used to contribute to the cost of barrier that has not satisfied the $46,967 per benefit reasonableness cost criteria. Regardless of contribution sharing, no sound barrier will be funded by MDOT which does not meet the feasibility and reasonableness requirements.

3.0 FUTURE 2040 BUILD CONDITIONS NOISE LEVEL ESTIMATES

3.1 Noise Segment 1: Noise Impact Analysis Findings

A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1 with each TNM receiver site representing a single or multiple dwelling receptor site. Noise predictions for modeling sites located adjacent to I-75 in the northbound direction are presented in Table 2 for receivers behind Northbound Sound Barrier NB1 and Northbound Sound Barrier NB2. Similarly, in the southbound direction, noise predictions for modeling sites located behind Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2 are presented in Table 3. All receivers behind the four proposed sound barriers consist of single family residential properties. The first column of each table identifies the TNM modeling receiver sites and column two provides an estimate of the TNM predicted build year 2040 unabated noise level with noise levels at or above the impact threshold shown in bold font. Column three specifies whether a noise impact occurs with the number of dwelling impacts shown in parenthesis. Column four indicates the noise reduction level achieved with abatement and the number of benefitting dwelling units indicated in parenthesis.

Figure 12 provides a graphical representation of each of the modeled TNM receiver sites and their projected relative noise exposure versus the MDOT impacted threshold. A red dot in Figure 12 indicates a noise impact and a green dot represents a TNM receiver location projected to remain below the 66 dB(A) impact threshold.

In general, the noise analysis findings indicate that all first-row receiver sites are projected to exceed the 66 dB(A) impact threshold and in a few isolated cases several second-row properties show elevated noise levels. In the northbound direction, a total of 73 TNM modeling locations were evaluated, and under future 2040 Build year traffic conditions, impacts are projected to occur at 32 single family homes. In the southbound direction, 70 TNM modeling receiver points all representing single family homes were modeled, and noise levels above the impact threshold is projected to occur at 23 dwellings under future 2040 Build year traffic conditions.

Table 2 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barriers NB1 &NB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R1	64	No (0)	2 (0)
R2	**73**	**Yes (1)**	**6 (1)**
R3	64	No (0)	**5 (1)**
R4	60	No (0)	4 (0)
R5	**73**	**Yes (1)**	**5 (1)**
R6	60	No (0)	4 (0)
R7	59	No (0)	4 (0)
R8	**72**	**Yes (1)**	**5 (1)**
R9	65	No (0)	**5 (1)**
R10	59	No (0)	4 (0)
R11	64	No (0)	**5 (1)**
R12	**72**	**Yes (1)**	**5 (1)**
R13	**77**	**Yes (1)**	**6 (1)**
R14	64	No (0)	**5 (1)**
R15	60	No (0)	4 (0)
R16	64	No (0)	2 (0)
R17	**66**	**Yes (1)**	**6 (1)**
R18	**68**	**Yes (1)**	**8 (1)**
R19	**77**	**Yes (1)**	**6 (1)**
R20	**71**	**Yes (1)**	1 (0)
R21	**68**	**Yes (1)**	0 (0)
R22	61	No (0)	1 (0)
R23	65	No (0)	1 (0)
R24	**66**	**Yes (1)**	1 (0)
R25	**71**	**Yes (1)**	0 (0)
R26	**72**	**Yes (1)**	**5 (1)**
R27	**67**	**Yes (1)**	**7 (1)**
R28	**67**	**Yes (1)**	4 (0)

Table 2 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barriers NB1 &NB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R29	**74**	**Yes (1)**	**6 (1)**
R30	**74**	**Yes (1)**	**8 (1)**
R31	**68**	**Yes (1)**	**8 (1)**
R32	63	No (0)	**6 (1)**
R33	63	No (0)	**6 (1)**
R34	64	No (0)	**6 (1)**
R35	**66**	**Yes (1)**	**7 (1)**
R36	**76**	**Yes (1)**	**8 (1)**
R37	**73**	**Yes (1)**	**7 (1)**
R38	**67**	**Yes (1)**	**6 (1)**
R39	65	No (0)	**6 (1)**
R40	61	No (0)	**5 (1)**
R41	65	No (0)	**6 (1)**
R42	**72**	**Yes (1)**	**8 (1)**
R43	**71**	**Yes (1)**	**6 (1)**
R44	**67**	**Yes (1)**	**5 (1)**
R45	55	No (0)	3 (0)
R46	58	No (0)	4 (0)
R47	61	No (0)	3 (0)
R48	65	No (0)	4 (0)
R49	60	No (0)	3 (0)
R50	59	No (0)	3 (0)
R51	**66**	**Yes (1)**	**5 (1)**
R52	**66**	**Yes (1)**	4 (0)
R99	60	No (0)	2 (0)
R100	58	No (0)	2 (0)
R104	59	No (0)	2 (0)
R105	60	No (0)	1 (0)
R106	63	No (0)	1 (0)
R107	63	No (0)	**5 (1)**
R108	63	No (0)	4 (0)
R116	62	No (0)	**5 (1)**
R117	55	No (0)	3 (0)
R118	55	No (0)	2 (0)

Table 2 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barriers NB1 &NB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R119	55	No (0)	2(0)
R122	62	No (0)	4(0)
R123	62	No (0)	4(0)
R130	57	No (0)	3(0)
R131	57	No (0)	3(0)
R132	63	No (0)	4(0)
R146	**69**	**Yes (1)**	**5(1)**
R147	**67**	**Yes (1)**	**5(1)**
R149	**74**	**Yes (1)**	**5(1)**
R150	**68**	**Yes (1)**	**6(1)**
R152	**76**	**Yes (1)**	**7(1)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**32**	**38[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2]Includes 12 non-impacted benefited receptors.

Table 3 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barriers SB1 & SB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R53	65	No (0)	**5(1)**
R54	63	No (0)	**5(1)**
R55	**66**	**Yes (1)**	4(0)
R56	**69**	**Yes (1)**	**5(1)**
R57	60	No (0)	**5(1)**
R58	**68**	**Yes (1)**	**7(1)**
R59	**70**	**Yes (1)**	**7(1)**
R60	64	No (0)	**5(1)**
R61	**69**	**Yes (1)**	**6(1)**
R62	63	No (0)	**5(1)**
R63	**70**	**Yes (1)**	**5(1)**
R64	63	No (0)	**7(1)**
R65	56	No (0)	2(0)
R66	64	No (0)	**6(1)**
R67	56	No (0)	1(0)
R68	**74**	**Yes (1)**	**8(1)**
R69	**70**	**Yes (1)**	**8(1)**
R70	**73**	**Yes (1)**	**7(1)**
R71	65	No (0)	4(0)
R72	**73**	**Yes (1)**	**9(1)**
R73	65	No (0)	**8(1)**
R74	58	No (0)	4(0)
R75	**69**	**Yes (1)**	**7(1)**
R76	61	No (0)	**5(1)**
R77	60	No (0)	4(0)
R78	**71**	**Yes (1)**	**8(1)**
R79	**67**	**Yes (1)**	**7(1)**
R80	60	No (0)	**5(1)**
R81	55	No (0)	2(0)
R82	63	No (0)	**6(1)**
R83	**73**	**Yes (1)**	**8(1)**

Table 3 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barriers SB1 & SB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R84	65	No (0)	**6(1)**
R85	63	No (0)	**5(1)**
R86	**73**	**Yes (1)**	**7(1)**
R87	62	No (0)	**5(1)**
R88	57	No (0)	4(0)
R89	**66**	**Yes (1)**	**5(1)**
R90	63	No (0)	**5(1)**
R91	59	No (0)	4(0)
R92	65	No (0)	**6(1)**
R93	**70**	**Yes (1)**	**6(1)**
R94	63	No (0)	4(0)
R95	64	No (0)	**6(1)**
R96	6	No (0)	4(0)
R98	**76**	**Yes (1)**	**6(1)**
R101	63	No (0)	4(0)
R102	61	No (0)	**5(1)**
R103	59	No (0)	**5(1)**
R109	61	No (0)	4(0)
R110	60	No (0)	**5(1)**
R111	65	No (0)	**8(1)**
R112	60	No (0)	**5(1)**
R113	63	No (0)	4(0)
R114	**68**	**Yes (1)**	**8(1)**
R115	65	No (0)	**6(1)**
R120	**66**	**Yes (1)**	**5(1)**
R121	56	No (0)	2(0)
R124	58	No (0)	3(0)
R125	59	No (0)	4(0)
R126	62	No (0)	**5(1)**

Table 3 – Summary of Noise Segment 1 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barriers SB1 & SB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R127	59	No (0)	**5(1)**
R128	58	No (0)	3(0)
R129	56	No (0)	2(0)
R137	**66**	**Yes (1)**	**6(1)**
R138	64	No (0)	4(0)
R139	62	No (0)	4(0)
R140	61	No (0)	**5(1)**
R141	59	No (0)	4(0)
R148	**76**	**Yes (1)**	**7(1)**
R154	**71**	**Yes (1)**	**7(1)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**23**	**48[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2] Includes 26 non-impacted receptor benefits.

Figure 12 – Summary of Noise Segment 1 Projected 2040 Build Year Impacted Receivers

3.2 Noise Segment 2: Noise Impact Analysis Findings

A summary of Noise Segment 2 noise levels under 2040 Build Year peak hour PM traffic conditions for all TNM modeling receiver sites adjacent to I-75 in the northbound direction are provided in Table 4. The TNM modeling receiver sites adjacent to the I-75 in the southbound direction are provided in Table 5. A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1. Each TNM receiver site can represent either a single unit or multiple dwelling units. Column one in each table identifies the TNM modeling receiver sites, column two provides an estimate of the TNM predicted unabated future build year noise levels with each level at or above the impact threshold shown in bold font. Additionally, column three specifies whether a noise impact occurs and the number of dwelling impacts shown in parenthesis. Column four indicates the noise reduction level achieved and the number of benefiting dwellings is shown in parenthesis.

Receptor sites behind the two-proposed northbound barriers consist of mainly single family residential properties, the United Oaks Elementary School and its playground, the Hazel Park Jr. High and the First Free Will Baptist Church. Receivers behind the two southbound sound barriers consist of single family residential properties and the Tabernacle Baptist Church. Figure 13 provides a graphical representation of each of the modeled TNM receiver sites and their projected relative noise exposure versus the MDOT impacted threshold. A red dot in Figure 13 indicates a noise impact and a green dot represents a TNM receiver location projected to remain below the 66 dB(A) impact threshold.

In general, the noise analysis findings indicate that all first-row receiver sites are projected to exceed the 66 dB(A) impact threshold and in a few isolated cases several second-row properties show elevated noise levels. In the northbound direction, a total of 71 TNM modeling locations were evaluated, and under future 2040 Build Year traffic conditions, impacts are projected to occur at 38 of these properties. In the southbound direction, 44 TNM modeling receiver points were modeled, and noise levels above the impact threshold is projected to occur at 27 dwellings under the same future traffic conditions.

Table 4 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barriers NB1 &NB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R89	60	No (0)	1(0)
R87	61	No (0)	4(0)
R86	64	No (0)	4(0)
R85	**68**	**Yes (1)**	3(0)
R88	Vacant Lot	Vacant Lot	Vacant Lot
First Free Will Baptist Church	**73**	**Yes (9)**	**5(9)**
United Oaks Elementary School Playground Area	54	No (0)	3(0)
Hazel Park Jr High School	53	No (0)	3(0)
R90	57	No (0)	1(0)
R91	**71**	**Yes (1)**	**6(1)**
R92	65	No (0)	**5(1)**
R93	61	No (0)	**5(1)**
R94	59	No (0)	**5(1)**
R95	58	No (0)	3(0)
R97	**72**	**Yes (1)**	**7(1)**
R98	**71**	**Yes (1)**	**6(1)**
R99	**69**	**Yes (1)**	**6(1)**
R100	**67**	**Yes (1)**	**6(1)**
R101	**66**	**Yes (1)**	**6(1)**
R102	64	No (0)	**6(1)**
R103	**76**	**Yes (1)**	**9(1)**
R104	**74**	**Yes (1)**	**9(1)**
R105	**69**	**Yes (1)**	**6(1)**
R106	**66**	**Yes (1)**	**6(1)**
R107	62	No (0)	**5(1)**
R108	63	No (0)	**5(1)**
R109	64	No (0)	**5(1)**
R110	63	No (0)	**5(1)**

Table 4 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barriers NB1 &NB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R111	62	No (0)	4(0)
R114	**74**	**Yes (1)**	**7(1)**
R115	**73**	**Yes (1)**	**7(1)**
R116	**72**	**Yes (1)**	**7(1)**
R117	**69**	**Yes (1)**	**7(1)**
R118	**67**	**Yes (1)**	**7(1)**
R119	65	No (0)	**6(1)**
R120	63	No (0)	**6(1)**
R121	62	No (0)	**5(1)**
R123	**73**	**Yes (1)**	**5(1)**
R124	Vacant Lot	Vacant Lot	Vacant Lot
R125	**70**	**Yes (1)**	4(0)
R126	**68**	**Yes (1)**	4(0)
R127	65	No (0)	3(0)
R128	61	No (0)	3(0)
R129	59	No (0)	3(0)
R130	59	No (0)	4(0)
R131	58	No (0)	3(0)
R132	57	No (0)	3(0)
R133	57	No (0)	3(0)
R134	57	No (0)	3(0)
R135	**71**	**Yes (1)**	4(0)
R136	**70**	**Yes (1)**	4(0)
R137	**69**	**Yes (1)**	**5(1)**
R138	**68**	**Yes (1)**	4(0)
R139	**68**	**Yes (1)**	4(0)
R140	**67**	**Yes (1)**	**5(1)**
R141	**69**	**Yes (1)**	0(0)
R142	**66**	**Yes (1)**	2(0)
R143	**66**	**Yes (1)**	2(0)
R144	**66**	**Yes (1)**	2(0)
R145	62	No (0)	1(0)
R146	61	No (0)	2(0)
R147	60	No (0)	2(0)

Table 4 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barriers NB1 &NB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R148	57	No (0)	1(0)
R149	57	No (0)	2(0)
R150	57	No (0)	3(0)
R151	56	No (0)	2(0)
R152	57	No (0)	3(0)
R153	Vacant Lot	Vacant Lot	Vacant Lot
R155	60	No (0)	3(0)
R156	60	No (0)	4(0)
R157	57	No (0)	3(0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**38**	**38[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2]Includes 11 non-impacted benefited dwellings.

Table 5 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement1 Adjacent to Southbound Sound Barriers SB1 & SB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
Tabernacle Baptist Church	**71**	**Yes (14)**	4(0)
R25	**72**	**Yes (1)**	**6(1)**
R28	**70**	**Yes (1)**	**7(1)**
R29	**73**	**Yes (1)**	**6(1)**
R30	**74**	**Yes (1)**	**8(1)**
R31	**69**	**Yes (1)**	**5(1)**
R33	65	No (0)	3(0)
R35	**69**	**Yes (1)**	**6(1)**
R38	**68**	**Yes (1)**	**5(1)**
R54	**71**	**Yes (1)**	**7(1)**
R56	57	No (0)	3(0)
R58	58	No (0)	3(0)
R60	59	No (0)	3(0)
R76	58	No (0)	1(0)
R78	**71**	**Yes (1)**	**8(1)**
R79	**74**	**Yes (1)**	**9(1)**
R81	57	No (0)	2(0)
R83	56	No (0)	2(0)
R158	**70**	**Yes (1)**	**7(1)**
R159	63	No (0)	**6(1)**
R160	62	No (0)	**5(1)**
R161	55	No (0)	2(0)
R162	54	No (0)	2(0)
R163	53	No (0)	2(0)
R164	**68**	**Yes (1)**	4(0)
R165	65	No (0)	3(0)
R166	63	No (0)	3(0)
R167	62	No (0)	3(0)
R168	60	No (0)	3(0)
R169	58	No (0)	2(0)
R170	56	No (0)	2(0)

Table 5 – Summary of Noise Segment 2 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement1 Adjacent to Southbound Sound Barriers SB1 & SB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R171	56	No (0)	3(0)
R172	58	No (0)	2(0)
R173	58	No (0)	2(0)
R174	55	No (0)	2(0)
R175	55	No (0)	2(0)
R176	64	No (0)	4(0)
R177	61	No (0)	3(0)
R178	57	No (0)	2(0)
R179	56	No (0)	2(0)
R180	56	No (0)	2(0)
R181	57	No (0)	2(0)
R182	**69**	**Yes (1)**	**7(1)**
R183	64	No (0)	1(0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**27**	**14[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2]Includes 2 non-impacted benefited dwellings.

Figure 13 – Summary of Noise Segment 2 Projected 2040 Build Year Impacted Receivers

3.3 Noise Segment 3: Noise Impact Analysis Findings

A summary of the Noise Segment 3 noise level estimates for 2040 Build Year traffic conditions for all TNM modeling sites are presented in Table 6 through Table 8. A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1. Each TNM receiver site may represent either a single unit or multiple dwelling units. There are three proposed sound barriers identified within the Noise Segment 3 study area, one sound barrier in the I-75 northbound direction and two in the southbound direction. Noise predictions for receiver sites modeled adjacent to I-75 northbound lanes are presented in Table 6. Similarly, receiver sites modeled in the southbound direction are summarized in Table 7 and Table 8 for those properties behind ROD approved Sound Barrier SB1 and proposed Sound Barrier SB2 respectively. The study area consists of both single family residential properties, multi-family dwellings (apartments) and the First Baptist Church. The first column of each table identifies the TNM modeling receiver number, column two provides an estimate of the TNM predicted unabated 2040 Build Year noise level with levels above the impact threshold shown in bold font. Additionally, column three specifies whether a noise impact occurs with the total number of impacts shown in parenthesis and column four indicates the noise reduction level achieved with abatement and the number of benefiting dwellings shown in parenthesis.

Figure 14 provides a graphical representation of each of the modeled TNM receiver sites and their projected relative noise exposure versus the MDOT impacted threshold. A red dot in Figure 14 indicates a noise impact and a green dot represents a TNM receiver location projected to remain below the 66 dB(A) impact threshold.

In general, the noise analysis findings indicate that unabated noise levels at all first-row receiver sites are projected to exceed the 66 dB(A) impact threshold and in some cases second row properties show exceedances particularly on the northbound side of I-75. Under future build conditions, in the northbound direction, a total of 42 TNM sites were modeled representing 60 receptor dwellings with impacts predicted to occur at 46 dwellings. In the southbound direction, 64 TNM receiver modeling sites were modeled representing 77 receptor dwellings with impacts predicted to occur at 27 dwellings in the area behind 2005 ROD approved Sound Barrier SB1 and 6 dwelling impacts in the general area behind proposed Sound Barrier SB2.

Table 6 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barrier NB1

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R2	**71**	**Yes (1)**	2(0)
R3	**76**	**Yes (1)**	**8(1)**
R4	**68**	**Yes (1)**	**9(1)**
R5	**68**	**Yes (1)**	**7(1)**
R6	**77**	**Yes (1)**	**10(1)**
R7	**72**	**Yes (1)**	**9(1)**
R8	**70**	**Yes (1)**	**6(1)**
R9	**75**	**Yes (1)**	**9(1)**
R10	65	No (0)	**6(1)**
R11	57	No (0)	4(0)
R12	**74**	**Yes (1)**	**8(1)**
R13	**70**	**Yes (1)**	**7(1)**
R14	**67**	**Yes (1)**	**5(1)**
R16	**74**	**Yes (1)**	**7(1)**
R17	**68**	**Yes (1)**	**7(1)**
R18	64	No (0)	**6(1)**
R19	**74**	**Yes (1)**	**7(1)**
R20	**68**	**Yes (1)**	**7(1)**
R21	**66**	**Yes (1)**	**6(1)**
R25	**69**	**Yes (1)**	**5(1)**
R26	60	No (0)	**5(1)**
R27	**73**	**Yes (1)**	4(0)
R28	**69**	**Yes (1)**	**6(1)**
R29	**66**	**Yes (1)**	**6(1)**
R30	**71**	**Yes (1)**	2(0)
R31	62	No (0)	1(0)
R53	**66**	**Yes (1)**	**5(1)**
R54	**66**	**Yes (1)**	**5(1)**

Table 6 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Northbound Barrier NB1 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R55	60	No (0)	**6(1)**
R57	63	No (0)	**5(1)**
R58	56	No (0)	3(0)
R59	63	No (0)	**5(1)**
R60	55	No (0)	3(0)
R62	54	No (0)	2(0)
R63	61	No (0)	4(0)
R64	58	No (0)	2(0)
R65	56	No (0)	2(0)
R134	**74**	**Yes (5)**	**6(5)**
R135	**74**	**Yes (6)**	**7(6)**
R136	**77**	**Yes (5)**	**6(5)**
R137	**77**	**Yes (6)**	**8(6)**
R138	**77**	**Yes (1)**	2(0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**46**	**48[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2] Includes 6 non-impacted receptor benefits.

Table 7 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barrier SB1

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R33	**71**	**Yes (1)**	4(0)
R34	63	No	**6(1)**
R35	**70**	**Yes (1)**	**7(1)**
R36	**71**	**Yes (1)**	**7(1)**
R38	**66**	**Yes (1)**	**8(1)**
R40	65	**Yes (1)**	**9(1)**
R41	**77**	**Yes (3)**	**11(3)**
R42	**66**	**Yes (1)**	**8(1)**
R43	**77**	**Yes (3)**	**11(3)**
First Baptist Church	**75**	**Yes (6)**	**9(6)**
R50 2nd Floor	**80**	**Yes (3)**	**11(3)**
R51 2nd Floor	**80**	**Yes (3)**	**11(3)**
R67	63	No	**5(1)**
R68	55	No	3(0)
R69	54	No	2(0)
R71	40	No	2(0)
R72	64	No	**6(1)**
R73	59	No	**5(1)**
R74	56	No	4(0)
R76	61	No	**6(1)**
R77	56	No	4(0)
R79	59	No	**5(1)**
R80	60	No	4(0)
R81	52	No	1(0)
R83	**68**	**Yes (1)**	**8(1)**
R84	62	No	**7(1)**
R85	62	No	**6(1)**
R86	60	No	4(0)
R88	54	No	3(0)
R89	53	No	2(0)
R90	58	No	**6(1)**
R91	54	No	3(0)
R99	**66**	**Yes (1)**	**7(1)**
R100	60	No	**5(1)**

Table 7 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barrier SB1 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R102	**68**	**Yes (1)**	**7(1)**
R103	60	No	**6(1)**
R104	55	No	3(0)
R106	**72**	**Yes (1)**	**9(1)**
R107	63	No	**6(1)**
R108	62	No	**6(1)**
R110	59	No	**5(1)**
R111	63	No	**7(1)**
R112	60	No	**5(1)**
R113	62	No	**7(1)**
R114	63	No	**8(1)**
R115	57	No	4(0)
R116	63	No	**7(1)**
R117	64	No	**7(1)**
R118	62	No	**6(1)**
R119	61	No	3(0)
R120	61	No	2(0)
R121	56	No	1(0)
NUMBER OF RECEPTOR IMPACTS & BENEFITS		**28**	**47[2]**

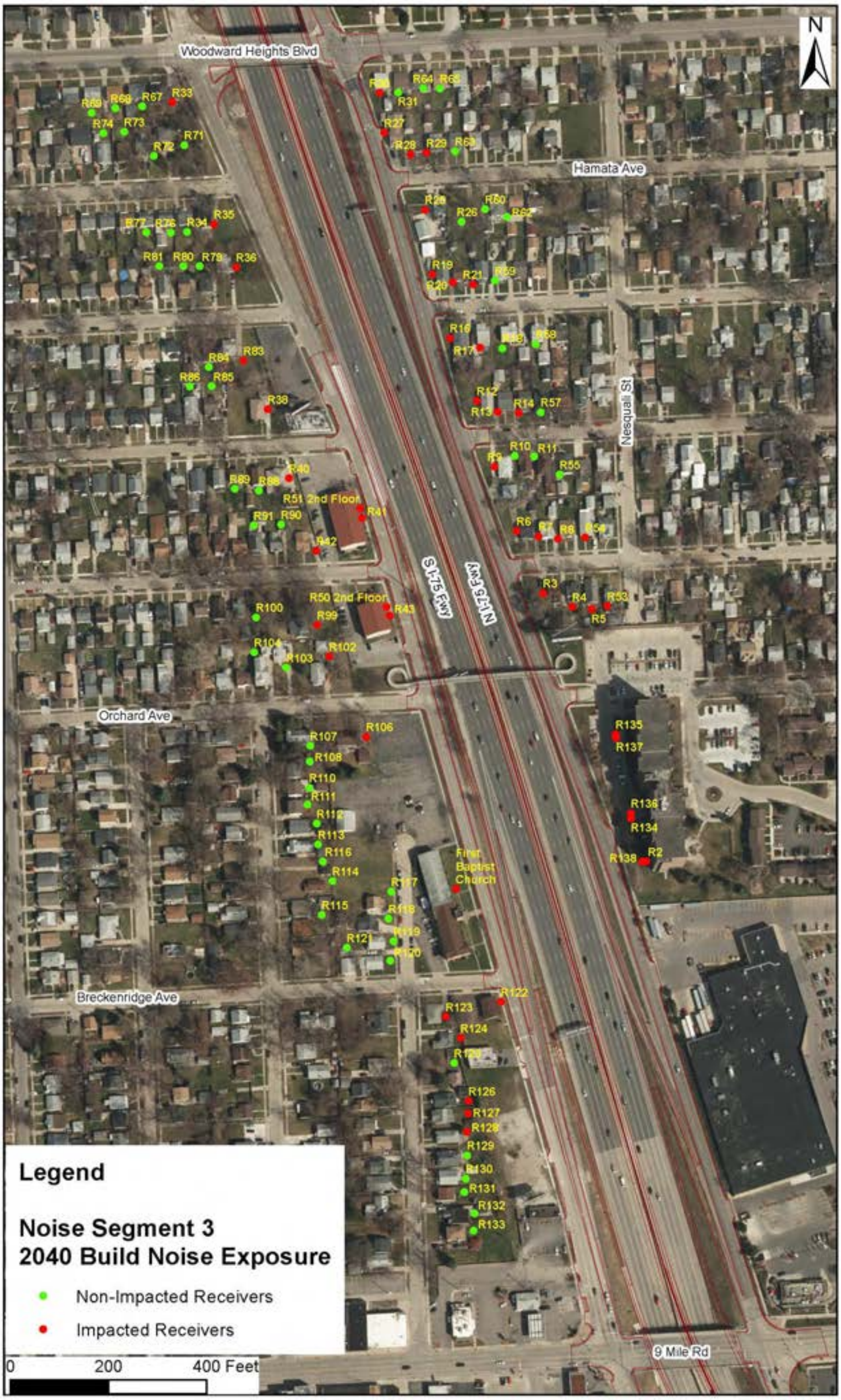
Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.
[2]Includes 20 non-impacted receptor benefits.

Table 8 – Summary of Noise Segment 3 Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Sound Barrier SB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R122	**78**	**Yes (1)**	**8(1)**
R123	**66**	**Yes (1)**	**5(1)**
R124	**67**	**Yes (1)**	4(0)
R125	65	No	3(0)
R126	**66**	**Yes (1)**	**6(1)**
R127	**66**	**Yes (1)**	**6(1)**
R128	**66**	**Yes (1)**	**6(1)**
R129	65	No	**5(1)**
R130	62	No	4(0)
R131	64	No	4(0)
R132	65	No	4(0)
R133	64	No	4(0)
NUMBER OF RECEPTOR IMPACTS & BENEFITS		**6**	**6[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.
[2]Includes one non-impacted receptor benefit.

Figure 14 – Summary of Noise Segment 3 Projected 2040 Build Year Impacted Receivers



3.4 Noise Segment 4: Noise Impact Analysis Findings

A summary of the Noise Segment 4 Build noise levels under future 2040 Build Year traffic conditions is provided in Table 9 for all TNM modeling receiver sites adjacent to I-75 in the northbound direction. Likewise, Table 10 and Table 11 provide a summary for predicted future build noise levels at all TNM modeling receiver sites adjacent to I-75 in the southbound direction. A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1. Each TNM receiver site can either represent a single unit or multiple dwelling units. Noise predictions for modeling sites located behind Northbound Sound Barrier NB1+NB2 are combined and presented in Table 9. Noise predictions for modeling sites located behind Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2 (2A+2B+2C) are provided in Tables 10 and 11 respectively. Receivers behind barrier NB1+NB2 consist of single family residential properties, the Landmark Community Church and the Serenity Christian Church. Receivers behind barrier SB1 consist of single family residential properties and receivers behind barrier SB2 include single family residential properties, the Roosevelt Elementary, and the Green Acres Park. Column one in each table identifies the TNM modeling site, column two provides an estimate of the TNM predicted unabated 2040 Build Year noise level with noise levels at or above the impact threshold shown in bold font. Additionally, column three specifies whether a noise impact occurs with the number of dwelling impacts shown in parenthesis and column four indicates the noise reduction level achieved with abatement and with the number of benefitting dwellings indicated in parenthesis.

Figure 15 provides a graphical representation of each of the modeled TNM receiver sites and their projected relative noise exposure versus the MDOT impacted criteria. A red dot in Figure 15 indicates a noise impact and a green dot represents a TNM modeling site that is expected to remain below the 66 dB(A) impact threshold.

In general, the noise analysis findings indicate that all first-row receiver sites are projected to exceed the 66 dB(A) impact threshold. As indicated in Table 9 and in the northbound direction, a total of 57 TNM modeling locations were evaluated, and impacts are projected to occur at 43 of these locations under future 2040 traffic conditions of which 29 impacts are represented at the Landmark Community Church. To maintain service drive access to the church, the proposed northbound sound barrier cannot extend north of the church property. However, unabated interior noise levels inside the church are expected to remain below 51 dB(A) NAC D Activity Category. In the southbound direction and presented in Table 10, a total of 9 TNM modeling locations were evaluated with impacts predicted at only two receivers behind proposed Southbound Sound Barrier SB1. Additionally, in the area adjacent to proposed Southbound Sound Barrier SB2 (2A+2B+2C), shown in Table 11, a total of 24 TNM modeling receivers were modeled with noise impacts projected at 48 dwellings under future 2040 Build Year traffic conditions.

Table 9 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barrier NB1+NB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R1	**71**	**Yes (1)**	1 (0)
R2	**71**	**Yes (1)**	4 (0)
R3	62	No (0)	1 (0)
R4 Serenity Christian Church	**72**	**Yes (8)**	**5 (8)**
R5	**71**	**Yes (1)**	**5 (1)**
R6	**72**	**Yes (1)**	**5 (1)**
R8	**71**	**Yes (1)**	**6 (1)**
Landmark Community Church	**73** (48 dB(A) Interior Noise Level)	**Yes** **Exterior Impact (29)[2]** No Interior Impact	1 (0)
R56	62	No (0)	4 (0)
R57	**67**	**Yes (1)**	**6 (1)**
R92	58	No (0)	3 (0)
R93	59	No (0)	4 (0)
R94	63	No (0)	0 (0)
R95	60	No (0)	0 (0)
R96	56	No (0)	1 (0)
R97	55	No (0)	0 (0)
R98	55	No (0)	0 (0)
R99	51	No (0)	2 (0)
R100	52	No (0)	1 (0)
R101	55	No (0)	0 (0)
R102	52	No (0)	0 (0)
R103	56	No (0)	2 (0)
R104	55	No (0)	2 (0)
R105	54	No (0)	1 (0)
R106	53	No (0)	2 (0)
R107	52	No (0)	2 (0)
R108	52	No (0)	2 (0)
R109	51	No (0)	2 (0)

Table 9 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barrier NB1+NB2 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R110	59	No (0)	3 (0)
R111	58	No (0)	3 (0)
R112	56	No (0)	3 (0)
R113	57	No (0)	**5 (1)**
R114	55	No (0)	3 (0)
R115	53	No (0)	2 (0)
R116	53	No (0)	2 (0)
R117	63	No (0)	4 (0)
R118	62	No (0)	4 (0)
R119	59	No (0)	4 (0)
R120	57	No (0)	4 (0)
R121	56	No (0)	4 (0)
R122	64	No (0)	4 (0)
R123	59	No (0)	**5 (1)**
R124	58	No (0)	4 (0)
R125	57	No (0)	4 (0)
R126	54	No (0)	3 (0)
R127	61	No (0)	0 (0)
R128	58	No (0)	0 (0)
R129	56	No (0)	0 (0)
R130	62	No (0)	0 (0)
R131	54	No (0)	0 (0)
R132	52	No (0)	0 (0)
R133	65	No (0)	0 (0)
R134	60	No (0)	0 (0)
R135	58	No (0)	0 (0)
R136	61	No (0)	0 (0)
R137	51	No (0)	0 (0)
R138	65	No (0)	0 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**43[2]**	**14[3]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2] Includes 29 exterior noise impacts at the Landmark Community Church, which is not included in the abatement feasibility and reasonableness assessment, because the proposed sound barrier cannot be extended to cover the church area without restricting property access. However, interior noise levels at the church, without abatement, are projected to remain below the 51-dB(A) impact approach level.

[3] Includes 2 non-impacted benefited receptors.

Table 10 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to South-bound Barrier SB1

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R12	**69**	**Yes (1)**	4 (0)
R13	**69**	**Yes (1)**	3 (0)
R46	64	No (0)	2 (0)
R47	61	No (0)	2 (0)
R48	60	No (0)	2 (0)
R139	57	No (0)	2 (0)
R140	59	No (0)	3 (0)
R141	60	No (0)	3 (0)
R142	59	No (0)	3 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**2**	**0**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

Table 11 – Summary of Noise Segment 4 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Southbound Barrier SB2 (2A+2B+2C)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R14	**67**	**Yes (1)**	3 (0)
R19	**69**	**Yes (1)**	**6 (1)**
R22	**70**	**Yes (1)**	**6 (1)**
R58	**69**	**Yes (1)**	**6 (1)**
R63	**68**	**Yes (1)**	**6 (1)**
R64	65	No (0)	**6 (1)**
R65	**72**	**Yes (1)**	**8 (1)**
R66	63	No (0)	1 (0)
R68	**71**	**Yes (1)**	4 (0)
R70	**67**	**Yes (1)**	**6 (1)**
R71	**69**	**Yes (1)**	**6 (1)**
R79	59	No (0)	4 (0)
R80	62	No (0)	**5 (1)**
R82	62	No (0)	4 (0)
R83	62	No (0)	**5 (1)**
R84	64	No (0)	**5 (1)**
R85	64	No (0)	**6 (1)**
Roosevelt Elementary School	**70**	**Yes (16)**	**7 (16)**
R143	58	No (0)	2 (0)
R144	61	No (0)	**5 (1)**
R145	58	No (0)	4 (0)
R146 (Green Acres Park)	**70**	**Yes (23)**	**7 (23)**
R147	60	No (0)	1(0)
R148	58	No (0)	4(0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**48**	**52[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2]Includes 6 non-impacted benefited receptors.

Figure 15 – Summary of Noise Segment 4 Projected 2040 Build Year Impacted Receivers

3.5 Noise Segment 5 SE: Noise Impact Analysis Findings

Table 12 provides a summary of the predicted future 2040 Build noise levels without abatement in the Noise Segment 5 SE study area in the northbound direction between the I-696 interchange and Lincoln Drive. Similarly, in the southbound direction, Table 13 provides a summary of the predicted future 2040 Build noise levels behind the existing sound barrier. In both Table 12 and Table 13, the future predicted unabated build year noise levels are shown in column two and noise level exceedances are shown in column three with levels at or above the impact thresholds shown in boldface face front. In addition, Figure 16 provides a graphical representation of the noise impact analysis findings presented in Table 12 and Table 13. A red dot indicates a projected future 2040 build noise level above the impact threshold and a green dot represents properties which are expected to remain below the impact threshold. A purple dot represents properties that will be acquired because of the proposed roadway widening improvements.

3.5.1 Noise Segment 5 SE: Lower Segment Noise Impact Findings

A summary of all the TNM noise level estimates in both directions under 2040 build peak hour traffic conditions is provided in Table 12 and Table 13. In the Noise Segment 5 SE study area projected 2040 build noise levels, above the impact threshold in the northbound direction, are projected to occur at seven properties: R13, R23, R32, R33, R53, R61 and R88. These impacts are illustrated graphically by red colored dots depicted in Figure 16 along northbound I-75. In the southbound direction, 30 receptor sites are projected to exceed the 66 dB(A) impact threshold behind the existing southbound sound barrier. The existing sound barrier is represented by the solid green line in Figure 16. The impact sites include single family residential properties, Maddock Park (R348) and Faith Christian Church (R351 & R352) and illustrate the poor noise reduction this existing wall provides under future 2040 build conditions.

Table 12 – Summary of Noise Segment 5 SE Predicted Future Build Noise Levels, [1] Impacts & Noise Reduction Achieved Levels for the Community Side Sound Barrier Design

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R4	Property Displacement	N/A	N/A
R5	61	No	2 (0)
R6	59	No	1 (0)
R7	58	No	1 (0)
R12	Property Displacement	N/A	N/A
R13	**69**	**Yes (1)**	**6 (1)**
R14	64	No	3 (0)
R15	61	No	2 (0)
R16	60	No	1 (0)
R17	59	No	1 (0)
R22	Property Displacement	N/A	N/A
R23	**68**	**Yes (1)**	**7 (1)**
R24	56	No	2 (0)
R25	59	No	3 (0)
R26	58	No	2 (0)
R27	58	No	2 (0)
R32	**72**	**Yes (1)**	**10 (1)**
R33	**66**	**Yes (1)**	**5 (1)**
R34	61	No	4 (0)
R35	58	No	2 (0)
R36	59	No	2 (0)
R37	58	No	1 (0)
R38	57	No	1 (0)
R44	Property Displacement	N/A	N/A
R45	65	No	**7 (1)**
R46	58	No	4 (0)
R47	57	No	3 (0)
R48	59	No	3 (0)
R49	57	No	4(0)
R50	57	No	3 (0)
R51	57	No	2 (0)
R52	Property Displacement	N/A	N/A
R53	**66**	**Yes (1)**	4 (0)
R54	62	No	3 (0)
R55	59	No	3 (0)

Table 12 – Summary of Noise Segment 5 SE Predicted Future Build Noise Levels, [1] Impacts & Noise Reduction Achieved Levels for the Community Side Sound Barrier Design (continued)

RECEPTOR ID	PREDICTED2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R56	59	No	4(0)
R57	58	No	2 (0)
R58	57	No	2 (0)
R59	57	No	2 (0)
R60	Property Displacement	N/A	N/A
R61	**66**	**Yes (1)**	**6 (1)**
R62	58	No	**5 (1)**
R63	59	No	3 (0)
R64	Property Displacement	N/A	N/A
R65	55	No	2 (0)
R66	55	No	2 (0)
R67	56	No	2 (0)
R69	Property Displacement	N/A	N/A
R70	62	No	**8 (1)**
R71	60	No	4 (0)
R72	56	No	4 (0)
R73	Property Displacement	N/A	N/A
R74	56	No	3 (0)
R75	56	No	3 (0)
R76	56	No	2 (0)
R78	Property Displacement	N/A	N/A
R79	59	No	2 (0)
R80	56	No	2 (0)
R81	56	No	1 (0)
R82	56	No	2 (0)
R83	56	No	2 (0)
R88	**67**	**Yes (1)**	4 (0)
R89	59	No	2 (0)
R90	Property Displacement	N/A	N/A
R91	58	No	2 (0)
R92	56	No	1 (0)
R93	Property Displacement	N/A	N/A
R94	57	No	1 (0)
R222	65	No	0 (0)
R223	62	No	0 (0)

Table 12 – Summary of Noise Segment 5 SE Predicted Future Build Noise Levels, [1] Impacts & Noise Reduction Achieved Levels for the Community Side Sound Barrier Design(continued)

RECEPTOR ID	PREDICTED2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R225	62	No	0 (0)
R226	63	No	0 (0)
R227	64	No	0 (0)
R228	61	No	0 (0)
R229	62	No	0 (0)
R230	63	No	0 (0)
R231	61	No	0 (0)
R232	61	No	0 (0)
R233	62	No	0 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**7**	**8[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2]Includes 3 non-impacted benefited receptors.

Table 13 – Summary of Noise Segment 5 SE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB2)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R305	**71**	**Yes (1)**	**5 (1)**
R306	**72**	**Yes (1)**	**5 (1)**
R308	**72**	**Yes (1)**	**5 (1)**
R309	60	No	4 (0)
R310	59	No	3 (0)
R311	58	No	3 (0)
R312	60	No	3 (0)
R313	**71**	**Yes (1)**	**5 (1)**
R314	**71**	**Yes (1)**	**5 (1)**
R315	**71**	**Yes (1)**	**5 (1)**
R316	**71**	**Yes (1)**	**5 (1)**
R317	**71**	**Yes (1)**	**5 (1)**
R318	58	No	3 (0)
R319	**71**	**Yes (1)**	**5 (1)**
R320	**71**	**Yes (1)**	**5 (1)**
R321	**71**	**Yes (1)**	**6 (1)**
R322	**71**	**Yes (1)**	**5 (1)**
R323	61	No	3 (0)
R324	58	No	2 (0)
R326	59	No	2 (0)
R327	58	No	4 (0)
R328	61	No	4 (0)
R329	59	No	3 (0)
R330	59	No	4 (0)
R329A	58	No	3 (0)
R330A	57	No	4 (0)
R338	**69**	**Yes (1)**	**6 (1)**
R339	58	No	3 (0)
R341	63	No	**6 (1)**
R342	59	No	4 (0)
R344	58	No	4 (0)
R345	**68**	**Yes (1)**	1 (0)
R347	**70**	**Yes (1)**	3 (0)
R348 Maddock Park	**67**	**Yes (11)**	4 (0)

Table 13 – Summary of Noise Segment 5 SE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB2) (continued)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R349 Playground	61	No	2 (0)
R351 Faith Christian	**66**	**Yes (2)**	4 (0)
R352 Faith Christian	**69**	**Yes (2)**	**7 (2)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**30**	**16[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2] Includes one non-impacted benefited receptor.

Figure 16 – Summary of Impacted Receivers Noise Segment 5 SE (Lower Section)

3.6 Noise Segment 5 NE: Noise Impact Analysis Findings

Table 14 provides a summary of the predicted future 2040 Build noise levels without abatement within the upper portion of the Noise Segment 5 NE study area in the northbound direction between Lincoln Drive and 11 Mile Road. Similarly, in the southbound direction, Table 15 provides a summary of the predicted future 2040 Build noise levels behind the existing sound barrier. The third column of both Table 14 and Table 15 identify which receptor sites are projected to be at or above the 66 dB(A) impact threshold (NAC Land Use Category B) as described in Table 1. In each table noise levels at or above the impact thresholds are depicted in boldface front. In addition, Figure 17 provides a graphical representation of the future Build Year 2040 impact analysis findings presented Table 14 and Table 15. A red dot indicates a projected future build noise exposure at or above the impact threshold and a green dot represents properties which are expected to remain below the impact threshold. A purple dot represents properties which are likely to be acquired due to the proposed roadway widening.

3.6.1 Noise Segment 5 NE: Upper Segment Noise Impact Findings

A summary of all the TNM predicted 2040 peak hour PM unabated noise level estimates at receptor sites in both directions under 2040 build peak hour traffic conditions is provided in Table 14 in the northbound direction and Table 15 in the southbound direction. The noise modeling analysis findings indicate that in the northbound direction, predicted 2040 build noise levels at or above the impact threshold are projected to occur at all first row and many second-row properties. In addition, a significant number of property takes are expected in the northbound direction due to the proposed roadway widening. As a result, many existing second-row properties under build design conditions will become first row properties and thus these homes will have a higher noise exposure because of the loss of first row shielding provided by the removed properties. A total of 59 impacts are predicted to occur at residential properties.

In the southbound direction, noise level exceedances are projected to occur at all first-row properties behind the existing southbound sound barrier, illustrated by the solid green line shown in Figure 17. A total of 40 impacts are predicted to occur at residential properties and three commercial properties approaching 11 Mile Road.

Table 14 – Summary of Noise Segment 5 NE Predicted Future Build Noise Levels[1], Impacts & Noise Reduction Levels Achieved With Barrier Design Option 2

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R99	**67**	**Yes (1)**	4
R100	63	No	1
R104	**71**	**Yes (1)**	4
R105	**71**	**Yes (1)**	4
R106	**71**	**Yes (1)**	**6 (1)**
R107	**70**	**Yes (1)**	**6 (1)**
R108	**70**	**Yes (1)**	**6 (1)**
R109	**70**	**Yes (1)**	**7 (1)**
R110	**70**	**Yes (1)**	**7 (1)**
R111	**70**	**Yes (1)**	**7 (1)**
R112	**69**	**Yes (1)**	**7 (1)**
R114	56	No	1
R115	61	No	3
R116	61	No	3
R117	60	No	3
R118	59	No	2
R119	58	No	2
R120	59	No	2
R121	59	No	2
R122	58	No	3
R123	59	No	3
R124	59	No	3
R125	Property Take	Property Take	Property Take
R126	Property Take	Property Take	Property Take
R127	Property Take	Property Take	Property Take
R128	Property Take	Property Take	Property Take
R129	Property Take	Property Take	Property Take
R131	**69**	**Yes (1)**	**8 (1)**
R132	**69**	**Yes (1)**	**8 (1)**
R133	**68**	**Yes (1)**	**7 (1)**
R134	**68**	**Yes (1)**	**7 (1)**
R135	**68**	**Yes (1)**	**7 (1)**
R136	**69**	**Yes (1)**	**8 (1)**
R138	**70**	**Yes (1)**	**6 (1)**
R139	**68**	**Yes (1)**	**7 (1)**

Table 14 – Summary of Noise Segment 5 NE Predicted Future Build Noise Levels[1], Impacts & Noise Reduction Levels Achieved With Barrier Design Option 2 (continued)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R140	**70**	**Yes (1)**	**6 (1)**
R141	**73**	**Yes (1)**	**7 (1)**
R142	**72**	**Yes (1)**	**8 (1)**
R143	**70**	**Yes (1)**	**7 (1)**
R144	**72**	**Yes (1)**	**7 (1)**
R145	**73**	**Yes (1)**	**7 (1)**
R146	**73**	**Yes (1)**	**7 (1)**
R147	**73**	**Yes (1)**	**7 (1)**
R150	63	No	**5 (1)**
R151	62	No	4
R152	62	No	4
R153	61	No	3
R154	60	No	2
R155	60	No	2
R156	61	No	3
R157	61	No	3
R158	64	No	4
R160	**78**	**Yes (1)**	**8 (1)**
R161	**77**	**Yes (1)**	**6 (1)**
R162	**77**	**Yes (1)**	**8 (1)**
R163	**74**	**Yes (1)**	**9 (1)**
R164	**76**	**Yes (1)**	**10 (1)**
R165	**76**	**Yes (1)**	**11 (1)**
R167	Property Take	Property Take	Property Take
R169	Property Take	Property Take	Property Take
R170	Property Take	Property Take	Property Take
R171	Property Take	Property Take	Property Take
R172	Property Take	Property Take	Property Take
R173	Property Take	Property Take	Property Take
R176	Property Take	Property Take	Property Take
R177	Property Take	Property Take	Property Take
R178	**73**	**Yes (1)**	**10 (1)**
R179	**73**	**Yes (1)**	**10 (1)**
R180	**74**	**Yes (1)**	**10 (1)**
R181	**74**	**Yes (1)**	**10 (1)**

Table 14 – Summary of Noise Segment 5 NE Predicted Future Build Noise Levels[1], Impacts & Noise Reduction Levels Achieved With Barrier Design Option 2 (continued)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R182	**75**	**Yes (1)**	**10 (1)**
R183	**71**	**Yes (1)**	**7 (1)**
R184	**70**	**Yes (1)**	**6 (1)**
R185	**67**	**Yes (1)**	**6 (1)**
R186	**67**	**Yes (1)**	**6 (1)**
R187	**68**	**Yes (1)**	**8 (1)**
R188	**66**	**Yes (1)**	**5 (1)**
R189	**66**	**Yes (1)**	**6 (1)**
R190	**72**	**Yes (1)**	**11 (1)**
R191	**72**	**Yes (1)**	**11 (1)**
R192	65	No	**6 (1)**
R193	64	No	4
R194	62	No	3
R195	64	No	**5 (1)**
R196	65	No	**7 (1)**
R197	64	No	**6 (1)**
R198	63	No	**5 (1)**
R199	Property Take	Property Take	Property Take
R200	Property Take	Property Take	Property Take
R201	**74**	**Yes (1)**	**10 (1)**
R202	**71**	**Yes (1)**	**9 (1)**
R203	**69**	**Yes (1)**	**8 (1)**
R204	**67**	**Yes (1)**	**7 (1)**
R205	**66**	**Yes (1)**	**6 (1)**
R206	64	No	**5 (1)**
R207	65	No	4
R208	**68**	**Yes (1)**	**5 (1)**
R209	**72**	**Yes (1)**	**9 (1)**
R210	**71**	**Yes (1)**	**9 (1)**
R211	**71**	**Yes (1)**	**9 (1)**
R212	**70**	**Yes (1)**	**8 (1)**
R213	**68**	**Yes (1)**	**8 (1)**
R214	**67**	**Yes (1)**	**7 (1)**
R215	**66**	**Yes (1)**	**7 (1)**
R216	65	No	**6 (1)**

Table 14 – Summary of Noise Segment 5 NE Predicted Future Build Noise Levels[1], Impacts & Noise Reduction Levels Achieved With Barrier Design Option 2 (continued)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R218	64	No	**5 (1)**
R219	63	No	4
R220	63	No	4
R235	65	No	0
R237	60	No	0
R239	62	No	0
R242	Property Take	Property Take	Property Take
R244	65	No	**5 (1)**
R303	64	No	**6 (1)**
R332	64	No	**6 (1)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**59**	**68[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.
[2]Includes 12 non-impacted benefited receptors.

Table 15 – Summary of Noise Segment 5 NE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB1)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R246	**79**	**Yes (1)**	1
R247	**79**	**Yes (1)**	3
R248	**79**	**Yes (1)**	**5 (1)**
R249	**79**	**Yes (1)**	**6 (1)**
R250	**79**	**Yes (1)**	**8 (1)**
R251	**79**	**Yes (1)**	**9 (1)**
R252	**79**	**Yes (1)**	**9 (1)**
R253	**79**	**Yes (1)**	**7 (1)**
R254	**79**	**Yes (1)**	**10 (1)**
R255	**79**	**Yes (1)**	**10 (1)**
R256	**79**	**Yes (1)**	**10 (1)**
R257	**79**	**Yes (1)**	**10 (1)**
R258	**79**	**Yes (1)**	**10 (1)**
R259	**67**	**Yes (1)**	0
R260	65	No	**5 (1)**
R260A	64	No	**6 (1)**
R261	64	No	**6 (1)**
R262	64	No	**7 (1)**
R263	64	No	**8 (1)**
R264	65	No	**7 (1)**
R265	**66**	**Yes (1)**	**7 (1)**
R266	**68**	**Yes (1)**	**9 (1)**
R268	65	No	**6 (1)**
R269	63	No	**6 (1)**
R270	59	No	**5 (1)**
R271	60	No	**5 (1)**
R272	62	No	**5 (1)**
R273	60	No	4
R274	62	No	**5 (1)**
R275	65	No	**7 (1)**
R276	**78**	**Yes (1)**	**10 (1)**
R277	**77**	**Yes (1)**	**10 (1)**
R278	**77**	**Yes (1)**	**9 (1)**
R279	**76**	**Yes (1)**	**9 (1)**

Table 15 – Summary of Noise Segment 5 NE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB1) (continued)

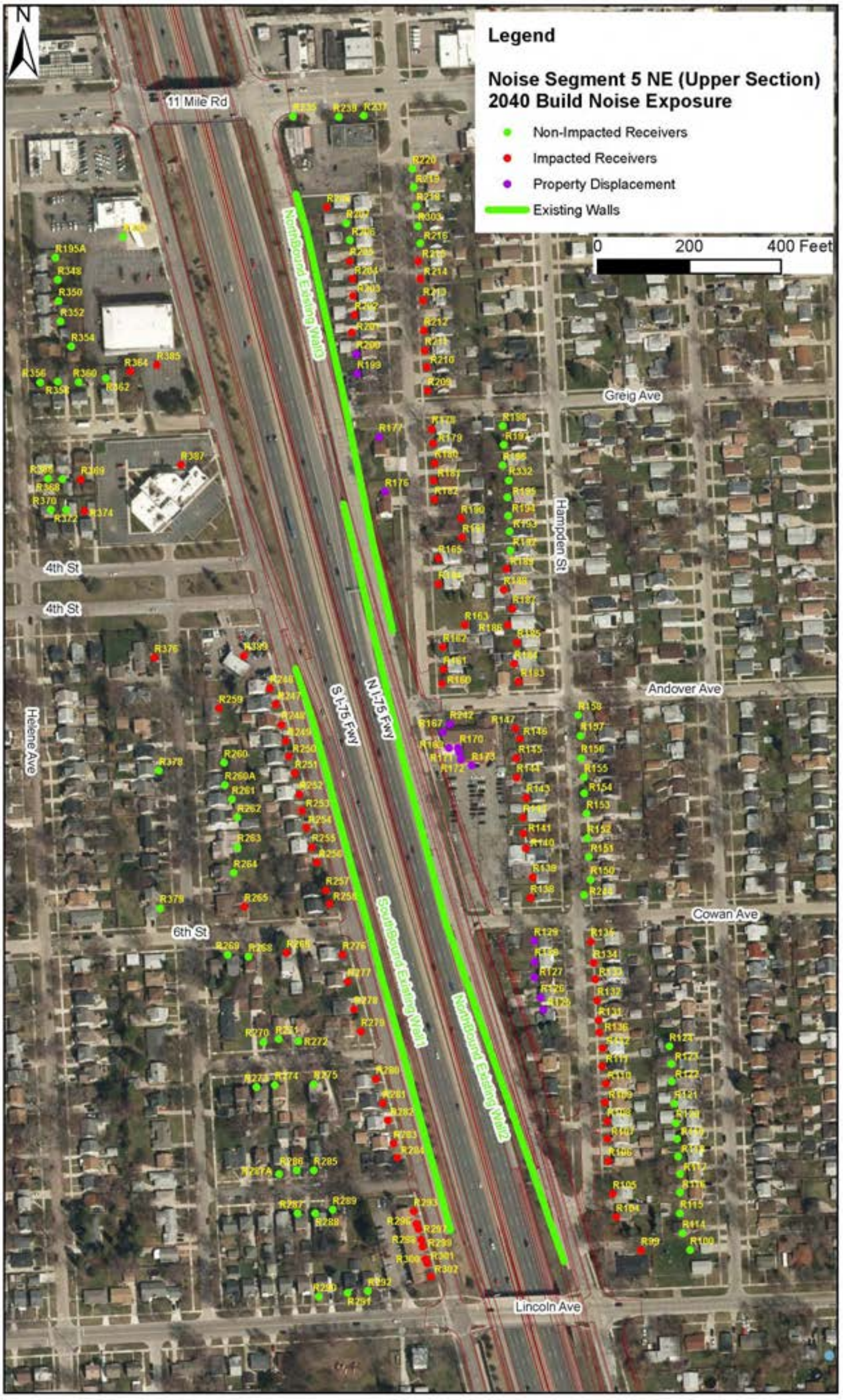
RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R280	**75**	**Yes (1)**	**7 (1)**
R281	**75**	**Yes (1)**	**7 (1)**
R282	**75**	**Yes (1)**	**7 (1)**
R283	**74**	**Yes (1)**	**7 (1)**
R284	**74**	**Yes (1)**	**7 (1)**
R285	60	No	4
R286	58	No	4
R287	59	No	4
R288	62	No	**5 (1)**
R289	63	No	**5 (1)**
R290	58	No	0
R291	60	No	1
R292	61	No	1
R293	**74**	**Yes (1)**	**6 (1)**
R296	**74**	**Yes (1)**	**5 (1)**
R297	**74**	**Yes (1)**	**5 (1)**
R298	**74**	**Yes (1)**	**5 (1)**
R299	**74**	**Yes (1)**	4
R300	**73**	**Yes (1)**	4
R301	**73**	**Yes (1)**	4
R302	**73**	**Yes (1)**	3
R195A	62	No	0
R348	62	No	0
R350	61	No	0
R352	60	No	0
R354	62	No	0
R356	59	No	0
R358	60	No	0
R360	61	No	0
R362	64	No	0
R364	**71**	**Yes (1)**	0
R366	63	No	1
R368	64	No	1
R369	**66**	**Yes (1)**	0

Table 15 – Summary of Noise Segment 5 NE Predicted Future Unabated Build Noise Levels[1], Projected Impacts & Noise Reduction Levels Achieved With Southbound Replacement Barrier (SB1) (continued)

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R370	61	No	0
R372	63	No	0
R374	**67**	**Yes (1)**	0
R376	**69**	**Yes (1)**	0
R378	63	No	1
R379	59	No	2
R287A	58	No	4
R383 (Commercial)	70	No	0
R385	**74**	**Yes (1)**	0
R387	**73**	**Yes (1)**	0
R389	**77**	**Yes (1)**	1
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**40**	**41[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.
[2] Includes 15 non-impacted benefited receptor.

Figure 17 – Summary of Impacted Receivers Noise Segment 5 NE (Upper Section)



3.7 Noise Segment 5A: Noise Impact Analysis Findings

A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1 with each TNM receiver site representing a single or multiple dwelling receptor sites. Noise predictions for properties located behind replacement Northbound Sound Barrier NB1 and Northbound Sound Barrier NB2 are presented in Table 16. Similarly, noise predictions for modeling sites behind Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2 are presented in Table 17 and Table 18 respectively.

All receivers behind the Northbound Sound Barrier NB1 consist of single family residents and those behind Northbound Sound Barrier NB2 consist of both single-family properties and multi-family apartment units. In the southbound direction, the receivers behind the Southbound Sound Barriers SB1 and SB2 are all single-family properties. The first column of Table 16 through Table 18 identifies the TNM modeling receiver sites; column two provides an estimate of the TNM predicted unabated 2040 Build Year noise levels with impacted levels shown in bold font and the number of dwelling impacts shown in parenthesis. Lastly, column four indicates the noise reduction level achieved with the number of benefitting dwelling units shown in parenthesis.

Figure 18 provides a graphical representation of each of the modeled TNM receiver site and their projected relative noise exposure versus the MDOT impacted criteria. A red dot in Figure 18 indicates a projected noise impact and a green dot represents a location that will remain below the impact threshold.

In general, the noise analysis findings indicate in the northbound direction, all first-row sites and many second properties are predicted to exceed the 66 dB(A) impact threshold. Conversely, in the southbound direction, noise impacts generally do not go beyond the first-row residential properties. In the northbound direction, a total of 114 TNM modeling locations were evaluated with noise impacts projected at 83 total dwellings under future 2040 build traffic conditions. Similarly, in the southbound direction, a total of 111 TNM receivers site were modeled with future Build Year 2040 impacts predicted at 99 dwellings behind proposed sound barrier SB1 and at 11 dwellings behind proposed sound barrier SB2. The impact analysis findings indicate that new replacement sound walls are needed. The recommended abatement measures are described in Chapter 4.

Table 16 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Combined Northbound Replacement Sound Barrier NB1 and NB2

TNM RECE IVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R1 (Commercial Land Use)	**70**	No	2 (0)
R3 (Commercial Land Use)	**70**	No	0
R4 (Commercial Land Use)	**69**	No	0
R5 (Commercial Land Use)	**68**	No	0
R6 (Commercial Land Use)	**68**	No	0
R7 (Commercial Land Use)	**68**	No	0
R8	**68**	**Yes (1)**	4 (0)
R9	63	No	2 (0)
R10	59	No	2 (0)
R11	57	No	2 (0)
R12	**73**	**Yes (1)**	**8 (1)**
R13	63	No	4 (0)
R14	61	No	4 (0)
R15	60	No	3 (0)
R16	59	No	3 (0)
R17	**73**	**Yes (1)**	**8 (1)**
R18	58	No	4 (0)
R19	60	No	4 (0)
R20	60	No	4 (0)
R21	61	No	4 (0)
R22	63	No	**5 (1)**
R23	65	No	**5 (1)**
R24	**68**	**Yes (1)**	**6 (1)**
R25	**70**	**Yes (1)**	**8 (1)**
R26	**69**	**Yes (1)**	**8 (1)**
R27	**67**	**Yes (1)**	**8 (1)**
R28	65	No	**7 (1)**
R29	63	No	**6 (1)**
R30	62	No	**6 (1)**
R31	61	No	4 (0)
R32	61	No	**5 (1)**
R33	**78**	**Yes (1)**	**9 (1)**

Table 16 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Combined Northbound Replacement Sound Barrier NB1 and NB2 (continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R34	**71**	**Yes (1)**	**9 (1)**
R35	**68**	**Yes (1)**	**8 (1)**
R36	65	No	**7 (1)**
R37	64	No	**7 (1)**
R38	63	No	**6 (1)**
R39	63	No	**6 (1)**
R40	61	No	4 (0)
R42	**78**	**Yes (1)**	**6 (1)**
R43	**74**	**Yes (1)**	**7 (1)**
R44	**72**	**Yes (1)**	**10 (1)**
R45	**69**	**Yes (1)**	**9 (1)**
R46	**68**	**Yes (1)**	**9 (1)**
R47	**66**	**Yes (1)**	**6 (1)**
R48	65	No	**8 (1)**
R49	63	No	**6 (1)**
R50	**75**	**Yes (1)**	**10 (1)**
R51	**71**	**Yes (1)**	**10 (1)**
R52	**69**	**Yes (1)**	**9 (1)**
R53	**67**	**Yes (1)**	**9 (1)**
R54	**66**	**Yes (1)**	**8 (1)**
R55	64	No	**7 (1)**
R56	63	No	**7 (1)**
R57	**78**	**Yes (1)**	2 (0)
R58	**73**	**Yes (1)**	2 (0)
R59	**72**	**Yes (1)**	4 (0)
R60	**70**	**Yes (1)**	4 (0)
R61	**68**	**Yes (1)**	**5 (1)**
R62	**66**	**Yes (1)**	**5 (1)**
R63	65	No	**5 (1)**
R64	64	No	**5 (1)**
R65	63	No	4 (0)

Table 16 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Combined Northbound Replacement Sound Barrier NB1 and NB2 (continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R66	**78**	**Yes (1)**	**6 (1)**
R67	**74**	**Yes (1)**	4 (0)
R68	**71**	**Yes (1)**	4 (0)
R69	**70**	**Yes (1)**	4 (0)
R70	**68**	**Yes (1)**	4 (0)
R71	**67**	**Yes (1)**	3 (0)
R72	65	No	3 (0)
R73	64	No	3 (0)
R74	64	No	3 (0)
R159	**73**	**Yes (4)**	**9 (4)**
R160	**79**	**Yes (4)**	**10 (4)**
R161	**78**	**Yes (4)**	**11 (4)**
R162	**74**	**Yes (4)**	**11 (4)**
R167	**74**	**Yes (4)**	**11 (4)**
R168	**79**	**Yes (4)**	**11 (4)**
R169	**80**	**Yes (4)**	**11 (4)**
R170	**70**	**Yes (4)**	**8 (4)**
R191	65	No	**6 (4)**
R192	60	No	**6 (4)**
R193	56	No	3
R194	**67**	**Yes (4)**	**10 (4)**
R195	**68**	**Yes (4)**	**10 (4)**
R196	58	No	**6 (4)**
R197	62	No	**7 (4)**
R198	61	No	**5 (4)**
R200	62	No	4 (0)
R201	**71**	**Yes (1)**	**6 (1)**
R202	**72**	**Yes (1)**	**6 (1)**
R203	**67**	**Yes (1)**	**7 (1)**
R204	64	No	4 (0)
R205	**67**	**Yes (1)**	**5 (1)**

Table 16 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Combined Northbound Replacement Sound Barrier NB1 and NB2 (continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R206	64	No	4 (0)
R207	64	No	3 (0)
R208	**68**	**Yes (1)**	3 (0)
R209	**69**	**Yes (1)**	4 (0)
R210	**67**	**Yes (1)**	**7 (1)**
R211	**66**	**Yes (1)**	**8 (1)**
R212	65	No	**7 (1)**
R213	**66**	**Yes (1)**	**8 (1)**
R214	64	No	**6 (1)**
R215	61	No	**5 (1)**
R216	59	No	3 (0)
R217	56	No	1 (0)
R218	57	No	2 (0)
R219	58	No	1 (0)
R220	59	No	1 (0)
R221	61	No	1 (0)
R222	62	No	0
R319	58	No	2(0)
R321	64	No	**6 (1)**
R213A	**66**	**Yes (1)**	**5 (1)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**83**	**111[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2]Includes 40 non-impacted benefited receptors.

Table 17 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Proposed Existing Replacement Sound Barrier SB1

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R223	**72**	**Yes (4)**	2 (0)
R225	**72**	**Yes (4)**	3(0)
R226	**71**	**Yes (4)**	**5 (4)**
R227	**71**	**Yes (4)**	**6 (4)**
R228	**72**	**Yes (4)**	**6 (4)**
R229	**72**	**Yes (4)**	**6 (4)**
R230	**72**	**Yes (4)**	**7 (4)**
R231	**72**	**Yes (4)**	**7 (4)**
R232	**74**	**Yes (4)**	**8 (4)**
R233	**74**	**Yes (4)**	**8 (4)**
R235	**74**	**Yes (4)**	**9 (4)**
R237	**77**	**Yes (4)**	**11 (4)**
R238	**77**	**Yes (4)**	**12 (4)**
R239	**79**	**Yes (4)**	**12 (4)**
R240	**71**	**Yes (4)**	**12 (4)**
R241	**70**	**Yes (4)**	**12 (4)**
R242	**79**	**Yes (4)**	**12 (4)**
R243	**77**	**Yes (4)**	**12 (4)**
R246	**77**	**Yes (4)**	**12 (4)**
R247	**79**	**Yes (1)**	**12 (1)**
R248	**79**	**Yes (1)**	**12 (1)**
R249	**79**	**Yes (1)**	**12 (1)**
R250	**79**	**Yes (1)**	**12 (1)**
R251	**79**	**Yes (1)**	**12 (1)**
R252	**79**	**Yes (1)**	**12 (1)**
R253	**79**	**Yes (1)**	**12 (1)**
R254	**79**	**Yes (1)**	**12 (1)**
R255	**79**	**Yes (1)**	**12 (1)**
R256	**79**	**Yes (1)**	**12 (1)**
R257	**79**	**Yes (1)**	**11 (1)**
R258	**79**	**Yes (1)**	**11 (1)**
R259	**79**	**Yes (1)**	**8 (1)**
R260	**79**	**Yes (1)**	**6 (1)**
R261	**79**	**Yes (1)**	4 (0)

Table 17 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Proposed Existing Replacement Sound Barrier SB1 (continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R262	**78**	**Yes (1)**	2 (0)
R263	**78**	**Yes (1)**	1 (0)
R271	63	**No**	0
R272	64	**No**	**8 (1)**
R274	55	**No**	1 (0)
R275	60	**No**	**5 (1)**
R276	55	**No**	3 (0)
R277	56	**No**	2 (0)
R278	54	**No**	1 (0)
R279	55	**No**	1 (0)
R280	61	**No**	0
R281	57	**No**	1 (0)
R282	54	**No**	1 (0)
R283	56	**No**	3 (0)
R284	54	**No**	1 (0)
R285	58	**No**	**5 (1)**
R286	62	**No**	**7 (1)**
R287	61	**No**	**5 (1)**
R288	59	**No**	4 (0)
R289	64	**No**	**8 (1)**
R290	63	**No**	**8 (1)**
R291	57	**No**	3 (0)
R292	60	**No**	**5 (1)**
R293	65	**No**	**8 (1)**
R294	65	**No**	**8 (1)**
R295	64	**No**	**7 (1)**
R296	64	**No**	**7 (1)**
R297	63	**No**	**6 (1)**
R298	**66**	**Yes (1)**	**8 (1)**
R299	**68**	**Yes (1)**	**6 (1)**

Table 17 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Levels & Noise Reduction with Abatement[1] Adjacent to Southbound Proposed Existing Replacement Sound Barrier SB1 (continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R300	**68**	**Yes (1)**	**10 (1)**
R301	**66**	**Yes (1)**	**9 (1)**
R302	64	**No**	**8 (1)**
R306	63	**No**	**7 (1)**
R307	65	**No**	**5 (1)**
R308	**67**	**Yes (1)**	2 (0)
R309	**66**	**Yes (1)**	4 (0)
R311	64	**No**	3 (0)
R300A	64	**No**	**6 (1)**
R301A	64	**No**	**8 (1)**
R311A	62	**No**	3 (0)
R309A	62	**No**	4 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**99**	**104[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

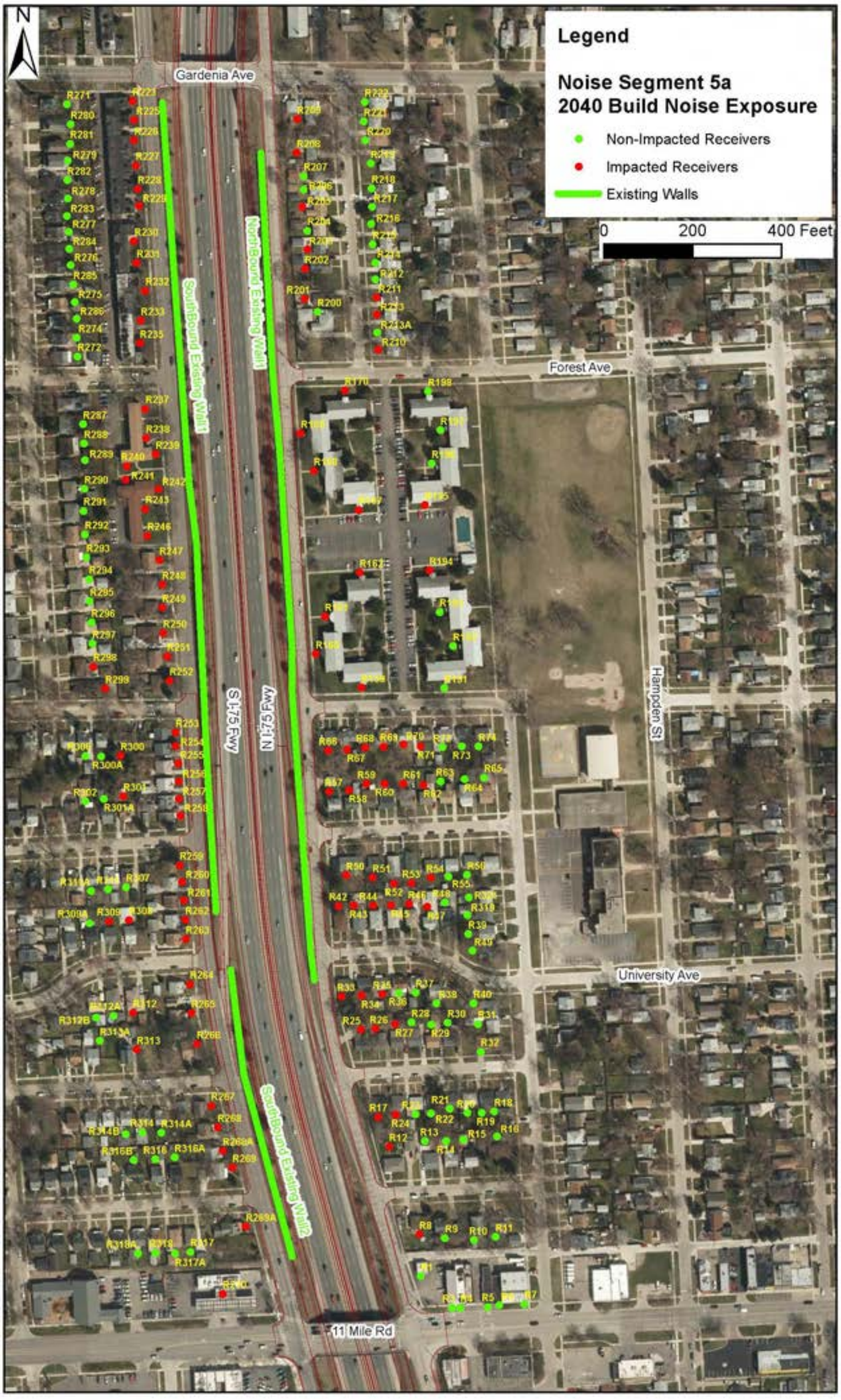
[2]Includes 18 non-impacted benefited receptors.

Table 18 – Summary of Noise Segment 5A Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to Southbound Replacement Sound Barrier SB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R264	**78**	**Yes (1)**	3 (0)
R265	**77**	**Yes (1)**	4 (0)
R266	**76**	**Yes (1)**	**5 (1)**
R267	**74**	**Yes (1)**	**6 (1)**
R268	**74**	**Yes (1)**	**6 (1)**
R269	**73**	**Yes (1)**	**7 (1)**
R270	**66**	**Yes (1)**	0
R312	**67**	**Yes (1)**	**6 (1)**
R313	**67**	**Yes (1)**	**8 (1)**
R314	59	No	4 (0)
R316	61	No	2 (0)
R317	61	No	2 (0)
R318	61	No	1 (0)
R313A	63	No	4 (0)
R312A	65	No	**7 (1)**
R312B	63	No	**7 (1)**
R314A	62	No	**6 (1)**
R314B	59	No	3 (0)
R268A	**73**	**Yes (1)**	**7 (1)**
R269A	**72**	**Yes (1)**	**6 (1)**
R316A	62	No	3 (0)
R316B	58	No	4 (0)
R317A	61	No	1 (0)
R318A	61	No	1 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**11**	**11[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.
[2]Includes 3 non-impacted benefited receptors.

Figure 18 – Summary of Noise Segment 5A Projected 2040 Build Year Impacted Receivers



3.8 Noise Segment 6: Noise Impact Analysis Findings

A summary of the Noise Segment 6 Build noise levels projected under future 2040 Build Year traffic conditions is provided in Table 19 for all TNM modeling sites adjacent to I-75 in the northbound direction. Table 20 and Table 21 for all TNM modeling sites adjacent to I-75 in the southbound direction. A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1. Each TNM receiver site can either represent a single unit or multiple dwelling units. Noise predictions for modeling sites located behind Northbound Sound Barrier NB1 are summarized in Table 19. Noise predictions for receptor sites located behind Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2 are provided in Table 20 and Table 21 respectively. Receivers behind sound barriers NB1 and SB1 consist mainly of primary single family residential properties and receivers behind sound barrier SB2 consist of multi-family apartment units. Column one in each table identifies the TNM modeling receiver sites, column two provides the TNM predicted unabated Build Year 2040 noise level estimates with projected levels at or above the impact threshold shown in bold font and with the number of dwelling impacts shown in parenthesis. Column four indicates the noise reduction level achieved with abatement and the number of benefitting dwellings shown in parenthesis.

Figure 19 provides a graphical representation of each of the modeled TNM receiver sites and their projected relative noise exposure versus the MDOT impacted threshold expected under future build conditions. A red dot in Figure 19 indicates a noise impact and a green dot represents a TNM receiver location projected to remain below the 66 dB(A) impact threshold.

In general, in both directions, the noise analysis findings indicate that future 2040 Build Year noise level estimates above the 66 dB(A) impact threshold are limited mostly to the first-row receiver sites. As indicated in Table 19 in the northbound direction, a total of 54 TNM modeling locations were evaluated and impacts are projected to occur at 24 residential dwellings. Behind 2005 ROD approved Southbound Sound Barrier SB1 a total of 29 TNM receivers were modeled with impacts predicted at 16 dwellings. Similarly, adjacent to the proposed Southbound Sound Barrier SB2, a total of 7 TNM modeling receivers were evaluated representing 24 residential dwellings.

Table 19 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barrier NB1

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R1	**77**	**Yes (1)**	**8 (1)**
R3	**66**	**Yes (1)**	**7 (1)**
R4	**67**	**Yes (1)**	**9 (1)**
R5	**67**	**Yes (1)**	**8 (1)**
R6	**70**	**Yes (1)**	**9 (1)**
R7	**68**	**Yes (1)**	**7 (1)**
R8	65	No	**7 (1)**
R9	64	No	**6 (1)**
R10	61	No	**5 (1)**
R11	61	No	**5 (1)**
R12	61	No	**5 (1)**
R13	61	No	**6 (1)**
R14	62	No	3
R16	59	No	2
R17	59	No	2
R18	60	No	2
R19	60	No	2
R20	60	No	1
R21	60	No	0
R22	62	No	0
R75	**71**	**Yes (1)**	**10 (1)**
R76	**67**	**Yes (1)**	**9 (1)**
R77	60	No	2
R78	58	No	1
R79	58	No	3
R80	**72**	**Yes (1)**	**11 (1)**
R81	**71**	**Yes (1)**	**10 (1)**
R82	**67**	**Yes (1)**	**7 (1)**
R83	**66**	**Yes (1)**	**7(1)**
R84	64	No	**8 (1)**

Table 19 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to North-bound Barrier NB1 (Continued)

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R86	**69**	**Yes (1)**	**10 (1)**
R88	61	No	**6 (1)**
R89	62	No	**6 (1)**
R95	58	No	1
R96	57	No	1
R97	59	No	1
R99	60	No	2
R100	60	No	2
R101	60	No	2
R102	59	No	1
R104	61	No	**6 (1)**
R106	64	No	**7 (1)**
R107	63	No	**7 (1)**
R108	61	No	**5 (1)**
R191	52	No	1
R192	58	No	2
R194	58	No	1
R195	59	No	1
R197	62	No	1
R198	65	No	1
R200	**67**	**Yes (1)**	1
R201	**73**	**Yes (10)**	0
R108A	60	No	4
R108B	59	No	3
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**24**	**26[2]**

Notes: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.
[2]Includes 13 non-impacted benefits.

Table 20 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to South-bound Barrier SB1

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R23	**73**	**Yes (1)**	**8 (1)**
R24	**68**	**Yes (1)**	**7 (1)**
R25	64	No	**5 (1)**
R26	**70**	**Yes (1)**	**8 (1)**
R27	**66**	**Yes (1)**	**8 (1)**
R28	**71**	**Yes (1)**	**8 (1)**
R29	**66**	**Yes (1)**	**7 (1)**
R30	**70**	**Yes (1)**	**7 (1)**
R31	**69**	**Yes (1)**	**8 (1)**
R32	63	No	**7 (2)**
R33	**69**	**Yes (1)**	**6(1)**
R34	**66**	**Yes (1)**	**7 (1)**
R61	63	No	**7 (1)**
R62	62	No	**6 (1)**
R63	NA	NA	NA
R64	NA	NA	NA
R65	NA	NA	NA
R66	NA	NA	NA
R67	**69**	**Yes (1)**	**6 (1)**
R68	**69**	**Yes (1)**	**6 (1)**
R69	**68**	**Yes (1)**	**6 (1)**
R70	**67**	**Yes (1)**	**6 (1)**
R71	64	No	**5(1)**
R72	65	No	**6 (1)**
R73	**69**	**Yes (1)**	**7 (1)**
R61A	65	No	**7 (1)**
R27A	63	No	**7 (1)**
R30A	63	No	**6 (3)**
R25A	**67**	**Yes (1)**	**5 (1)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**16**	**28[2]**

Notes: [1] All noise level and noise reduction estimates shown are rounded to nearest whole number.

[2] Includes 12 non-impacted benefits.

Table 21 – Summary of Noise Segment 6 Predicted 2040 Future Build Unabated Noise Level & Noise Reduction with Abatement[1] Adjacent to South-bound Barrier SB2

TNM RECEIVER ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT YES or NO (NUMBER OF IMPACTS)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R39	**70**	**Yes (12)**	**7 (12)**
R40	**72**	**Yes (2)**	**9 (2)**
R55	**72**	**Yes (2)**	**8 (2)**
R56	**71**	**Yes (2)**	**8 (2)**
R57	**72**	**Yes (2)**	**9 (2)**
R58	**71**	**Yes (2)**	**7 (2)**
R59	**73**	**Yes (2)**	**5 (2)**
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**24**	**24**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

Figure 19 – Summary of Noise Segment 6 Projected 2040 Build Year Impacted Receivers

3.9 Noise Segment 6A: Noise Impact Analysis Findings

A single TNM receiver site is a discrete or representative exterior modeling location of sensitive properties for any of the land uses listed in Table 1 with each TNM receiver site representing a single or multiple dwelling receptor site.

Columns one and two in Table 22 and Table 23 provides receptor identification and future unabated 2040 noise prediction level information. The third column of both Table 22 and Table 23 identify which receptor sites are projected to approach or exceed the 66 dB(A) impact threshold (NAC Land Use Category B) with the number of impacted dwellings shown in parenthesis. Predicted future 2040 build noise levels above the 66 dB(A) impact threshold is shown in boldface font text in each table. In addition, Figure 20 provides a graphical representation of the properties which are projected to see noise levels above the impacted threshold. A red dot in Figure 20 indicate a projected future 2040 build noise level above the 66 dB(A) impact level and a green dot represents a location which is expected to remain below impact threshold. Predicted noise level exceedances are projected to occur at 12 out of the 19 modeled receiver's locations identified as: R109, R110, R112-R114, R117-R120 and R122-R124.

Table 22 – Summary of Noise Segment 6A Shoulder Analysis Predicted Future Build Unabated Noise Levels & Noise Reduction Achieved[1] with Abatement

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R109	**74**	**Yes (1)**	**6 (1)**
R110	**67**	**Yes (1)**	3 (0)
R111	65	No	2 (0)
R112	**70**	**Yes (1)**	**8 (1)**
R113	**70**	**Yes (1)**	**8 (1)**
R114	**67**	**Yes (1)**	**6 (1)**
R115	65	No	**5 (1)**
R116	58	No	2 (0)
R117	**75**	**Yes (1)**	**10 (1)**
R118	**72**	**Yes (1)**	**9 (1)**
R119	**69**	**Yes (1)**	**7 (1)**
R120	**66**	**Yes (1)**	**5 (1)**
R211	59	No	3 (0)
R122	**72**	**Yes (1)**	**9 (1)**
R223	**69**	**Yes (1)**	**5 (1)**
R224	**66**	**Yes (1)**	4 (0)
R255	64	No	2 (0)
R226	60	No	2 (0)
R227	58	No	3 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**12**	**11[2]**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

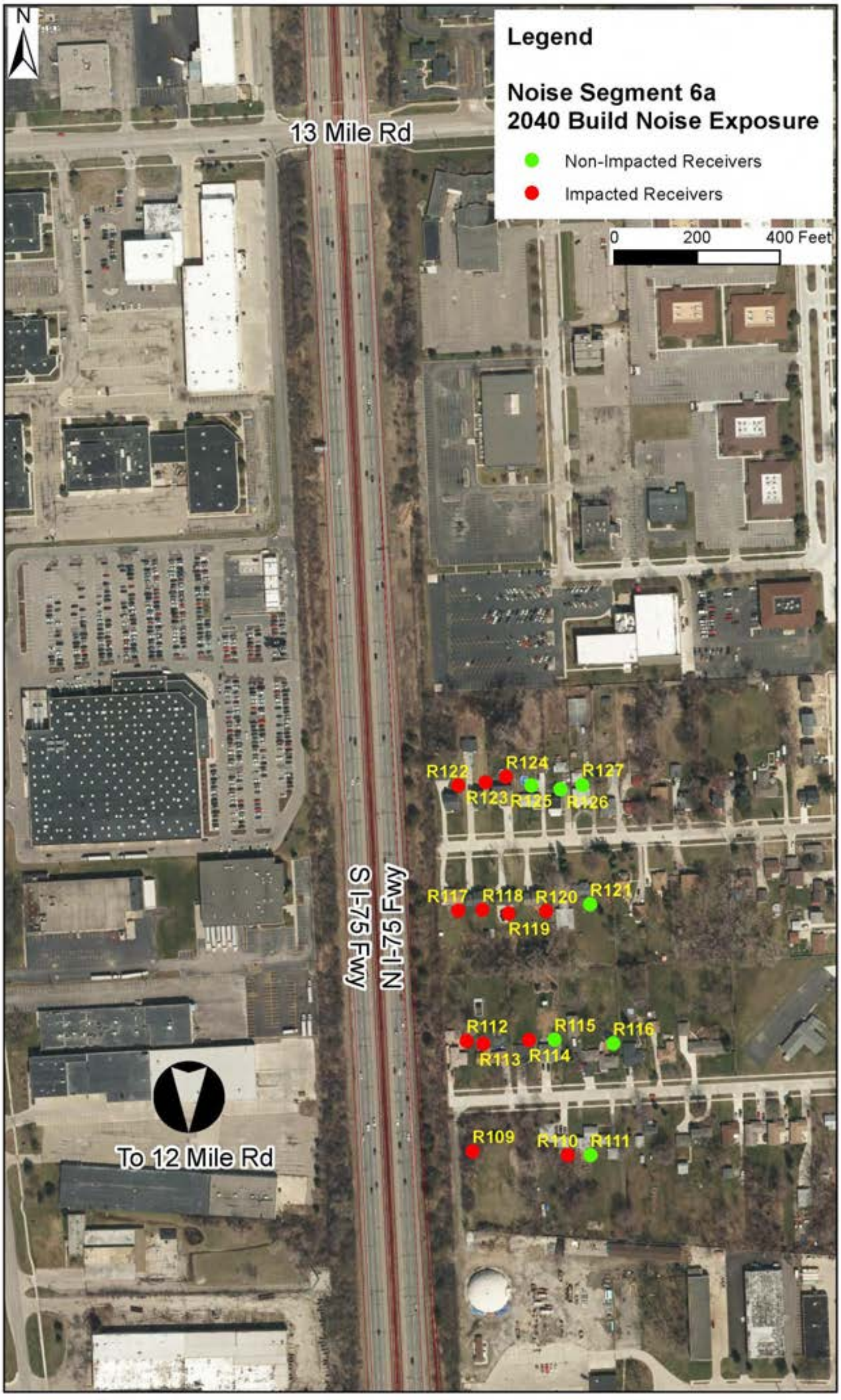
[2]Includes one non-impacted benefited receptors.

Table 23 – Summary of Noise Segment 6A Right-of-Way Analysis Predicted Future Build Unabated Noise Levels & Noise Reduction Achieved[1] with Abatement

RECEPTOR ID	PREDICTED 2040 UNABATED BUILD NOISE LEVEL L_{eq} (1 HR) dB(A)	MDOT/FHWA IMPACT (YES/NO)	NOISE REDUCTION ACHIEVED WITH ABATEMENT (NUMBER OF BENEFITS)
R109	**74**	**Yes (1)**	**7 (1)**
R110	**67**	**Yes (1)**	2 (0)
R111	65	No	1 (0)
R112	**70**	**Yes (1)**	**8 (1)**
R113	**70**	**Yes (1)**	**7 (1)**
R114	**67**	**Yes (1)**	**5 (1)**
R115	65	No	4 (0)
R116	58	No	1 (0)
R117	**75**	**Yes (1)**	**10 (1)**
R118	**72**	**Yes (1)**	**8 (1)**
R119	**69**	**Yes (1)**	**6 (1)**
R120	**66**	**Yes (1)**	4 (0)
R211	59	No	1 (0)
R122	**72**	**Yes (1)**	**8 (1)**
R223	**69**	**Yes (1)**	**5 (1)**
R224	**66**	**Yes (1)**	3 (0)
R255	64	No	1 (0)
R226	60	No	0 (0)
R227	58	No	1 (0)
TOTAL NUMBER OF RECEPTOR IMPACTS & BENEFITS		**12**	**9**

Note: [1]All noise level and noise reduction estimates shown are rounded to nearest whole number.

Figure 20 – Summary of Noise Segment 6A Projected 2040 Build Impacted Receivers



4.0 FUTURE 2040 BUILD CONDITIONS WITH ABATEMENT

4.1 Noise Segment 1: Noise Abatement Findings

The present impact and abatement TNM analysis was completed using the current highway design plans. A total of three 2005 ROD approved sound barriers are within the Noise Segment 1 study area with one in the southbound direction and two extending northbound. Plus, one additional sound barrier was identified in the southbound direction. The four sound barriers are depicted in Figure 21. In the northbound direction, the two proposed sound barriers are identified as Northbound Sound Barrier NB1 and Northbound Barrier NB2. Similarly, in the southbound direction the two proposed sound barriers are identified as Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2. Southbound Sound Barrier SB2 represents a new proposed wall location and is considered an extension to ROD approved SB1.

In the present 2040 Build Year analysis, barrier heights were optimized in one-foot heights and barrier segments were modeled up to a maximum of 100-foot length increments. Barrier wall terminus locations were determined to achieve the best possible noise reduction at the last impacted property near the wall terminus point. In addition, all sound barrier configurations included a line-of-site evaluation to ensure first row ground level residences were fully shielded from viewing the highway. The details of the 2040 analysis findings are described below.

A summary of the noise reduction levels achieved and the number of benefitting dwellings for each modeled TNM receiver is shown in the far-right hand column of Table 2 for the two northbound sound barriers and Table 3 for the two southbound sound barriers. In both tables, the number of dwelling benefits is shown in parenthesis and impacted receptors which achieve the minimum 5 decibels or more noise reduction is shown in bold font. Behind the two combined northbound barriers (NB1 & NB2) there were a total of 38 total benefits and behind the two combined southbound barriers (SB1 & SB2) there were 48 total benefits.

A summary of the feasibility and reasonableness of the two proposed northbound sound barriers is provided in Table 24. The combined two northbound sound barriers are recommended as per the 2005 ROD findings. In the present 2040 Build Year study, the two northbound sound barriers were optimized to achieve the highest possible noise reduction at the best reasonable cost. The combined barriers satisfy MDOT reasonableness requirements when non-impacted benefits are included in the acoustic effectiveness analysis. Twelve non-impacted benefits were found behind the two northbound barriers which consist of 2,248 combined total linear feet of sound wall at an average height of 15.7 feet providing abatement to 38 total benefitting dwellings resulting in a CPBU estimate of $41,795. The total cost of the two northbound sound barriers is approximately $1.6 million dollars. Noise reduction of 5 dB(A) or more is realized at 81% of the impacted receptors and a 7 dB(A) minimum reduction is achieved at 24% of all benefiting receptors. The two northbound barriers are recommended as per the 2005 ROD. The sound barrier height and barrier stationing location data in 50 to 100-foot increments are provided in the report Appendix A tables.

Figure 21 – Noise Segment 1 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barriers NB1 & NB2 and Southbound Barriers SB1 & SB2

Table 24 – Feasibility and Reasonableness Assessment
Noise Segment 1 Behind Proposed Northbound Sound Barriers NB1 & NB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No, but Walls recommended as per ROD [(2)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(2)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	32
# of Impacted Receptors with 5 dB(A) Noise Reduction	26
# of Impacted and Non-Impacted Benefiting Receptors with 5 dB(A) Noise Reduction	38
% of Impacted Receptors with 5 dB(A)Noise Reduction	81%
# of Impacted and Non-Impacted Benefiting Receptors with 7 dB(A) Noise Reduction	9
% of Impacted and non-impacted Benefiting Receptors with 7 dB(A) Noise Reduction	24%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,588,212
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$41,795
Total Length (feet)	2,248 ft.
Average Height (feet)	15.7 ft.
Total Square Footage	35,294 ft.^{2}

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
[(2)] Sound barrier(s) recommended based on 2005 Record of Decision (ROD).

A summary of the feasibility and reasonableness of the two southbound sound barriers is provided in Table 25. Southbound Sound Barrier SB1 is a 2005 ROD approved sound barrier. Southbound Sound Barrier SB2 is considered an extension to Sound Barrier 1 and together they provide abatement to the entire area. In the present 2040 Build Year study, the two southbound sound barriers were optimized to achieve the best possible noise reduction at a reasonable cost. The two combined barriers satisfy the MDOT reasonableness requirements when non-impacted benefits are included in the acoustic effectiveness analysis. A total of 48 benefits were found behind the two combined southbound barriers which consist of 2,179 combined total linear feet of sound wall at an average height of 15.2 feet resulting in a CPBU of $31,051. The total cost of the two sound barriers is approximately $1.5 million dollars. Noise reduction of 5 dB(A) or more is realized at 96% of the impacted receptors and a 7 dB(A) minimum reduction is achieved at 35% of all benefiting receptors. The two combined southbound sound barriers

remain approved as per the 2005 ROD recommendations. The sound barrier height and barrier stationing location in 50 to 100-foot increments are provided in the report Appendix A tables.

Table 25 – Feasibility and Reasonableness Assessment
Noise Segment 1 Behind Proposed Southbound Sound Barriers SB1 & SB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No, but Walls recommended as per ROD [(2)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(2)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	23
# of Impacted Receptors with 5 dB(A) Noise Reduction	22
# of Impacted and Non-Impacted Benefiting Receptors with 5 dB(A) Noise Reduction	48
% of Impacted Receptors with 5 dB(A)Noise Reduction	96%
# of Impacted and Non-Impacted Benefiting Receptors with 7 dB(A) Noise Reduction	17
% of Impacted and non-impacted Benefiting Receptors with 7 dB(A) Noise Reduction	35%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,490,445
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$31,051
Total Length (feet)	2,179 ft.
Average Height (feet)	15.2 ft.
Total Square Footage	33,121 ft.^{2}

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
[(2)] Sound barrier(s) recommended based on 2005 Record of Decision (ROD).

4.1.1 Statement of Likelihood

MDOT intends to construct highway traffic noise abatement in the form of sound barriers listed in Table 24 and Table 25 and illustrated by the red and blue dashed lines in Figure 21. The indications of likely abatement measures are based on the current design for noise barrier costs and noise reduction as reported in Chapter 4 of this report. If it subsequently develops during the final design that these conditions have substantially changed, the abatement measures may not be provided based on additional analysis.

4.2 Noise Segment 2: Noise Abatement Findings

The present impact and abatement TNM analysis was completed using the current highway design plans. A total of four sound barriers were identified within the Noise Segment 2 study area; two sound barriers were identified adjacent to the northbound lanes and two adjacent to the southbound lanes. Each barrier was optimized for height, length and noise reduction. The four sound barriers are depicted in Figure 22. In the northbound direction, the two proposed sound barriers are identified as Northbound Sound Barrier NB1 and Northbound Sound Barrier NB2. The two northbound sound barriers were recommended as part of the 2005 ROD. In the southbound direction, the two proposed sound barriers are identified as Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2. In all cases, the sound barrier terminus point was evaluated to achieve the best possible noise reduction at the last impacted property near the end of each wall. Furthermore, barrier heights were optimized in one-foot increments and barrier segments were modeled up to a maximum of 100-foot length segments. In addition, all sound barrier configurations included a line-of-site evaluation to ensure first row residences were fully shielded from viewing the highway. The details of the 2040 abatement analysis findings are described below.

A summary of the noise reduction levels achieved and the number of benefitting dwellings for each modeled TNM receiver is shown in the far-right hand column of Table 4 for the two northbound sound barriers and Table 5 for the two southbound sound barriers. The number of dwelling benefits is shown in parenthesis and impacted receptors which achieve the minimum 5 decibels or more noise reduction is shown in bold font. Under present proposed build design, a total of 38 dwelling impacts are projected in the area behind the two combined northbound barriers NB1 and NB2 and a total of 27 dwelling impacts were identified in the community behind the two proposed southbound barriers SB1 and SB2.

A summary of the feasibility and reasonableness of the two proposed northbound sound barriers is provided in Table 26. The combined barriers satisfy MDOT reasonableness cost requirements. The two northbound barriers consist of 2,712 combined total linear feet of sound wall at an average height of 14.1 feet providing abatement to 38 benefiting dwellings resulting in an overall CPBU of $45,283. The total cost of the two sound barriers is estimated to be approximately $1.7 million dollars. Overall, noise reduction of 5 dB(A) or more is realized at 71% of the impacted receptors and a 7 dB(A) or greater noise reduction is achieved at 21% of all benefiting receptors. As a result of these findings, the two northbound barriers remain recommended as per the 2005 ROD findings and they were optimized to achieve the best possible noise reduction at reasonable cost. The sound barrier height and barrier stationing location in 50 to 100-foot increments are provided in the report Appendix B tables.

Figure 22 – Noise Segment 2 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barriers NB1 & NB2 and Southbound Barriers SB1 & SB2

Table 26 – Feasibility and Reasonableness Assessment
Noise Segment 2 Behind Proposed Northbound Sound Barriers NB1 & NB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [1]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No, but Walls recommended as per ROD [2]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No, but Walls are recommended as per ROD [2]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [2]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [2]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	38
# of Impacted Receptors with 5 dB(A) Noise Reduction	27
# of Impacted and Non-Impacted Benefiting Receptors with 5 dB(A) Noise Reduction	38
% of Impacted Receptors with 5 dB(A)Noise Reduction	71%
# of Impacted and Non-Impacted Benefiting Receptors with 7 dB(A) Noise Reduction	8
% of Impacted and Non-Impacted Benefiting Receptors with 7 dB(A) Noise Reduction	21%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,720,755
Cost Per Benefitting Receptor Unit (CPBU in dollars) includes non-impacted benefits	$45,283
Total Length (feet)	2,712 ft.
Average Height (feet)	14.1 ft.
Total Square Footage	38,239 ft.^{2}

[1] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

[2] Sound barrier(s) recommended based on 2005 Record of Decision (ROD).

A summary of the feasibility and reasonableness of the two proposed southbound sound barriers is provided in Table 27. The two combined southbound barriers are not 2005 ROD approved walls and they do not satisfy MDOT reasonableness requirements necessary to be considered further. The two southbound barriers consist of 2,369 combined total linear feet of sound wall at an average height of 12.6 feet providing abatement to only 14 total benefitting dwellings out of 27 projected impacts. The CPBU is estimated to be $95,943 which is significantly higher than the $46,967 maximum limit. The total combined cost of SB1 and SB2 is estimated to be approximately $1.35 million dollars. Noise reduction of 5 dB(A) or more is realized at 44% of the impacted receptors and a 7 dB(A) or greater reduction at 50% of the benefiting receptors. Because of these findings, the two proposed southbound sound barriers are not recommended. The sound barrier height and barrier stationing location in 50 to 100-foot increments are provided in the report Appendix B tables.

Table 27 – Feasibility and Reasonableness Assessment
Noise Segment 2 Behind Proposed Southbound Sound Barriers SB1 & SB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	27
# of Impacted Receptors with 5 dB(A) Noise Reduction	12
# of Impacted and Non-Impacted Benefiting Receptors with 5 dB(A) Noise Reduction	14
% of Impacted Receptors with 5 dB(A)Noise Reduction	44%
# of Impacted and Non-Impacted Benefiting Receptors with 7 dB(A) Noise Reduction	7
% of Impacted and Non-Impacted Benefiting Receptors with 7 dB(A) Noise Reduction	50%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,343,205
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$95,943
Total Length (feet)	2,369 ft.
Average Height (feet)	12.6 ft.
Total Square Footage	29,849 ft.^{2}

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.2.1 Statement of Likelihood

MDOT intends to construct highway traffic noise abatement in the form of sound barriers listed in Table 26 and as depicted by the red and blue dashed lines in Figure 22 based on the noise analyses completed. The indications of likely abatement measures are based on the current design for noise barrier costs and noise reduction as reported in Chapter 4 of this report. If it subsequently develops during the final design that these conditions have substantially changed, the abatement measures may not be provided based on additional analysis.

4.3 Noise Segment 3: Noise Abatement Findings

The present impact and abatement TNM analysis was completed using the current highway design plans. A total of three sound barriers were identified within the Noise Segment 3 study area, one sound barrier was identified adjacent to the northbound lanes and two adjacent to the southbound lanes of I-75. Each barrier was optimized for height, length and noise reduction. The three sound barriers are depicted in Figure 23. In the northbound direction, the proposed sound barrier is identified as Northbound Sound Barrier NB1 and in the southbound direction the two proposed barriers are defined as Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2. Sound barrier SB2 represents a new proposed wall location that was not considered in any previous study of this corridor.

In all cases, barrier wall terminus locations were evaluated to achieve the best possible noise reduction at the last impacted property near the end of each sound barrier. In addition, all sound barrier configurations included a line-of-site evaluation to ensure first row residences were fully shielded from viewing the highway. The details of the 2040 noise abatement analysis findings are described below.

A summary of the noise reduction levels achieved and the number benefitting dwellings for each modeled TNM receiver is shown in the far-right hand column of Table 6 for the Northbound Sound Barrier NB1 and Table 7 for benefits of proposed Southbound Sound Barrier SB1 and Table 8 for Southbound Sound Barrier SB2. In each table, the number of benefitted dwelling units is shown in parenthesis and the numbers of impacted and non-impacted receptors which achieve the minimum 5 decibel noise reduction benefit are shown in bold font. A total of 48 benefited dwelling units were identified behind proposed Northbound Sound Barrier NB1. In the southbound direction, a total of 48 benefited dwelling units behind 2005 ROD approved Southbound Sound Barrier SB1 and 6 benefits were identified behind proposed Southbound Sound Barrier SB2. Northbound Sound Barrier NB1 and Southbound Sound Barrier SB2 are new proposed barriers and are therefore are evaluated against MDOT's current noise abatement policy criteria.

A summary of the feasibility and reasonableness for the proposed Northbound Sound Barrier NB1 is provided in Table 28. The proposed Northbound Sound Barrier NB1 satisfies MDOT reasonableness requirements necessary to be recommended. Northbound Sound Barrier NB1 consists of 1,690 linear feet of sound wall at an average height of 13.9 feet providing abatement to 48 total benefitting dwellings which includes 7 non-impacted benefits. The CPBU is estimated to be approximately $22,000

per benefit which is well below the $46,967 maximum allowable limit. The total cost of proposed NB1 is nearly $1.1 million dollars. Noise reduction of 5 dB(A) or more is realized at 91% of the impacted receptors and a 7 dB(A) minimum reduction is achieved at 50% of all benefiting receptors. In addition, a noise reduction of 10 dB(A) or more is achieved at one dwelling. As a result of these analysis findings, Northbound Sound Barrier NB1 is recommended. The sound barrier height and barrier stationing location in 50 to 100-foot increments are provided in the report Appendix C tables.

Figure 23 – Noise Segment 3 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barrier NB1 and Southbound Barriers SB1 & SB2

Table 28 – Feasibility and Reasonableness Assessment
Noise Segment 3 Behind Proposed Northbound Sound Barrier NB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes (1)
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes (1)
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes (1)
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes (1)
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase (1)
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	46
# of Impacted Receptors with 5 dB(A) Noise Reduction	42
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	48
% of Impacted Receptors with 5 dB(A)Noise Reduction	91%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	24
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	50%
# of Impacted Receptors with 10 dB(A)Noise Reduction	1
Total Cost (dollars)	$1,057,095
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$22,941
Total Length (feet)	1,690 ft.
Average Height (feet)	13.9 ft.
Total Square Footage	23,491ft.^{2}

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

Proposed Southbound Sound Barrier SB1 is a 2005 ROD approved sound barrier and therefore is was optimized to achieve adequate noise reduction under projected 2040 Build Year traffic conditions. A summary of the abatement analysis findings is provided in Table 29. Proposed Southbound Sound Barrier SB1 consists of 1,630 linear feet of sound wall at an average height of 14.7 feet providing abatement to 47 benefitting dwellings which includes 20 non-impacted benefits resulting in a CPBU of $22,941. The total cost of Southbound Sound Barrier SB1 is approximately $1.1 million dollars. Noise reduction of 5 dB(A) or more is realized at 96% of the impacted receptors and a minimum noise reduction a 7 dB(A) is achieved at 69% of the benefiting receptors and 12 dwellings achieved a noise reduction of 10 dB(A) or more. As a result of these findings, 2005 ROD approved Southbound Sound Barrier SB1 remains recommended. The sound barrier height and barrier stationing locations in 50 to 100-foot increments are provided in the report Appendix C tables.

Table 29 – Feasibility and Reasonableness Assessment
Noise Segment 3 Behind Proposed Southbound Sound Barrier SB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes, wall recommended as per ROD [(2)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(2)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	28
# of Impacted Receptors with 5 dB(A) Noise Reduction	27
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	47
% of Impacted Receptors with 5 dB(A)Noise Reduction	96%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	33
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	69%
# of Impacted Receptors with 10 dB(A)Noise Reduction	12
Total Cost (dollars)	$1,078,245
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$22,941
Total Length (feet)	1,630 ft.
Average Height (feet)	14.7
Total Square Footage	23,961 ft.^{2}

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
[(2)] Sound barrier(s) recommended based on 2005 Record of Decision (ROD).

Proposed Southbound Sound Barrier SB2 was not a 2005 ROD recommended sound barrier and therefore to be considered as a new recommended wall it must satisfy the 2011 MDOT feasibility and reasonableness requirements. A summary of abatement analysis findings for proposed Southbound Sound Barrier SB2 is provided in Table 30. The results indicate that Southbound Sound Barrier SB2 does not satisfy the MDOT reasonableness requirements. Southbound Sound Barrier SB2 consist of 750 linear feet with an average height of 19 feet providing abatement to only 6 benefitting dwellings resulting in a CPBU more than $100,000 per benefit which is more than double the $46,967 maximum allowable limit. The total cost of Southbound Sound Barrier SB2 barrier is approximately $641,250 dollars. Noise reduction of 5 dB(A) or more is realized at 83% of the impacted receptors, but a 7 dB(A) minimum reduction is achieved at one dwelling (17%). Due to these results, Southbound Sound Barrier SB2 is not

recommended. The sound barrier height and barrier stationing locations in 50 to 100-foot increments are provided in the report Appendix C tables.

Table 30 – Feasibility and Reasonableness Assessment
Noise Segment 3 Behind Proposed Southbound Sound Barrier SB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	6
# of Impacted Receptors with 5 dB(A) Noise Reduction	5
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	6
% of Impacted Receptors with 5 dB(A)Noise Reduction	83%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	1
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	17%
# of Impacted Receptors with 10 dB(A) Noise Reduction	0
Total Cost (dollars)	$641,250
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$106,875
Total Length (feet)	750 ft.
Average Height (feet)	19.0 ft.
Total Square Footage	14,250 ft.^{2}

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.3.1 Statement of Likelihood

MDOT intends to construct highway traffic noise abatement in the form of sound barriers as described in Table 29 and as depicted by the solid blue and red and blue dashed lines depicted in Figure 23 based on all the noise analyses completed. The indications of likely abatement measures are based on the current design for noise barrier costs and noise reduction as reported in Chapter 4 of this report. If it subsequently develops during the final design that these conditions have substantially changed, the abatement measures not be provided based on additional analysis.

4.4 Noise Segment 4: Noise Abatement Findings

The impact and abatement TNM analysis was completed using the current highway design plans. A total of three sound barriers were identified within the Noise Segment 4 study area: one sound barrier identified adjacent to the northbound lane which was recommended in the 2005 ROD and two new wall locations adjacent to the southbound lanes of I-75. The three sound barriers are depicted in Figure 24. In the northbound direction, the wall is identified as Northbound Sound Barrier NB1+NB2. In the present study, NB1+NB2 is extended slightly further north from the previous evaluated location to mitigate new residential noise impacts found in this area. In the southbound direction, as indicated in Figure 24, two proposed sound barriers were evaluated and are identified as Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2.

In the present 2040 Build Year analysis, barrier heights were optimized in one-foot height increments and barrier segments were modeled in 50 to 100-foot length segments. Barrier wall terminus locations were evaluated to achieve the best possible noise reduction at the last impacted property near the end of each wall. In addition, all sound barrier configurations included a line-of-site evaluation to ensure first row residences were fully shielded from viewing the highway. The details of the 2040 analysis findings are described below.

A summary of the noise reduction levels achieved and the number of benefitting dwellings for each modeled TNM receiver is shown in the far-right hand column of Table 9 for the Northbound Sound Barrier NB1+NB2 and Table 10 and Table 11 for the two Southbound Sound Barriers SB1 and SB2 (2A+2B+2C). The number of dwelling benefits is shown in parenthesis and receptors which achieve the minimum 5 decibel noise reduction are shown in bold font. A total of 14 dwelling benefits were identified behind barrier NB1+NB2, no dwelling benefits were identified behind barrier SB1, and 52 dwelling benefits were identified behind barrier SB2.

A summary of the feasibility and reasonableness for the Northbound Sound Barrier NB1+NB2 is provided in Table 31. As depicted in Figure 24, the proposed Northbound Sound Barrier consists of two smaller barrier segments that are evaluated for feasibility and reasonableness as one sound wall. Noise reduction of 5 dB(A) or more is realized at 12 of the impacted properties (86%). The 2005 ROD approved barrier consists of 1,416 total linear feet of sound wall at an average height of 13.8 feet providing abatement to 14 total benefitting dwellings with an estimated CPBU of $62,810. The total cost of NB1+NB2 is estimated to be $879,336 and no receptor achieved a noise reduction of 7 dB(A) or more. Because of engineering limitations associated with the highway design and to maintain property access, Sound Barrier NB1+NB2 could not be extended to provide abatement to the Landmark Community Church and therefore it is not included in the impact, feasibility and reasonableness analysis shown in Table 31. However, interior noise levels inside the church are projected to remain below the 51-dB(A) impact threshold assuming the standard 25 dB window attenuation. The 2005 ROD approved Sound Barrier NB1+NB2 has been optimized to achieve the best possible noise reduction under Build Year 2040 peak hour traffic projections. Sound Barrier NB1+NB2 remains recommended. The sound barrier height and barrier stationing location data points in 50 to 100-foot increments are provided in the report Appendix D tables.

Figure 24 – Noise Segment 4 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barrier NB1+NB2 and Southbound Barriers SB1 & SB2 (2A, 2B & 2C)

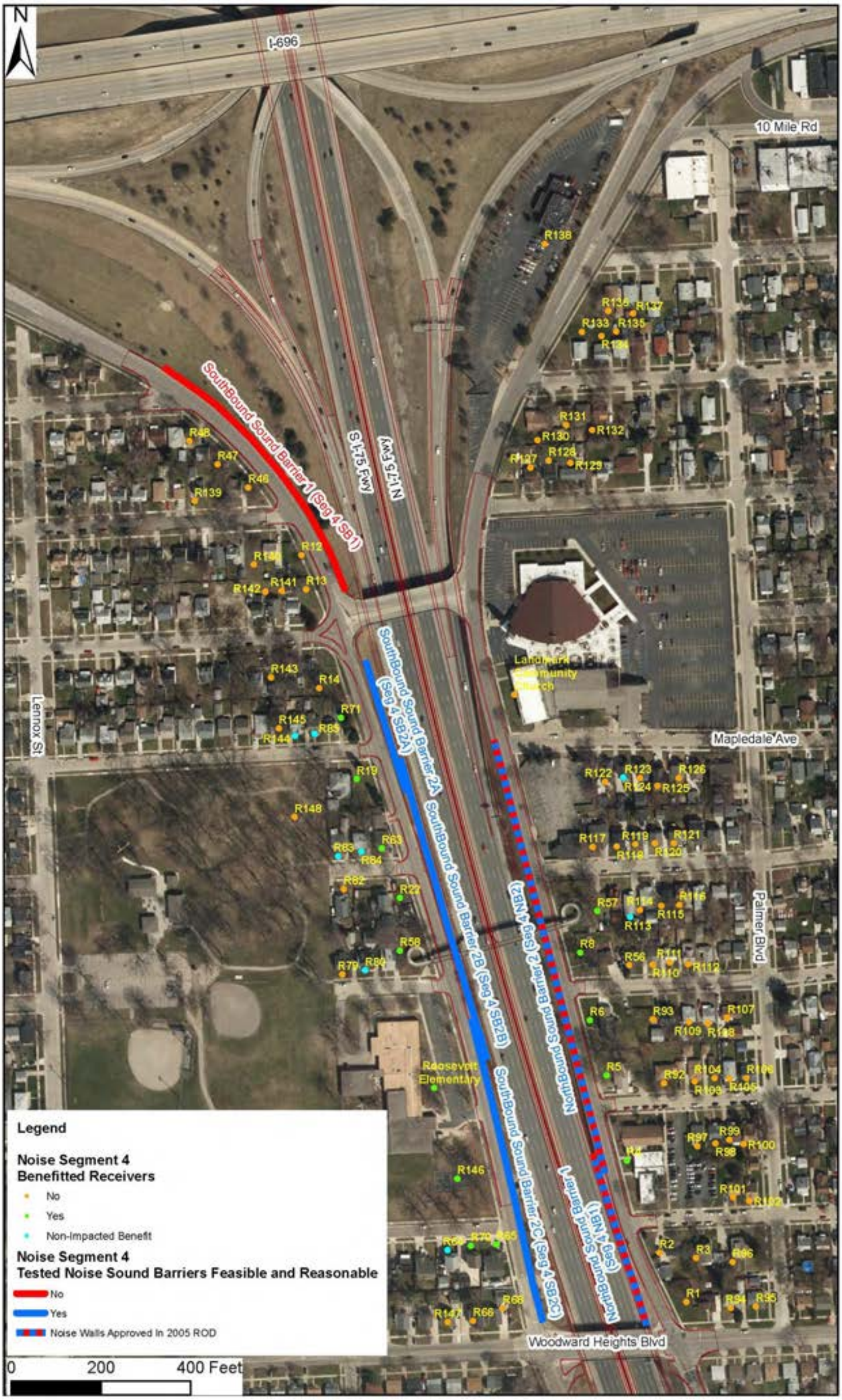


Table 31 – Feasibility and Reasonableness Assessment
Noise Segment 4 Behind Proposed Northbound Sound Barrier NB1+NB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No, but Walls recommended as per ROD [(2)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No, but Walls recommended as per ROD [(2)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(2)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	14[(3)]
# of Impacted Receptors with 5 dB(A) Noise Reduction	12
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	14
% of Impacted Receptors with 5 dB(A)Noise Reduction	86%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	0
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	0%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$879,336
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$62,810
Total Length (feet)	1,416 ft.
Average Height (feet)	13.8 ft.
Total Square Footage	19,541 ft^2

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
[(2)] Sound barrier(s) recommended based on 2005 Record of Decision (ROD).
[(3)] Does not include the 29 impacts identified at the Landmark Community Church because this proposed abatement measure cannot be extended to include the church. However, interior noise levels at the church are expected to remain below the NAC D interior noise impact approach level.

A summary of the feasibility and reasonableness of Southbound Sound Barrier SB1 is provided in Table 32. This proposed sound barrier consists of 666 total linear feet of sound wall at an average height of 20 feet, but was found to not provide abatement to any benefiting dwellings. Because of these results, Southbound Sound Barrier SB1 is not recommended. The sound barrier height and barrier stationing location data points for proposed SB1 in 50 to 100-foot increments are provided in the report Appendix D tables.

Table 32 – Feasibility and Reasonableness Assessment
Noise Segment 4 Behind Proposed Southbound Sound Barrier SB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	2
# of Impacted Receptors with 5 dB(A) Noise Reduction	0
% of Impacted Receptors with 5 dB(A)Noise Reduction	0%
# of Impacted Receptors with 7 dB(A) Noise Reduction	0
% of Impacted Receptors with 7 dB(A) Noise Reduction	0%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$599,400
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$599,400
Total Length (feet)	666 ft.
Average Height (feet)	20.0 ft.
Total Square Footage	13,320 ft^2

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

A summary of the feasibility and reasonableness for the proposed Southbound Sound Barrier SB2 is provided in Table 33. As depicted in Figure 24, proposed Southbound Sound Barrier SB2 consists of three smaller segments identified as SB2A, SB2B and SB2C, which are evaluated for feasibility and reasonableness as one sound wall. Apart from not achieving a 10 dB(A) noise reduction at one receptor, sound barrier SB2 satisfies the MDOT feasibility and reasonableness requirements. A noise reduction of 5 dB(A) or more is realized at 96% of the impacted receptors and a 7 dB(A) minimum reduction is achieved at 77% of the benefiting receptors. Southbound Sound Barrier SB2 consists of 1,706 total linear feet of sound wall at an average height of 13.3 feet providing abatement to 52 total benefitting dwellings including 6 non-impacted benefits. The estimated construction cost of Southbound Sound Barrier SB2 is approximately $1 million dollars and the CPBU is estimated at $19,636 per benefit which is well below the $46,967 maximum allowable limit. Based on these findings, Southbound Sound Barrier SB2 is recommended. The sound barrier height and barrier stationing data point locations in 50 to 100-foot increments are provided in the report Appendix D tables.

Table 33 – Feasibility and Reasonableness Assessment
Noise Segment 4 Behind Proposed Southbound Sound Barrier SB2 (2A+2B+2C)

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes (1)
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes1)
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes 1)
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes (1)
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase (1)
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	48
# of Impacted Receptors with 5 dB(A) Noise Reduction	46
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	52
% of Impacted Receptors with 5 dB(A)Noise Reduction	96%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	40
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	77%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,021,050
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$19,636
Total Length (feet)	1,706 ft.
Average Height (feet)	13.3 ft.
Total Square Footage	22,690 ft^2

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.4.1 Statement of Likelihood

The MDOT intends to construct highway traffic noise abatement as described Table 31 and Table 33 and as depicted by the solid blue and blue and red dashed line in Figure 24 based on all the noise analyses completed. The indications of likely abatement measures are based on the current design for noise barrier costs and noise reduction as reported in Chapter 4 of this report. If it subsequently develops during the final design that these conditions have substantially changed, the abatement measures may not be provided based on additional analysis.

4.5 Noise Segment 5: Noise Abatement

As part of MDOT's 2005 ROD commitments within this corridor, existing sound barriers in the northbound direction need to be removed due to the proposed highway widening improvements and,

as a result will be replaced with new sound barriers. Therefore, the original focus of the Noise Segment 5 analysis was for evaluating replacement northbound sound barrier design configurations from I-696 Interchange to 11 Mile Road study area segments. However, the TNM noise modeling analysis in the southbound direction has shown that noise levels at most first row properties behind the existing wall that were to remain are above the impact threshold. The southbound walls throughout the Noise Segment 5 study area are unaffected by the roadway improvements and are not part of the 2005 ROD commitments. Therefore, the existing southbound sound barriers from I-696 Interchange to 11 Mile Road study were assessed for feasibility and reasonableness with taller replacement sound barriers. For the most part, the proposed southbound replacement sound barriers were analyzed in their approximate current location. In addition, the end points of each proposed sound barrier were designed to minimize sound flanking around the end of the wall to the last benefited receptor. Therefore, sound barriers in both directions were evaluated. Due to the complexity of the roadway geometry the Noise Segment 5 study area, the noise analysis was broken down into two smaller study areas identified as Noise Segment 5 SE and Noise Segment 5 NE.

4.6 Noise Segment 5 SE: Noise Abatement Findings

The lower portion of Noise Segment 5 SE which extends from I-696 at its southern terminus to Lincoln Drive at its northern limit. The original 2016 analysis evaluated four proposed sound barrier design configurations. This report documents the final selected design option, referred to as “Option 4”. Information pertaining to the abatement findings for the previous proposed sound barrier design is contained in the 2016 from I-696 Interchange to 11 Mile Road study report. All northbound proposed sound barriers from I-696 Interchange to 11 Mile Road area were recommended as part of the 2005 ROD findings. A summary of the cost and acoustic effectiveness of the 2005 ROD approved and existing southbound replacement sound barriers are discussed in the subsection below.

4.6.1 Option 4: Full Street Access Community Side Sound Barrier Design

The overall noise abatement goal within the Noise Segment 5 SE study area is to design replacement northbound sound barriers that provide adequate noise reduction to the adjacent residential properties and to evaluate and assess potential southbound replacement sound barriers. However, because they are not affected by the roadway geometric improvements, the proposed southbound replacement sound barrier needed to satisfy all MDOT feasibility and reasonableness requirements to be recommended for construction. In addition, all abatement measures, sound barrier lengths and heights were optimized to achieve 5 dB(A) or more reduction in noise for as many benefiting dwellings as possible while attempting to keep the unit cost per benefit below MDOT’s $46,967 maximum limit.

Figure 25 depicts the proposed Option 4 sound barrier design configuration, within Noise Segment 5 SE section. The proposed Option 4 barrier design maintains complete street access to Stephenson Highway Service Drive. The five sound barriers segments are identified as Northbound NB1 through NB5 as depicted in Figure 25. Each barrier segment is positioned at the ROW boundary between the Service Drive and the first-row of residential properties. The noise impact assessment, within the lower segment of the study area, found that under the future 2040 build traffic conditions, noise exposure for most of

the residential properties adjacent to the northbound direction, will remain below the impact threshold. This is mainly due to the new proposed I-75 highway design which incorporates several additional retaining walls and other shielding type elements within this area. In addition, the present proposed build design includes acquiring some first-row residential properties which creates a larger buffer zone to the present second and third row properties. Noise impacts are projected to occur at seven residential properties identified as receptors R13, R23, R32, R33, R53, R61 and R88. These locations are identified by the bold face text in the second column of Table 12. Additionally, the extreme right column in Table 12 provides a summary of the noise reduction level achieved at each individual receptor site and includes the number of benefits shown in parenthesis. Noise reduction levels projected at impacted properties under the final barrier design range from 4 dB(A) at R53 to 10 dB(A) at R32. Impacted receptors which achieve a 5 dB(A) minimum benefit are shown by a green dot on Figure 25 and non-impacted benefitted receptors are shown by a light blue dot. Additionally, a purple dot represents a property displacement and an orange dot represents a receiver location which fails to achieve the minimum 5 dB(A) noise reduction. A summary of the feasibility and reasonableness of the final design sound barrier design configuration is presented in Table 34. The 2005 ROD approved sound barriers segments provide abatement to a total of 8 benefiting single family homes consisting of 3 non-impacted properties and 5 impacted properties. Each of these properties would experience a minimum noise reduction of 5 dB(A) or more. The total combined length of the five sound barrier segments is 1,259 feet at an average height of 13.9 feet. The total cost of the final barrier design is approximately $787,500 resulting in an CPBU of $98,438. This barrier design allows complete street and emergency access to Stephenson Highway Service Drive and provides adequate noise reduction at most impacted properties.

As a result of these analysis, the final northbound sound barrier design remains recommended as per the 2005 ROD findings. Each sound barrier segment was optimized to achieve the best possible noise reduction at reasonable cost. The sound barrier height and barrier stationing location are provided in the Appendix Tables E-1 through E-5.

Figure 25 –Noise Segment 5 SE (Lower Section) Option 4 Sound Barrier Design Configuration Benefitting Receptors

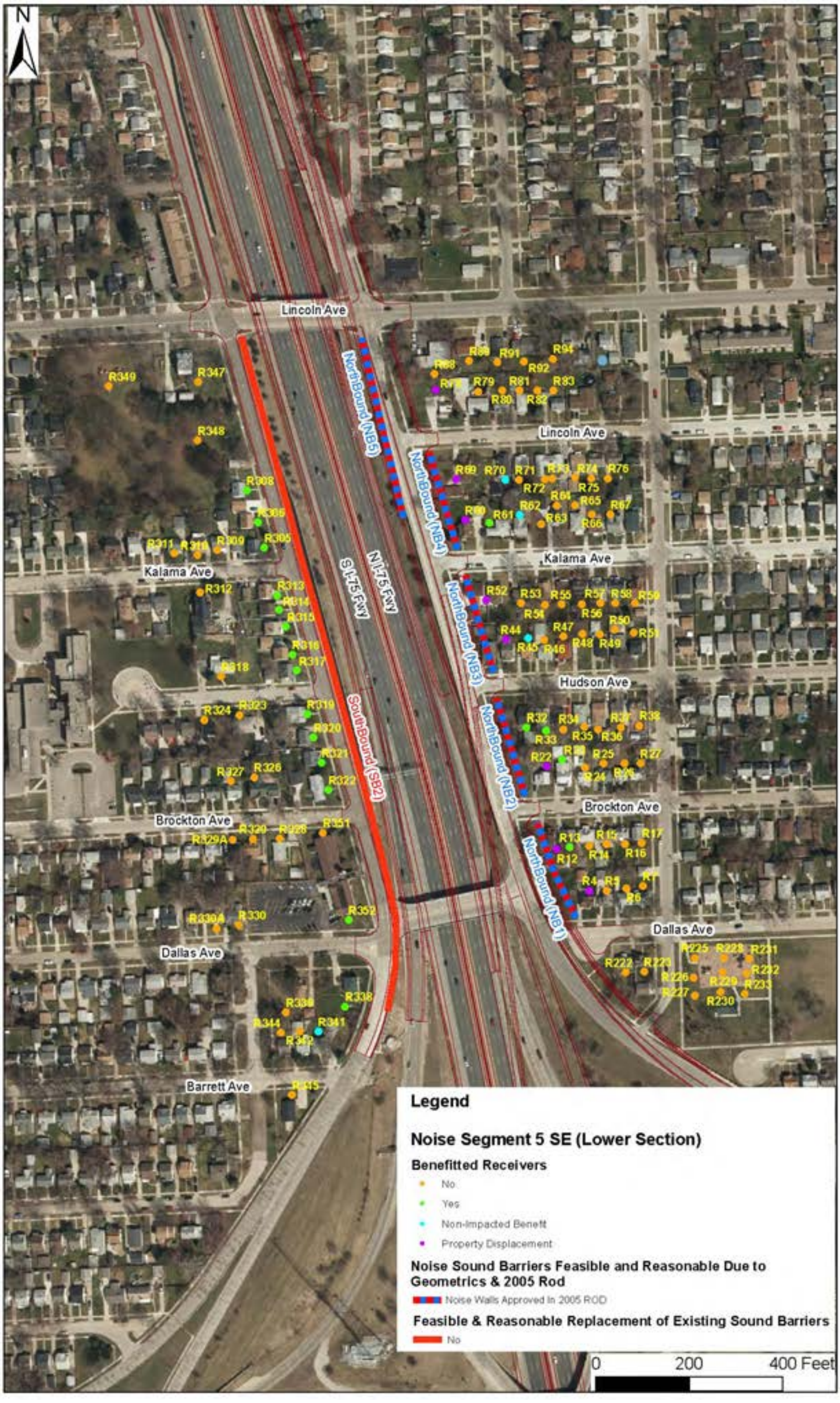


Table 34 – Feasibility and Reasonableness Assessment Noise Segment 5 SE Option 4: Full Street Access Community Side Sound Barrier Design

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No, but Walls recommended as per ROD [(2)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No, but Walls recommended as per ROD [(2)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(2)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	7
# of Impacted Receptors with 5 dB(A) Noise Reduction	5
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	8
% of Impacted Receptors with 5 dB(A)Noise Reduction	71%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	4
% of Impacted Receptors and Non-Impacted Receptors with 7 dB(A) Noise Reduction	50%
# of Impacted Receptors with 10 dB(A)Noise Reduction	1
Total Cost (dollars)	$787,500
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$98,438
Total Length (feet)	1,259 ft.
Average Height (feet)	13.9 ft.
Total Square Footage	17,500 ft.^{2}

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
(2) Sound barrier(s) recommended based on 2005 Record of Decision (ROD).

4.6.2 Southbound Replacement Sound Barrier

In the southbound direction, a replacement sound barrier was evaluated because under future 2040 Build Year traffic conditions noise levels at many first-row properties behind the existing wall are projected to exceed the 66 dB(A) impact threshold. The abatement analysis evaluated if a feasible and reasonable, replacement southbound sound barrier could be built between the I-696 Interchange and Lincoln Avenue. The analysis determined that a replacement southbound sound barrier is not warranted because it failed all MDOT feasibility and reasonableness requirements. A depiction of the evaluated replacement Southbound Sound Barrier SB2 is shown by the solid red line in Figure 25. A summary of the noise reduction levels achieved for individual receptors is provided in the far-right hand column of Table 13 along with the number of benefits shown in parenthesis. The feasibility and reasonableness of this replacement sound barrier is summarized in Table 35. A total of 16 receptors would experience a

noise reduction benefit of 5 dB(A) or more. The total length of the proposed replacement southbound sound barrier is 1,683 feet at an average height of 24 feet. The estimated cost of the proposed replacement sound barrier is approximately $1.8 million dollars and it provides abatement to 16 benefiting receptors at a CPBU of $113,603 per dwelling which is well above the $46,967 dollar limit. As a result of these findings, Southbound SB2 is not recommended and therefore, the existing sound barrier which provides some noise reduction benefit to the affected community shall remain unaltered. The sound barrier height and barrier stationing location are provided in the report Appendix E, Table E-6.

Table 35 – Feasibility and Reasonableness Assessment
Noise Segment 5 SE Southbound Lower Section Replacement Sound Barrier SB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes (1)
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No (1)
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No (1)
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No (1)
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary (1)
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	30
# of Impacted Receptors with 5 dB(A) Noise Reduction	15
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	16
% of Impacted Receptors with 5 dB(A)Noise Reduction	50%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	2
% of Impacted Receptors and Non-Impacted Receptors with 7 dB(A) Noise Reduction	13%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,817,640
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$113,603
Total Length (feet)	1,683 ft.
Average Height (feet)	24 ft.
Total Square Footage	40,392 ft.^{2}

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.6.3 Statement of Likelihood

MDOT intends to construct highway traffic noise abatement as depicted in the sound barrier design configurations represented by the blue-red dashed lines illustrated in Figure 25 based on all the noise analyses completed. All northbound proposed sound barriers are 2005 ROD approved and therefore are already recommended for construction. In the southbound direction, roadway geometrics are not a

factor and a proposed replacement sound barrier failed to satisfy MDOT's feasibility and reasonableness requirements. Therefore, a replacement southbound barrier is not recommended and the existing sound wall will remain unaltered. If it subsequently develops that these conditions have substantially changed, the abatement measures may or may not be reconsidered based on additional analysis.

4.7 Noise Segment 5 NE: Noise Abatement Findings

The upper portion of Noise Segment 5 extends from Lincoln Ave on its southern terminus to 11 Mile Road on its northern limit. The original 2016 noise abatement analysis in this area evaluated two proposed sound barrier design configurations. This report documents only the final selected design option, referred to as "Option 2". Information pertaining to the abatement findings for the previous proposed sound barrier designs are contained in the 2016 Noise Segment 5 from I-696 Interchange to 11 Mile Road study report. All northbound proposed sound barriers from I-696 Interchange to 11 Mile Road area were recommended as part of the 2005 ROD findings. A summary of the cost and acoustic effectiveness of the 2005 ROD approved and existing southbound replacement sound barriers are discussed in the subsection below.

4.7.1 Option 2: Community Side Sound Barrier Design

The overall noise abatement goal within the Noise Segment 5 NE study area is to design replacement northbound sound barriers that provide adequate noise reduction to the adjacent residential properties and to evaluate and assess potential southbound replacement sound barriers. However, because they are not affected by the roadway geometric improvements, the proposed southbound replacement sound barrier needed to satisfy all MDOT feasibility and reasonableness requirements to be recommended for construction. In addition, all abatement measures, sound barrier lengths and heights were optimized to achieve 5 dB(A) or more reduction in noise for as many benefiting dwellings as possible while attempting to keep the unit cost per benefit below MDOT's $46,967 maximum limit.

The far-right column in Table 15 provides a summary of the noise reduction levels achieved with abatement by individual receptor sites with the total number of benefitted dwellings is shown in parenthesis. Figure 26 depicts the proposed Option 2 sound barrier design configuration, within Noise Segment 5 NE study area. The design consists of five overlapping wall segments, when combined, work together to provide abatement to the community. Impacted receptors which achieve a 5 dB(A) minimum benefit is shown by a green dot on Figure 26 and non-impacted benefitted receptors are shown by a light blue dot. Additionally, a purple dot represents a property displacement and an orange dot represents a receiver location which fails to achieve the minimum 5 dB(A) noise reduction. A summary of the feasibility and reasonableness of the Option 2 sound barrier design configuration is presented in Table 36. Overall 95% of the impacted dwellings are expected to achieve a noise reduction of 5 dB(A) or more. A total of 68 properties receive a 5 dB(A) or greater benefit. In addition, 65% of the all benefiting dwellings would achieve 7 dB(A) or greater and 10 dwellings expected to achieve a 10 dB(A) or more noise reduction. Additionally, the placement of barrier segments NB2 and NB3 closer to the residential community near Hampden Street will provide 4 decibels or more noise reduction at receptors R104 to R110.

Figure 26 –Noise Segment 5 NE (Upper Section) Option 2 Sound Barrier Design Configuration Benefitting Receptors

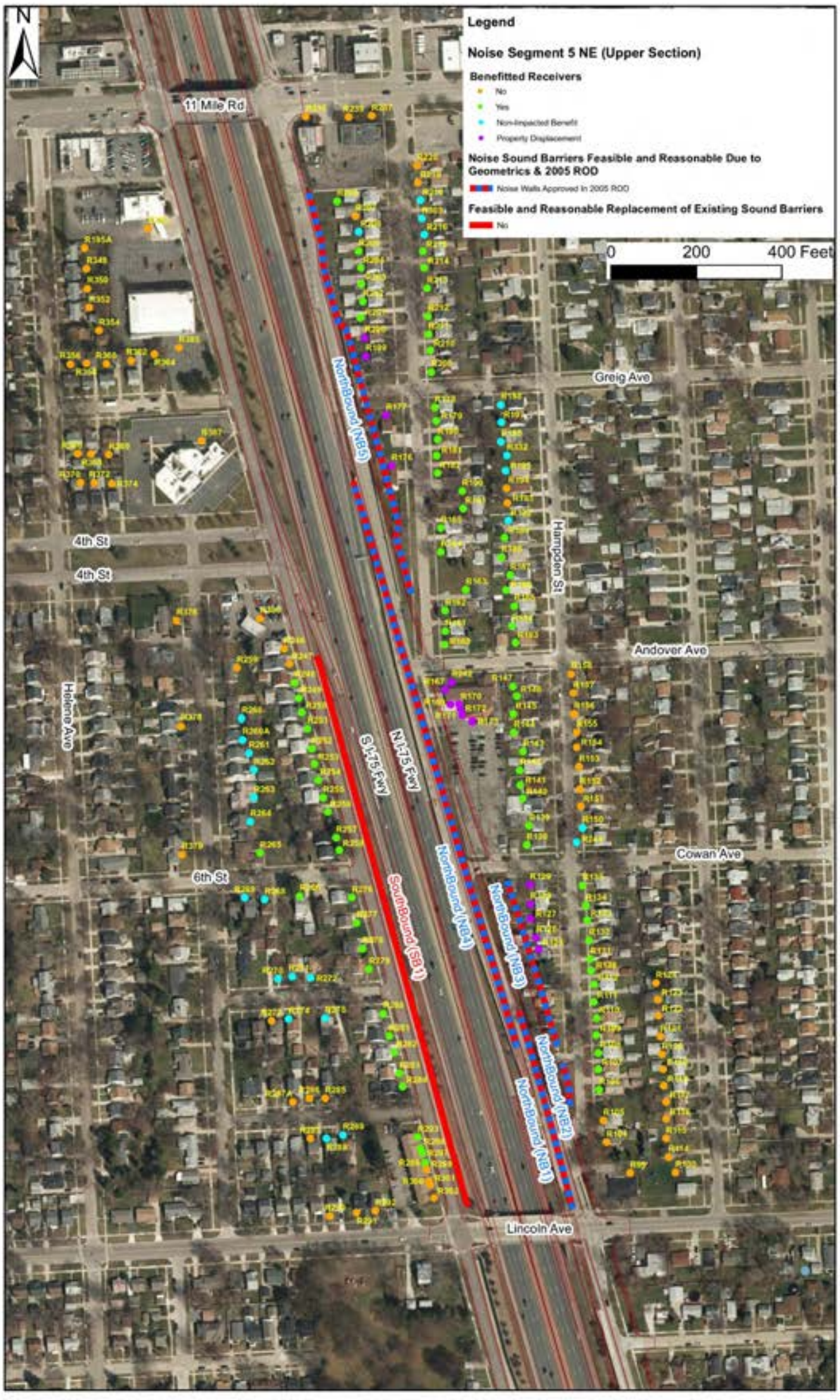


Table 36 – Feasibility and Reasonableness Assessment Noise Segment 5 NE Northbound Sound Barrier Design Option 2: Community Side Sound Barrier Design

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes (1)
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes (1)
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes (1)
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes (1)
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase (2)
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	59
# of Impacted Receptors with 5 dB(A) Noise Reduction	56
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	68
% of Impacted Receptors with 5 dB(A)Noise Reduction	95%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	44
% of Impacted Receptors and Non-Impacted Receptors with 7 dB(A) Noise Reduction	65%
# of Impacted Receptors with 10 dB(A)Noise Reduction	10
Total Cost (dollars)	$ 1,507,500
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$ 22,169
Total Length (feet)	3,350 ft.
Average Height (feet)	10 ft.
Total Square Footage	33,500 ft.^{2}

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
(2) Sound barrier(s) recommended based on 2005 Record of Decision (ROD).

The total combined length of the five sound barrier segments is 3,350 feet at an average height of 10 feet. The total estimated cost is approximately $1.5 million dollars resulting in an CPBU of $22,169. As a result of these findings, the Option 2 northbound barrier design remains recommended as per the 2005 ROD findings. Each sound barrier segment was optimized to achieve the best possible noise reduction at reasonable cost. The sound barrier height and barrier stationing location are provided in the Appendix Tables F-1 through F-5.

In the southbound direction, a replacement sound barrier was evaluated to provide better noise reduction than the existing sound barrier because the present TNM modeling analysis indicates the existing wall will be compromised and provide significantly lower noise reduction under future 2040 build traffic conditions. A summary of the noise reduction levels achieved for individual receptors is provided in the far right-hand column of Table 15 along with the number of benefits shown in parenthesis. The feasibility and reasonableness assessment of this replacement sound barrier is summarized in Table 37. A total of 26 impacted receptors (65%) would experience a noise reduction benefit of 5 dB(A) or more and 24 total dwelling (59%) are expected to achieve a noise reduction of 7 dB(A) or more. However, the 65% impacted benefits is below the 75% minimum MDOT requirement. The total length of the proposed replacement southbound sound barrier is 1,340 feet at an average height of 15.9 feet. The estimated cost of the proposed replacement sound barrier is estimated to be $958,770 dollars resulting in a CPBU of $23,385 per dwelling. Based on the study findings, proposed replacement Southbound (SB1) failed to satisfy MDOT's noise reduction requirement of 5 dB(A) or more at 75% of the impacted receptors. Therefore, based on these findings Southbound (SB1) is not recommended and will remain unaltered. A depiction of the evaluated southbound sound barrier is represented by the solid red line shown in Figure 26. The sound barrier height and barrier stationing location are provided in the report appendix Table F-6.

Table 37 – Feasibility and Reasonableness Assessment
Noise Segment 5 NE Southbound Upper Section Replacement Sound Barrier SB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes (1)
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No (1)
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes (1)
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes (1)
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary (1)
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	40
# of Impacted Receptors with 5 dB(A) Noise Reduction	26
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	41
% of Impacted Receptors with 5 dB(A)Noise Reduction	65%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	24
% of Impacted Receptors and Non-Impacted Receptors with 7 dB(A) Noise Reduction	59%
# of Impacted Receptors with 10 dB(A)Noise Reduction	7
Total Cost (dollars)	$958,770
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$23,385
Total Length (feet)	1,340 ft.
Average Height (feet)	15.9 ft.
Total Square Footage	21,306 ft.^{2}

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.7.2 Statement of Likelihood

Based on the latest noise studies, MDOT intends to construct highway traffic noise abatement depicted in the sound barrier design configuration represented by the blue-red dashed lines illustrated in Figure 26. All northbound proposed sound barriers are 2005 ROD approved and therefore are already recommended for construction. On the other hand, in the southbound direction, roadway geometrics are not a factor and a proposed replacement sound barrier failed to satisfy MDOT's feasibility requirement. Therefore, a replacement southbound barrier is not recommended and the existing sound wall will remain unaltered. If it subsequently develops that these conditions have substantially changed, the abatement measures may or may not be reconsidered based on additional analysis.

4.8 Noise Segment 5A: Noise Abatement Findings

The Noise Segment 5A study area extends from 11th Mile Road on its southern terminus to Gardenia Avenue on its northern extent. A noise abatement analysis was completed using 2040 Build Year traffic projections to determine the appropriate height and length of two northbound and two southbound sound barriers. The two-geometric widening replacement sound barriers are identified as Northbound Sound Barrier NB2 and Southbound Sound Barrier SB2. Though no existing sound wall is in the area between 11 Mile Road and University Avenue, proposed Northbound Sound Barrier NB1 was treated as an extension to Northbound Sound Barrier NB2 because some properties behind Northbound Sound Barrier NB1 receive some noise reduction benefit from Northbound Sound Barrier NB2, thus the two northbound sound barriers are evaluated as a single abatement measure. The two replacement sound barriers are needed because the existing walls adjacent to these communities will need to be removed as a result of the roadway widening improvements. In the 2005 traffic noise study, no existing sound walls were affected by roadway widening. Furthermore, a second sound barrier in the southbound direction, unaffected by roadway widening, was evaluated for replacement because future Build Year 2040 peak hour traffic conditions at first row residential properties are projected to exceed the 66 dB(A) impact threshold as illustrated in Figure 18. Therefore, a total of four sound barriers were evaluated within the Noise Segment 5A study area. The four sound barriers are depicted in Figure 27. The existing Southbound Sound Barrier SB1 was evaluated for replacement in the same general horizontal location along I-75 where it exists today.

The overall noise abatement goal within the Noise Segment 5A study area is to design optimized replacement sound barriers that provide adequate noise reduction to the adjacent residential properties. while attempting to keep the unit cost per benefit below MDOT's $46,967 maximum limit. However, because Southbound Sound Barrier SB1 is not affected by the roadway geometric improvements, the proposed replacement sound barrier must satisfy all MDOT feasibility and reasonableness requirements to be recommended for construction. The two recommended roadway geometric replacement sound barriers, are depicted in Figure 27 by the dashed blue-green lines and recommended Northbound Sound Barrier NB1 which was an extension to Northbound Sound Barrier NB2 is depicted by the solid blue line. Lastly, the proposed replacement Southbound Sound Barrier SB1 found to be feasible and reasonable and is therefore is identified by the solid blue line in Figure 27. The details of the 2040 Build Year abatement analysis findings are described below.

Figure 27 – Noise Segment 5A Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barriers NB1 & NB2 and Southbound Barriers SB1 & SB2

A summary of the feasibility and reasonableness of proposed northbound replacement sound barriers, Northbound Sound Barriers NB1 and NB2 is provided in **Error! Not a valid bookmark self-reference.**. The two northbound sound barriers provide benefit for the entire area and therefore were treated as a single abatement measure. The combined Northbound Sound Barriers NB1 and NB2 provided noise reduction of 5 dB(A) or more at 111 benefiting dwelling resulting in a unit cost of $12,870 per benefit. The two northbound replacement sound barriers consist of 2,581 combined total linear feet of sound wall at an average height of 12.3 feet providing a 7 dB(A) noise reduction to 65% of all benefiting dwellings. The total cost of the two combined northbound sound barriers is approximately $1.4 million dollars. Therefore, based on these abatement analysis findings, Northbound Noise Barriers NB1 and NB2 are recommended. Barrier wall terminus locations were optimized to achieve the best possible noise reduction at the last impacted property near the wall terminus point. In addition, all sound barrier configurations included a line-of-site evaluation to ensure first row ground level residences were fully shielded from viewing the highway. The sound barrier height and stationing location data in 50 to 100-foot increments are provided in the report Appendix G tables.

Table 38 – Feasibility and Reasonableness Assessment
Noise Segment 5A Behind Proposed Northbound Replacement Sound Barriers NB1 & NB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	83
# of Impacted Receptors with 5 dB(A) Noise Reduction	71
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	111
% of Impacted Receptors with 5 dB(A) Noise Reduction	86%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	72
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	65%
# of Impacted Receptors with 10 dB(A)Noise Reduction	35
Total Cost (dollars)	$1,428,570
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$12,870
Total Length (feet)	2,581 ft.
Average Height (feet)	12.3 ft.
Total Square Footage	31,746 ft.^{2}

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

A summary of the feasibility and reasonableness of the proposed southbound replacement Southbound Sound Barrier SB1 is provided in Table 39. Southbound Sound Barrier SB1 provides a noise reduction of 5 dB(A) or more at 86 impacted dwelling (87%) resulting in a CPBU of approximately $12,700 per benefit and a total cost of around $1.3 million dollars. Southbound Sound Barrier SB1 consists of 1,836 total linear feet at an average height of 16 feet providing a 7 dB(A) noise reduction at 76% of all benefiting dwellings. Therefore, based on these findings proposed replacement Southbound Sound Barrier SB1 is recommended. The sound barrier height and stationing location in 50 to 100-foot increments are provided in the report Appendix G tables.

Table 39 – Feasibility and Reasonableness Assessment
Noise Segment 5A Behind Proposed Southbound Replacement Sound Barrier SB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	99
# of Impacted Receptors with 5 dB(A) Noise Reduction	86
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	104
% of Impacted Receptors with 5 dB(A) Noise Reduction	87%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	79
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	76%
# of Impacted Receptors with 10 dB(A)Noise Reduction	45
Total Cost (dollars)	$1,321,920
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$12,711
Total Length (feet)	1,836 ft.
Average Height (feet)	16 ft.
Total Square Footage	29,376 ft.^{2}

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

A summary of the feasibility and reasonableness of the proposed southbound replacement Southbound Sound Barrier SB2 is provided in

Table 40. Southbound Sound Barrier SB2 is needed because roadway widening will eliminate the existing wall that provides noise abatement for this area. Southbound SB2 would cost $509,760, provide a noise reduction of 5 dB(A) or more at 11 impacted dwelling (73%) resulting in a CPBU of $46,342. Southbound Sound Barrier SB2 consists of 708 total linear feet at an average height of 16 feet. As of result of these abatement findings, Southbound Sound Barrier SB2 is recommended. The sound barrier height and stationing location in 50 to 100-foot increments are provided in the report Appendix G tables.

Table 40 – Feasibility and Reasonableness Assessment
Noise Segment 5A Behind Proposed Southbound Replacement Sound Barrier SB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes (1)
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No (2)
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No (2))
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes (1)
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase (2)
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	11
# of Impacted Receptors with 5 dB(A) Noise Reduction	8
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	11
% of Impacted Receptors with 5 dB(A) Noise Reduction	73%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	5
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	45%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$509,760
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$46,342
Total Length (feet)	708 ft.
Average Height (feet)	16.0 ft.
Total Square Footage	11,328 ft^2

(1) If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
(2) Recommended barrier Southbound Sound Barrier SB2 needed because of the elimination of the existing sound wall due to roadway widening.

4.8.1 Statement of Likelihood

MDOT intends to construct highway traffic noise abatement in the form of replacement sound barriers, Northbound Sound Barriers NB1 & NB2, as described in A summary of the feasibility and reasonableness of proposed northbound replacement sound barriers, Northbound Sound Barriers NB1 and NB2 is provided

in Error! Not a valid bookmark self-reference.. The two northbound sound barriers provide benefit for the entire area and therefore were treated as a single abatement measure. The combined Northbound Sound Barriers NB1 and NB2 provided noise reduction of 5 dB(A) or more at 111 benefiting dwelling resulting in a unit cost of $12,870 per benefit. The two northbound replacement sound barriers consist of 2,581 combined total linear feet of sound wall at an average height of 12.3 feet providing a 7 dB(A) noise reduction to 65% of all benefiting dwellings. The total cost of the two combined northbound sound barriers is approximately $1.4 million dollars. Therefore, based on these abatement analysis findings, Northbound Noise Barriers NB1 and NB2 are recommended. Barrier wall terminus locations were optimized to achieve the best possible noise reduction at the last impacted property near the wall terminus point. In addition, all sound barrier configurations included a line-of-site evaluation to ensure first row ground level residences were fully shielded from viewing the highway. The sound barrier height and stationing location data in 50 to 100-foot increments are provided in the report Appendix G tables.

Table 38, and Southbound Sound Barriers SB1 and SB2, as described in Table 39 and

Table 40 respectively. These four recommended sound barriers are depicted in Figure 27 by the solid blue lines represented by recommended Southbound Sound Barrier SB1 and Northbound Sound Barrier NB1 and the dashed blue and green lines representing the geometric replacement walls, Northbound Sound Barrier NB2 and Southbound Sound Barrier SB2. If it subsequently develops that these conditions have substantially changed, the abatement measures may or may not be provided based on additional analysis.

4.9 Noise Segment 6: Noise Abatement Findings

The present impact and abatement TNM analysis was completed using current highway design plans. A total of three sound barriers were evaluated within the Noise Segment 6 study area consisting of one southbound barrier recommended in the 2005 ROD and two additional sound barriers one in each direction evaluated due to predicted noise impacts identified under 2040 Build Year projected traffic conditions. The three sound barriers are depicted in Figure 28. In the northbound direction, the wall is identified as Northbound Sound Barrier NB1. In the southbound direction, the 2005 ROD approved sound barrier is identified as Southbound Sound Barrier SB1. Due to changes in the proposed ramp design, Southbound Sound Barrier SB1 is extended in both directions north and south from its original recommended location in the 2005 ROD noise study. A second sound barrier identified as Southbound Sound Barrier SB2 was also evaluated to mitigate new impacts determined after the 2005 study. The details of the noise abatement analysis findings are described below.

Barrier heights were optimized in one-foot increments and barrier segments were modeled up to a maximum of 100-foot lengths. In all cases, barrier terminus locations were optimized to achieve the best possible noise reduction at the last impacted property near each barrier end point. In addition, each sound barrier configuration included a line-of-site evaluation to ensure first row ground level residences were fully shielded from viewing the highway.

A summary of the noise reduction levels achieved and the number of benefitting dwellings for each modeled TNM receiver is shown in the far-right hand column of Table 19 for the Northbound Sound Barrier NB1 and Table 20 and Table 21 for the two southbound sound barriers Southbound Sound Barriers SB1 and SB2 respectively. The number of dwelling benefits is shown in parenthesis and impacted receptors which achieve the minimum 5 decibel noise reduction are shown in bold font. A total of 26 dwelling benefits were identified behind barrier Northbound NB1, 28 benefits were identified behind Southbound SB1 and 24 dwelling benefits were identified behind Southbound SB2.

A summary of the feasibility and reasonableness for the proposed Northbound Sound Barrier NB1 is provided in Table 41. Northbound Sound Barrier NB1 consists of 1,738 total linear feet of sound wall at an average height of 18.2 feet providing a 5 dB(A) or greater noise reduction to a total of 26 non-impacted and impacted dwellings. A noise reduction of 7 dB(A) or more is realized at 65% of the benefiting receptors. However, the CPBU was estimated at nearly $55,000 per benefit. Therefore, based on these findings, Northbound Sound Barrier NB1 is not recommended. The sound barrier height and barrier stationing location data in 50 to 100-foot increments are provided in the report Appendix H tables.

Figure 28 – Noise Segment 6 Sound Barrier Design Configuration for Benefitting Receivers Behind Northbound Barrier NB1 and Southbound Barriers SB1 & SB2

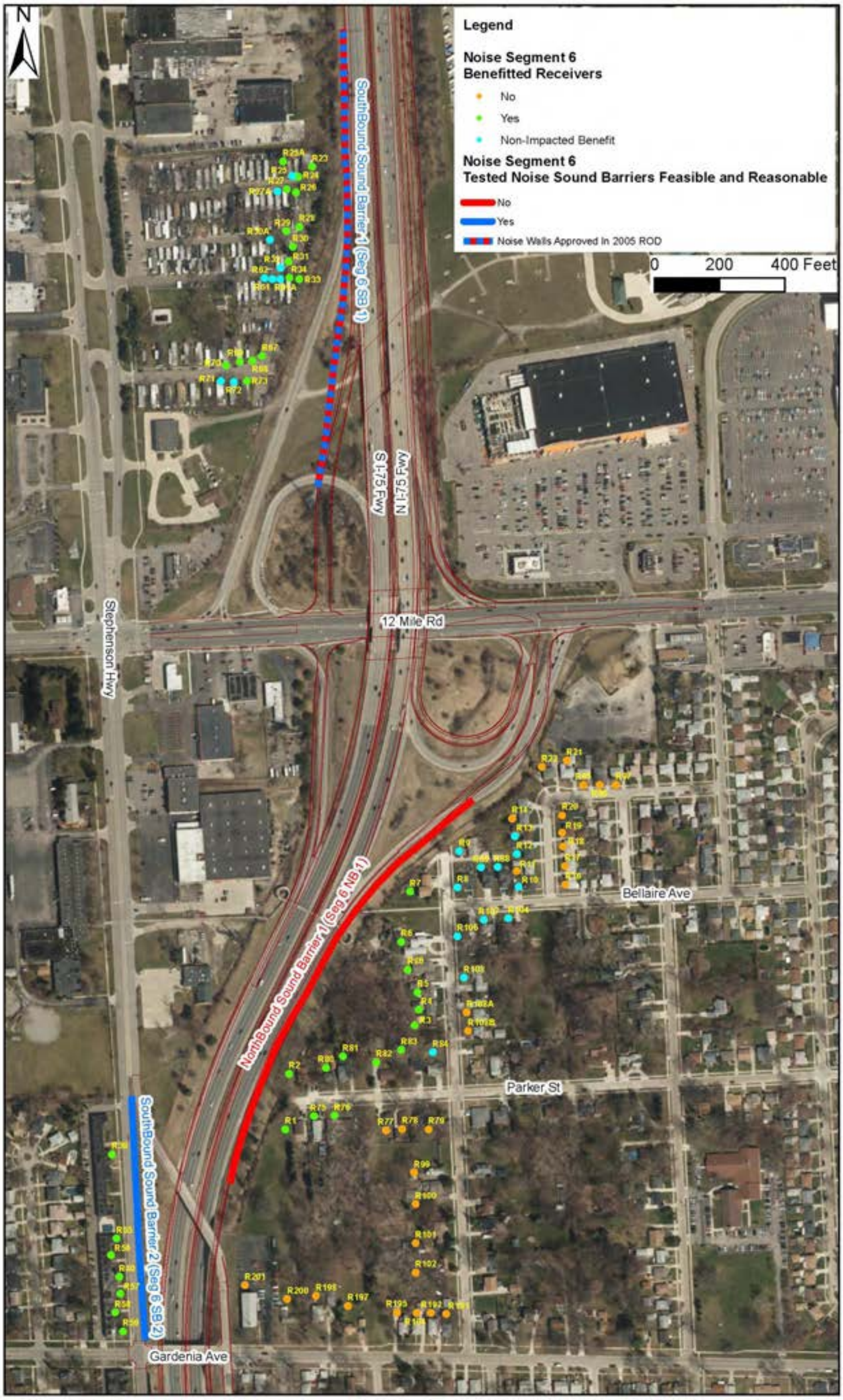


Table 41 – Feasibility and Reasonableness Assessment
Noise Segment 6 Behind Proposed Northbound Sound Barrier NB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	No [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	24
# of Impacted Receptors with 5 dB(A) Noise Reduction	13
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	26
% of Impacted Receptors with 5 dB(A)Noise Reduction	54%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	17
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	65%
# of Impacted Receptors with 10 dB(A)Noise Reduction	4
Total Cost (dollars)	$1,423,440
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$54,748
Total Length (feet)	1,738 ft.
Average Height (feet)	18.2 ft.
Total Square Footage	31,632 ft^2

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

A summary of the feasibility and reasonableness of Southbound Sound Barrier SB1 is provided in Table 42. The 2005 ROD approved sound barrier is 1,412 total linear feet in length at an average height of 17.4 feet providing abatement to 28 total benefitting dwellings. The length of Southbound SB1 was increased approximately 300 feet from its former southern most terminus point to better mitigate traffic noise flanking and improve noise reduction at the first cluster of residential properties nearest its southern extent. The CPBU is estimated to be $39,486 and the total cost is $1,105,605. Southbound Sound Barrier SB1 remains recommended. The sound barrier height and barrier stationing location data in 50 to 100-foot increments are provided in the report Appendix H tables.

Table 42 – Feasibility and Reasonableness Assessment
Noise Segment 6 Behind Proposed Southbound Sound Barrier SB1

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [1]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [1]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	No, but Wall recommended as per ROD [2]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [1]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [2]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	16
# of Impacted Receptors with 5 dB(A) Noise Reduction	16
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	28
% of Impacted Receptors with 5 dB(A)Noise Reduction	100%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	14
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	50%
# of Impacted Receptors with 10 dB(A)Noise Reduction	0
Total Cost (dollars)	$1,105,605
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$39,486
Total Length (feet)	1,412 ft.
Average Height (feet)	17.4 ft.
Total Square Footage	24,569 ft^2

[1] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.
[2] Sound barrier(s) recommended based on 2005 Record of Decision (ROD)

A summary of the feasibility and reasonableness of proposed Southbound Sound Barrier SB2 is provided in Table 43. Apart from not achieving a 10 dB(A) noise reduction at one receptor, the proposed barrier does satisfy MDOT feasibility and reasonableness requirements to be recommended. Southbound Sound Barrier SB2 is 753 linear feet in length at an average height of 14.7 feet. The proposed barrier provides 5 dB(A) or greater noise reduction to all 24 impacted dwellings (100%). The CPBU is estimated to be $20,755, which is well below the $46,967 maximum allowable limit. The total cost of the sound barrier is approximately $498,110. Noise reduction of 7 dB(A) minimum reduction is achieved at 92% of all benefiting dwellings. Therefore, based on these findings Southbound Sound Barrier SB2 is recommended. The sound barrier height and barrier stationing location data in 50 to 100-foot increments are provided in the report Appendix H tables.

Table 43 – Feasibility and Reasonableness Assessment
Noise Segment 6 Behind Proposed Southbound Sound Barrier SB2

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	Yes [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Next Phase [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	24
# of Impacted Receptors with 5 dB(A) Noise Reduction	24
# of Impacted and Non-Impacted Receptors with 5 dB(A) Noise Reduction	24
% of Impacted Receptors with 5 dB(A)Noise Reduction	100%
# of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	22
% of Impacted and Non-Impacted Receptors with 7 dB(A) Noise Reduction	92%
# of Impacted Receptors with 10 dB(A) Noise Reduction	0
Total Cost (dollars)	$498,105
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$20,754
Total Length (feet)	753 ft.
Average Height (feet)	14.7 ft.
Total Square Footage	11,069 ft^2

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.9.1 Statement of Likelihood

The MDOT intends to construct highway traffic noise abatement as described Table 42 and Table 43 and as depicted by the solid blue and blue and red dashed lines illustrated in Figure 28 based on the completed noise analyses. The indications of likely abatement measures are based on the current design for noise barrier costs and noise reduction as reported in Chapter 4 of this report for these specific sound barrier locations. If it subsequently develops that these conditions have substantially changed, the abatement measures may or may not be provided based on additional analysis.

4.10 Noise Segment 6A: Noise Abatement Findings

Two sound barrier design configurations were evaluated for cost and acoustic effectiveness. These two sound barrier locations are depicted in Figure 29 and Figure 30 as North Bound Sound Barrier 1. One location, as shown in Figure 29, considers a sound barrier at the edge of the I-75 shoulder and is

identified as Northbound Sound Barrier NB1 (Shoulder). The alternate sound barrier location, depicted in Figure 30, moves the proposed sound barrier further away from I-75 to just inside the right-of-way and is identified as Northbound Sound Barrier NB1 (ROW). The noise impact assessment found that several rows of residential properties adjacent to the I-75 northbound lanes are projected to see future unabated build noise levels above the 66 dB(A) impact threshold. The extreme far right-hand column of Table 22 and Table 23 provide a summary of the achieved noise reduction levels at each individual receptor for each of the two sound barrier design configurations with the number of benefits shown in parenthesis. Receptor sites which achieve the minimum 5 decibel noise reduction are shown in bold text. The findings indicate that eleven receptor sites can be expected to experience a noise reduction of 5 dB(A) or greater behind the proposed sound barrier at the proposed shoulder location where as only nine benefits of 5 dB(A) or greater can be expected to occur with the proposed sound barrier located just inside the right-of-way. A summary of the feasibility and reasonableness of the proposed shoulder and right-of-way sound barrier configuration options are provided in Table 44 and Table 45 respectively. At the proposed shoulder location, to provide adequate noise attenuation at the eleven receptor sites, a total length of 1,441 feet of sound barrier wall is needed with an average height of 10.1 feet. However, at the right-of-way location, 1,500 feet of sound barrier wall is needed with an average height of 12.3 feet to provide abatement for the nine benefitting receptor sites.

Additionally, as indicated in Table 44 and Table 45, the proposed sound barriers at both locations were found to exceed MDOT's $46,967 maximum allowable CPBU. The CPBU at the shoulder location was estimated to be $59,540, whereas the CPBU at the right-of-way barrier design was estimated at $92,250. Therefore, neither proposed sound barrier location satisfy the MDOT's abatement criteria for reasonable cost and thus are not recommended.

Figure 29 – Summary of Noise Segment 6A Benefitting Receivers for Proposed Northbound Shoulder Sound Barrier Design

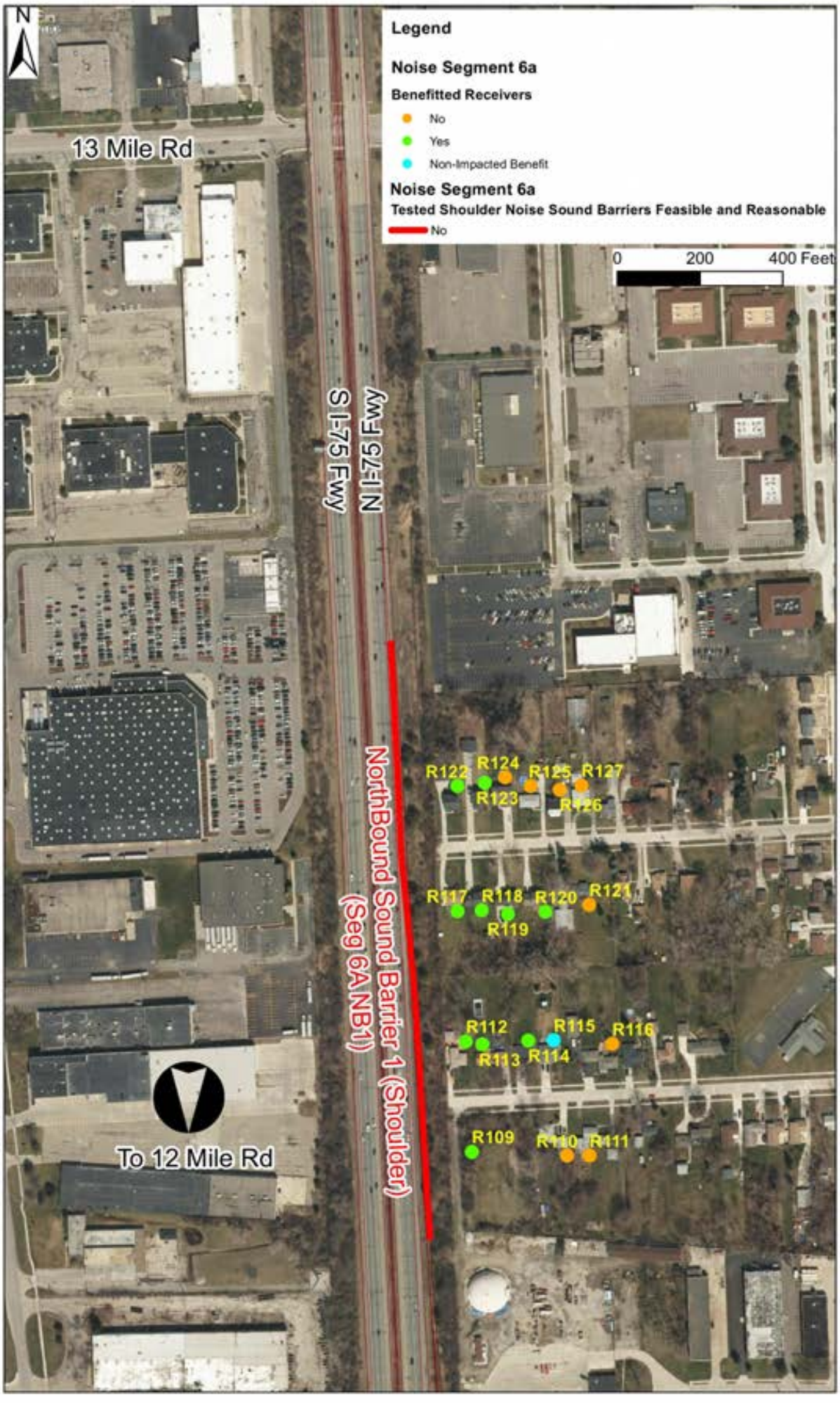


Figure 30 – Summary of Noise Segment 6A Benefitting Receivers for Proposed Northbound ROW Sound Barrier Design

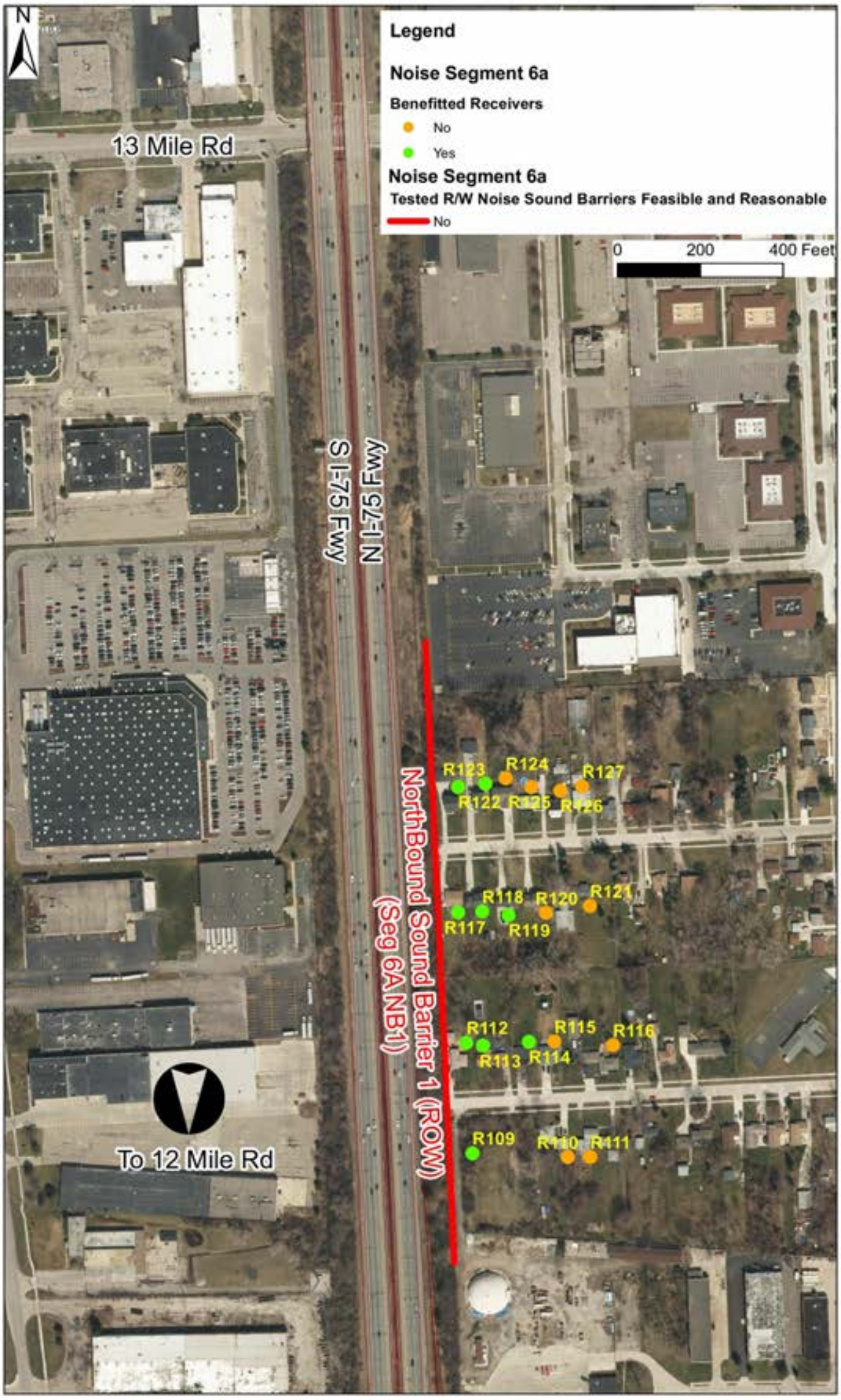


Table 44 – Feasibility and Reasonableness Assessment
Noise Segment 6A Behind Proposed Northbound Sound Barrier NB1 (Shoulder)

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	12
# of Impacted Receptors with 5 dB(A) Noise Reduction	10
# of Impacted and non-Impacted Receptors with 5 dB(A) Noise Reduction	11
% of Impacted Receptors with 5 dB(A)Noise Reduction	83%
# of Impacted and non-impacted Receptors with 7 dB(A) Noise Reduction	6
% of Impacted and non-impacted Receptors with 7 dB(A) Noise Reduction	55%
# of Impacted Receptors with 10 dB(A)Noise Reduction	1
Total Cost (dollars)	$654,930
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$59,539
Total Length (feet)	1,441 ft.
Average Height (feet)	10.1 ft.
Total Square Footage	14,554 ft^2

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

Table 45 – Feasibility and Reasonableness Assessment
Noise Segment 6A Behind Proposed Northbound Sound Barrier NB1 (ROW)

FEASIBILITY CONSIDERATION	YES OR NO
Engineering Consideration: Can the abatement measure be built?	Yes [(1)]
Acoustic Consideration: Does the proposed abatement measure provide a reduction of at least 5 dB(A) at 75% of the impacted receptors?	Yes [(1)]
REASONABLENESS CONSIDERATION	
Design Goal: Does the proposed abatement measure provide a reduction of 10 dB(A) for one benefiting receptor and at least 7 dB(A) at 50% or more of the benefiting receptor sites?	Yes [(1)]
Design Goal: Does the proposed abatement measure cost less than $46,967 per benefiting receptor site?	No [(1)]
Viewpoint of Benefiting Property Owners and Residences: Were positive responses in favor of the abatement measure obtained from at least 50% or more of the tallied votes?	Not Necessary [(1)]
DETAILS OF THE ABATEMENT MEASURE COST AND ACOUSTIC EFFECTIVE FINDINGS	
Impacted Receptors Behind Proposed Sound Barrier(s)	12
# of Impacted Receptors with 5 dB(A) Noise Reduction	9
# of Impacted and non-Impacted Receptors with 5 dB(A) Noise Reduction	9
% of Impacted Receptors with 5 dB(A)Noise Reduction	75%
# of Impacted and non-impacted Receptors with 7 dB(A) Noise Reduction	6
% of Impacted and non-impacted Receptors with 7 dB(A) Noise Reduction	67%
# of Impacted Receptors with 10 dB(A)Noise Reduction	1
Total Cost (dollars)	$830,250
Cost Per Benefitting Receptor Unit (CPBU in dollars)	$92,250
Total Length (feet)	1,500
Average Height (feet)	12.3
Total Square Footage	18,450 ft^2

[(1)] If all the questions can be answered "Yes" then the abatement measure is considered feasible and reasonable.

4.10.1 Statement of Likelihood

Based on the results of the noise analysis, the MDOT does not intend to construct highway traffic noise abatement in the form of sound barriers within the Noise Segment 6A portion of the study area as illustrated by the solid red lines depicted in Figure 29 and Figure 30. If it subsequently develops that these conditions have substantially changed, the abatement measures may or may not be provided based on additional analysis.

5.0 CONCLUSION

5.1 Noise Segment 1

Within the Noise Segment 1 study area, which covers the project alignment from 8 Mile Road to Meyers Avenue, the impact and abatement analysis found noise exposure levels above the 66 dB(A) impact threshold at most first-row residential properties. The abatement analysis findings indicate that the two northbound 2005 ROD approved sound barriers provide a 5 dB(A) or more noise reduction at 78% of the impacted dwellings. Similarly, in the southbound direction the 2005 ROD approved sound barriers provide a 5 dB(A) or more noise reduction abatement to 96% of the impacted dwellings. Therefore, based on these analysis findings, all Noise Segment 1 sound barriers are recommended.

5.2 Noise Segment 2

Within the Noise Segment 2 study area, which covers the project alignment from Meyers Avenue to 9 Mile Road, the impact analysis found noise exposure levels above the 66 dB(A) impact threshold at most first, second and many third-row residential properties, particularly in the northbound direction. The abatement analysis findings indicate that the two proposed southbound sound barriers, would exceed the MDOT $46,967 maximum cost per benefitted dwelling and thus are not recommended. The two northbound sound barriers remain both feasible and reasonable as per the 2005 ROD recommendations.

5.3 Noise Segment 3

Within the Noise Segment 3 study area, which covers the project alignment from 9 Mile Road on the southern limits to Woodward Heights Blvd on the northern extent, the impact analysis found unabated noise exposure levels above the 66 dB(A) impact threshold at most first-row residential properties throughout the segment study area. The abatement analysis evaluated three sound barriers: one adjacent to the northbound travel lanes identified as Northbound Sound Barrier NB1 and two along the southbound travel lanes identified as Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2. Northbound Sound Barrier NB1 satisfies all MDOT 2011 feasibility and reasonableness abatement requirements. Southbound Sound Barrier SB1 is a 2005 ROD recommended sound barrier and therefore was optimized to achieve adequate noise reduction for the present proposed roadway improvements and 2040 traffic projections. Lastly, the third sound barrier, Southbound Sound Barrier SB2 failed to satisfy the MDOT cost and acoustic effectiveness requirements.

5.4 Noise Segment 4

Within the Noise Segment 4 study area, which covers the project alignment from Woodward Heights Boulevard on the southern extent to just south of the I-696 interchange, the impact analysis found noise exposure levels above the 66 dB(A) impact threshold, largely limited to most first-row properties in both directions. The noise abatement analysis evaluated three sound barriers within Noise Segment 4. There was one proposed sound barrier identified along the northbound side that was previously recommended as part of the 2005 ROD commitments. This previous barrier location was covered by the

two current Northbound Sound Barriers NB1+ NB2 and were optimized to achieve adequate noise reduction under the present proposed highway design improvements and 2040 traffic conditions. In addition, in the southbound direction, one additional sound barrier, identified as Southbound Sound Barrier SB2 consisting of three wall components (identified as SB2A, SB2B and SB2C), was found to satisfy MDOT 2011 feasibility and abatement requirements. Thus, Northbound NB1+NB2 and Southbound SB2 (2A+2B+2C) are recommended.

5.5 Noise Segment 5 SE

The study findings indicate that generally in the northbound direction and with the removal of many first-row buildings to accommodate the proposed future highway design improvements, second and third row properties, which now become first and second row residential properties facing I-75, will experience 2040 peak hour noise levels above the 66 dB(A) impact threshold. The noise abatement analysis findings indicate that from I-696 Interchange to Lincoln Avenue (Noise Segment 5 SE), the northbound 2005 ROD approved sound barriers will be an effective abatement measure to reduce traffic noise exposure to the adjacent residential community. Furthermore, due to elevated noise levels behind the existing southbound wall, the noise analysis evaluated a taller replacement southbound barrier. The abatement findings indicate that the proposed southbound taller replacement barrier did not satisfy any MDOT feasibility and reasonableness requirements for cost and acoustic effectiveness. Therefore, as a result of the study findings, the 2005 ROD approved northbound sound barriers are recommended, but the proposed replacement southbound barrier is not recommended.

5.6 Noise Segment 5 NE

The study findings indicate that generally in the northbound direction and with the removal of many first-row buildings to accommodate the proposed future highway design improvements, second and third row properties which now become first and second row residential properties facing I-75 will experience 2040 peak hour noise levels well above the 66 dB(A) impact threshold. The noise abatement analysis findings indicate that from Lincoln Avenue to 11 Mile Road (Noise Segment 5 NE), the northbound 2005 ROD approved sound barriers will be an effective abatement measure in reducing traffic noise exposure to the adjacent residential community, particularly at greatest impacted residential properties. Furthermore, due to elevated noise levels behind the existing southbound wall, the noise analysis evaluated a taller replacement southbound barrier. The abatement findings indicate that the proposed southbound taller replacement barrier did not satisfy MDOT's 5 dB(A) noise reduction feasibility requirement. Therefore, as a result of the study findings, the 2005 ROD approved northbound sound barriers are recommended, but the proposed replacement southbound barrier is not recommended.

5.7 Noise Segment 5A

Within the Noise Segment 5A study area, which covers the project alignment from 11 Mile Road on the southern limits to Gardenia Avenue on its northern limits, the impact analysis found noise exposure above the 66 dB(A) impact threshold at most first and some second-row residential properties in both directions. Because of proposed roadway widening under future build conditions, one existing northbound sound

barrier and one existing southbound sound barrier will need to be eliminated and replaced. Therefore, this noise abatement analysis focused on designing and optimizing the length and height of these two roadway widening replacement sound barriers that would achieve adequate noise reduction for the affected residential communities. The two replacement sound barriers are identified as Southbound Sound Barrier SB2 and Northbound Sound Barrier NB2. In addition, in the northbound direction, Northbound Sound Barrier NB1 was added as an extension to Northbound Sound Barrier NB2, because of projected noise impacts between University Avenue and 11 Mile Road. Lastly, the abatement analysis evaluated one non-geometrically affected replacement sound barrier, identified as Southbound Sound Barrier SB1 that would potentially eliminate first row residential impacts identified behind the existing sound barrier. Replacement Southbound Sound Barrier SB1, satisfied all MDOT requirements and therefore is recommended. The taller recommended Southbound Sound Barrier SB1 will be reconstructed in the same general location where the existing sound wall is located today. Therefore, based on these analysis findings, all four recommended sound barriers are depicted in Figure 27.

5.8 Noise Segment 6

Within the Noise Segment 6 study area, from Gardenia Avenue on the southern limit to midway between 12 Mile and 13 Mile Roads at the northern terminus, the impact analysis found noise exposure above the 66 dB(A) impact threshold at most first and some second-row residential properties in both directions. The noise abatement analysis evaluated three sound barriers. One proposed sound barrier in the northbound direction, identified as Northbound Sound Barrier NB1, was found to exceed MDOT $46,967 CPBU and therefore is not recommended. The 2005 ROD approved Southbound Sound Barrier SB1 remains recommended under the 2040 Build Design and was optimized to achieve the greatest possible noise reduction at the lowest possible cost per benefit. In addition, a second southbound sound barrier, identified as Southbound Sound Barrier SB2 also resulted in satisfying the MDOT's 2011 feasibility and abatement policy requirements. Therefore, based on the noise abatement analysis findings Southbound Sound Barrier SB1 and Southbound Sound Barrier SB2 are recommended.

5.9 Noise Segment 6A

The study findings indicate that the two-proposed sound barrier design configurations do provide acoustically effective noise reduction at all effected properties. However, both design configurations exceed MDOT's maximum allowable reasonable cost limit of $46,967. Thus, noise abatement for this area is not recommended.

Appendix A
Noise Segment 1 Study Area
Sound Barrier Station Points

Table A-1 – I-75 Northbound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 1: NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2997+65.02	50	16	631	647	NB Serv. Dr. Inside Shoulder
2998+15.35	50	16	631	647	NB Serv. Dr. Inside Shoulder
2998+65.64	100	16	631	647	NB Serv. Dr. Inside Shoulder
2999+65.86	100	16	632	648	NB Serv. Dr. Inside Shoulder
3000+65.53	100	16	632	648	NB Serv. Dr. Inside Shoulder
3001+66.02	100	16	632	648	NB Serv. Dr. Inside Shoulder
3002+65.90	100	16	632	648	NB Serv. Dr. Inside Shoulder
3003+65.98	100	16	632	648	NB Serv. Dr. Inside Shoulder
3004+66.00	100	16	632	648	NB Serv. Dr. Inside Shoulder
3005+65.96	100	16	631	647	NB On Ramp Inside Shoulder
200+73.91	32	16	631	647	NB On Ramp Inside Shoulder
201+05.81[2]	N/A	16	631	647	NB On Ramp Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table A-2 – I-75 Northbound Barrier NB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 1: NORTHBOUND SOUND BARRIER NB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3009+66.61	99	16	632	648	NB Serv. Dr. Inside Shoulder
3010+65.60	100	16	632	648	NB Serv. Dr. Inside Shoulder
3011+65.58	100	16	632	648	NB Serv. Dr. Inside Shoulder
3012+65.60	100	15	632	647	NB Serv. Dr. Inside Shoulder
3013+65.68	100	15	632	647	NB Serv. Dr. Inside Shoulder
3014+65.66	100	15	632	647	NB Serv. Dr. Inside Shoulder
3015+65.88	100	15	632	647	NB Serv. Dr. Inside Shoulder
3016+65.65	100	15	631	646	NB Serv. Dr. Inside Shoulder
3017+66.63	103	15	632	647	NB Serv. Dr. Inside Shoulder
3018+70.74	104	15	632	647	NB Serv. Dr. Inside Shoulder
3019+75.46	105	16	632	648	NB Serv. Dr. Inside Shoulder
3020+80.85	102	16	632	648	NB Serv. Dr. Inside Shoulder
3021+84.11	103	16	633	649	NB Serv. Dr. Inside Shoulder
3022+87.52[2]	N/A	16	633	649	NB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table A-3 – I-75 Southbound Barrier SB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 1: SOUTHBOUND SOUND BARRIER SB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2014+43.53	100	16	633	649	SB Serv. Dr. Inside Shoulder
2015+43.51	100	16	633	649	SB Serv. Dr. Inside Shoulder
2016+43.72	100	16	633	649	SB Serv. Dr. Inside Shoulder
2017+43.75	96	16	633	649	SB Serv. Dr. Inside Shoulder
2018+37.71	96	16	633	649	SB Serv. Dr. Inside Shoulder
2019+31.19	96	16	633	649	SB Serv. Dr. Inside Shoulder
2020+24.97	95	16	633	649	SB Serv. Dr. Inside Shoulder
2021+18.92	94	16	633	649	SB Serv. Dr. Inside Shoulder
2022+12.80	52	16	633	649	SB Serv. Dr. Inside Shoulder
2022+65.26[2]	N/A	16	633	649	SB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table A-4 – I-75 Southbound Barrier SB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 1: SOUTHBOUND SOUND BARRIER SB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
1997+94.36	50	12	631	643	SB Off Ramp Inside Shoulder
1998+44.45	100	13	631	644	SB Off Ramp Inside Shoulder
1999+44.33	100	14	631	645	SB Off Ramp Inside Shoulder
2000+44.31	100	14	631	645	SB Off Ramp Inside Shoulder
2001+44.39	100	15	631	646	SB Off Ramp Inside Shoulder
2002+44.31	100	16	631	647	SB Off Ramp Inside Shoulder
2003+44.63	100	16	632	648	SB Off Ramp Inside Shoulder
2004+44.66	100	16	632	648	SB Serv. Dr. Inside Shoulder
2005+44.43	100	15	631	646	SB Serv. Dr. Inside Shoulder
102+09.86	100	15	631	646	SB Serv. Dr. Inside Shoulder
103+10.29	100	15	631	646	SB Serv. Dr. Inside Shoulder
104+10.79	100	15	631	646	SB Serv. Dr. Inside Shoulder
105+11.26	50	15	630	645	SB Serv. Dr. Inside Shoulder
105+61.16	50	15	630	645	SB Serv. Dr. Inside Shoulder
106+11.07	50	15	629	644	SB Serv. Dr. Inside Shoulder
106+61.47	50	15	628	643	SB Serv. Dr. Inside Shoulder
107+11.68[2]	N/A	15	627	642	SB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Appendix B
Noise Segment 2 Study Area
Sound Barrier Station Points

Table B-1 – I-75 Northbound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 2: NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3023+48.58	46	15	633	648	NB Serv. Dr. Inside Shoulder
3023+94.72	50	15	632	647	NB Serv. Dr. Inside Shoulder
3024+45.62	50	15	632	647	NB Serv. Dr. Inside Shoulder
3024+96.39	51	15	632	647	NB Serv. Dr. Inside Shoulder
3025+48.19	51	15	632	647	NB Serv. Dr. Inside Shoulder
3026+00.01	52	15	632	647	NB Serv. Dr. Inside Shoulder
3026+52.10	52	15	632	647	NB Serv. Dr. Inside Shoulder
3027+04.11	51	15	632	647	NB Serv. Dr. Inside Shoulder
3027+56.04	51	15	632	647	NB Serv. Dr. Inside Shoulder
3028+07.45	103	14	632	646	NB Serv. Dr. Inside Shoulder
3029+11.41	103	13	633	646	NB Serv. Dr. Inside Shoulder
3030+15.56	103	13	633	646	NB Serv. Dr. Inside Shoulder
3031+19.49	103	13	633	646	NB Serv. Dr. Inside Shoulder
3032+23.31	104	13	633	646	NB Serv. Dr. Inside Shoulder
3033+27.96	102	13	632	645	NB Serv. Dr. Inside Shoulder
3034+31.28	104	14	632	646	NB Serv. Dr. Inside Shoulder
3035+36.47	104	14	632	646	NB Serv. Dr. Inside Shoulder
3036+41.24	104	14	631	645	NB Serv. Dr. Inside Shoulder
3037+45.98	104	13	631	644	NB Serv. Dr. Inside Shoulder
3038+50.73	53	13	630	643	NB Serv. Dr. Inside Shoulder
3039+04.05	53	13	630	643	NB Serv. Dr. Inside Shoulder
3039+57.29	52	13	631	644	NB Serv. Dr. Inside Shoulder
3040+09.90	52	13	631	644	NB Serv. Dr. Inside Shoulder
3040+62.51[2]	52	12	631	643	NB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table B-2 – I-75 Northbound Barrier NB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 2: NORTHBOUND SOUND BARRIER NB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
308+98.68	62	14	628	642	NB Off Ramp Inside Shoulder
309+61.17	52	14	629	643	NB Off Ramp Inside Shoulder
310+14.27	52	14	629	643	NB Off Ramp Inside Shoulder
310+67.56	50	14	629	643	NB Off Ramp Inside Shoulder
311+19.24	50	14	630	644	NB Off Ramp Inside Shoulder
311+70.36	100	14	630	644	NB Off Ramp Inside Shoulder
312+70.21	99	14	631	645	NB Off Ramp Inside Shoulder
313+69.60	101	14	632	646	NB Off Ramp Inside Shoulder
314+70.26	100	15	633	648	NB Off Ramp Inside Shoulder
315+69.67	50	15	634	649	NB Off Ramp Inside Shoulder
316+18.75	50	15	635	650	NB Off Ramp Inside Shoulder
316+68.73	51	15	635	650	NB Off Ramp Inside Shoulder
317+18.61	50	15	635	650	NB Off Ramp Inside Shoulder
317+67.36	48	15	635	650	NB Off Ramp Inside Shoulder
318+14.93	47	15	635	650	NB Off Ramp Inside Shoulder
318+61.45[2]	N/A	15	635	650	NB Off Ramp Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table B-3 – I-75 Southbound Barrier SB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 2: SOUTHBOUND SOUND BARRIER SB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
STA 748+50	50	12	633	645	SB Serv. Dr. Inside Shoulder
STA 748+00	49	12	633	645	SB Serv. Dr. Inside Shoulder
STA 747+50	50	12	633	645	SB Serv. Dr. Inside Shoulder
STA 747+00	50	12	633	645	SB Serv. Dr. Inside Shoulder
STA 746+50	49	12	633	645	SB Serv. Dr. Inside Shoulder
STA 746+00	50	12	633	645	SB Serv. Dr. Inside Shoulder
STA 745+50	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 745+00	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 744+50	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 744+00	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 743+50	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 743+00	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 742+50	50	12	632	644	SB Serv. Dr. Inside Shoulder
STA 742+00	55	12	632	644	SB Serv. Dr. Inside Shoulder
STA 741+50	57	13	632	645	SB On Ramp Inside Shoulder
STA 741+00	98	13	632	645	SB On Ramp Inside Shoulder
STA 740+00	97	13	632	645	SB On Ramp Inside Shoulder
STA 739+00	49	13	632	645	SB On Ramp Inside Shoulder
STA 738+50	48	13	632	645	SB On Ramp Inside Shoulder
STA 738+00	50	12	630	642	SB On Ramp Inside Shoulder
STA 737+50[2]	N/A	12	629	641	SB On Ramp Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table B-4 – I-75 Southbound Barrier 2 SB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 2: SOUTHBOUND SOUND BARRIER SB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
STA 737+00	48	12	630	642	SB Serv. Dr. Inside Shoulder
STA 736+50	47	12	630	642	SB Serv. Dr. Inside Shoulder
STA 736+00	48	12	630	642	SB Serv. Dr. Inside Shoulder
STA 735+50	48	12	630	642	SB Serv. Dr. Inside Shoulder
STA 735+00	48	12	630	642	SB Serv. Dr. Inside Shoulder
STA 734+50	47	12	630	642	SB Serv. Dr. Inside Shoulder
STA 734+00	94	13	630	643	SB Serv. Dr. Inside Shoulder
STA 733+00	94	13	631	644	SB Serv. Dr. Inside Shoulder
STA 732+00	95	13	632	645	SB Serv. Dr. Inside Shoulder
STA 731+00	92	12	632	644	SB Serv. Dr. Inside Shoulder
STA 730+00	95	12	633	645	SB Serv. Dr. Inside Shoulder
STA 729+00	94	12	633	646	SB Serv. Dr. Inside Shoulder
STA 728+00	92	13	634	648	SB Serv. Dr. Inside Shoulder
STA 727+00	93	15	634	649	SB Serv. Dr. Inside Shoulder
STA 726+00	93	15	633	648	SB Serv. Dr. Inside Shoulder
STA 725+00	93	15	633	648	SB Serv. Dr. Inside Shoulder
STA 724+00	46	14	633	647	SB Serv. Dr. Inside Shoulder
STA 723+50	N/A	14	633	647	SB Serv. Dr. Inside Shoulder
STA 737+00	48	12	630	642	SB Serv. Dr. Inside Shoulder
STA 736+50	47	12	630	642	SB Serv. Dr. Inside Shoulder
STA 736+00	48	12	630	642	SB Serv. Dr. Inside Shoulder
STA 735+50	48	12	630	642	SB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Appendix C
Noise Segment 3 Study Area
Sound Barrier Station Points

Table C-1 – I-75 Northbound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 3: NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3071+76.18	50	12	633	645	NB Serv. Dr. Inside Shoulder
3072+26.48	50	12	633	645	NB Serv. Dr. Inside Shoulder
3072+76.67	50	12	633	645	NB Serv. Dr. Inside Shoulder
3073+26.86	50	12	633	645	NB Serv. Dr. Inside Shoulder
3073+76.94	51	12	633	645	NB Serv. Dr. Inside Shoulder
3074+27.50	45	13	633	646	NB Serv. Dr. Inside Shoulder
3074+72.42 Retaining Wall	105	14	632	646	NB Serv. Dr. Retain Wall
3075+77.68 Retaining Wall	100	15	632	647	NB Serv. Dr. Retain Wall
3076+78.09 Retaining Wall	100	15	631	646	NB Serv. Dr. Retain Wall
3077+78.48 Retaining Wall	100	15	631	646	NB Serv. Dr. Retain Wall
3078+78.58 Retaining Wall	100	15	632	647	NB Serv. Dr. Retain Wall
3079+78.66 Retaining Wall	100	14	632	646	NB Serv. Dr. Retain Wall
3080+78.95 Retaining Wall	101	14	633	647	NB Serv. Dr. Retain Wall
3081+79.23 Retaining Wall	120	14	633	647	NB Serv. Dr. Retain Wall
3082+98.00	80	14	633	647	NB Serv. Dr. Inside Shoulder
3083+78.05	100	14	632	646	NB Serv. Dr. Inside Shoulder
3084+77.58	100	14	632	646	NB Serv. Dr. Inside Shoulder
3085+77.28	100	15	632	647	NB Serv. Dr. Inside Shoulder
3086+77.30	100	15	632	647	NB Serv. Dr. Inside Shoulder
3087+79.20	50	15	633	648	NB Serv. Dr. Inside Shoulder
3088+29.54	38	15	633	648	NB Serv. Dr. Inside Shoulder
3088+67.69[2]	N/A	15	633	648	NB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table C-2 – I-75 Southbound Barrier SB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 3: SOUTHBOUND SOUND BARRIER SB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2072+37.23	36	15	634	649	SB Serv. Dr. Inside Shoulder
2072+73.15	50	15	634	649	SB Serv. Dr. Inside Shoulder
2073+23.35	50	15	634	649	SB Serv. Dr. Inside Shoulder
2073+73.56	50	15	633	648	SB Serv. Dr. Inside Shoulder
2074+23.10	51	15	633	648	SB Serv. Dr. Inside Shoulder
2074+73.78	49	15	633	648	SB Serv. Dr. Inside Shoulder
2075+22.84	100	15	633	648	SB Serv. Dr. Inside Shoulder
2076+22.56	72	15	633	648	SB Serv. Dr. Inside Shoulder
2076+94.18 Retaining Wall	45	14	632	646	SB Serv. Dr. Retain Wall
2077+38.90 Retaining Wall	102	14	632	646	SB Serv. Dr. Retain Wall
2078+40.85 Retaining Wall	100	14	632	646	SB Serv. Dr. Retain Wall
2079+40.05 Retaining Wall	99	14	632	646	SB Serv. Dr. Retain Wall
2080+39.02 Retaining Wall	98	14	632	646	SB Serv. Dr. Retain Wall
2081+36.14 Retaining Wall	73	14	633	647	SB Serv. Dr. Retain Wall
2082+08.78	106	15	633	648	SB Serv. Dr. Inside Shoulder
2083+14.51	100	15	633	648	SB Serv. Dr. Inside Shoulder
2084+14.65	101	15	633	648	SB Serv. Dr. Inside Shoulder
2085+15.24	101	15	632	647	SB Serv. Dr. Inside Shoulder
2086+15.98	100	15	632	647	SB Serv. Dr. Inside Shoulder
2087+16.38	50	15	632	647	SB Serv. Dr. Inside Shoulder
2087+66.57	50	15	633	648	SB Serv. Dr. Inside Shoulder
2088+16.75	47	15	633	648	SB Serv. Dr. Inside Shoulder
2088+64.39[2]	N/A	15	633	648	SB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Table C-3 – I-75 Southbound Barrier SB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 3: SOUTHBOUND SOUND BARRIER SB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
509+00.00	100	19	625	644	SB Off Ramp Inside Shoulder
508+00.00	100	19	624	643	SB Off Ramp Inside Shoulder
507+00.00	99	19	624	643	SB Off Ramp Inside Shoulder
506+00.00	101	19	627	646	SB Off Ramp Inside Shoulder
505+00.00	100	19	630	649	SB Off Ramp Inside Shoulder
504+00.00	100	19	631	650	SB Off Ramp Inside Shoulder
503+00.00	100	19	631	650	SB Serv. Dr. Inside Shoulder
502+00.00	50	19	631	650	SB Serv. Dr. Inside Shoulder
2064+00[2]	N/A	19	632	651	SB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Appendix D
Noise Segment 4 Study Area
Sound Barrier Station Points

Table D-1 – I-75 Northbound Barrier NB1 + NB2 Map Stationing Location & Approximate Length

NOISE SEGMENT 4: NORTHBOUND SOUND BARRIER NB1 & NB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
Noise Segment 4 NB1					
789+50	65	12	630	642	SB Top of Retaining Wall
790+00	50	12	630	642	SB Top of Retaining Wall
790+50	50	12	630	642	SB Top of Retaining Wall
791+00	50	12	631	643	SB Top of Retaining Wall
791+50	50	12	631	643	SB Top of Retaining Wall
792+00	50	12	631	643	SB Top of Retaining Wall
792+50	50	12	632	644	SB Top of Retaining Wall
793+00	50	12	632	644	SB Top of Retaining Wall
793+50[2]	N/A	12	633	645	SB Top of Retaining Wall
Noise Segment 4 NB2					
3093+78.13	100	15	633	648	NB Serv. Dr. Inside Shoulder
3094+77.94	100	15	633	648	NB Serv. Dr. Inside Shoulder
3095+77.76	100	15	634	649	NB Serv. Dr. Inside Shoulder
3096+77.45	100	15	633	648	NB Serv. Dr. Inside Shoulder
3097+77.11	99	15	633	648	NB Serv. Dr. Inside Shoulder
3098+76.74	100	15	634	649	NB Serv. Dr. Inside Shoulder
3099+76.34	100	15	634	649	NB Serv. Dr. Inside Shoulder
3100+75.92	100	15	634	649	NB Serv. Dr. Inside Shoulder
3101+75.49	50	15	634	649	NB Serv. Dr. Inside Shoulder
3101+25.49	50	15	633	648	NB Serv. Dr. Inside Shoulder
3102+75.05	51	15	633	648	NB Serv. Dr. Inside Shoulder
3103+25.05	51	15	634	649	NB Serv. Dr. Inside Shoulder
3103+76.47[2]	N/A	15	634	649	NB Serv. Dr. Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] This Station is the actual end of the barrier

Table D-2 – I-75 Southbound Barrier SB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 4: SOUTHBOUND SOUND BARRIER SB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
Ramp STA 2113+80	50	20	633	653	SB Serv. Dr. Inside Shoulder
Ramp STA 2113+30	51	20	633	653	SB Serv. Dr. Inside Shoulder
Ramp STA 2112+80	50	20	633	653	SB Serv. Dr. Inside Shoulder
Ramp STA 2112+30	50	20	633	653	SB Serv. Dr. Inside Shoulder
Ramp STA 2111+80	50	20	633	653	SB Serv. Dr. Inside Shoulder
Ramp STA 2111+30	50	20	633	653	SB Serv. Dr. Inside Shoulder
Ramp STA 2110+80	50	20	633	653	SB Serv. Dr. Inside Shoulder
STA 810+00	110	20	633	653	SB Serv. Dr. Inside Shoulder
STA 809+00	104	20	633	653	SB Serv. Dr. Inside Shoulder
STA 808+00	101	20	634	654	SB Serv. Dr. Inside Shoulder
STA 807+00[2]	N/A	20	634	654	SB Serv. Dr. Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] This Station is the actual end of the barrier.

Table D-3 – I-75 Southbound Barrier SB2A, SB2B & SB2C Map Stationing Location and Approximate Length

NOISE SEGMENT 4: SOUTHBOUND SOUND BARRIER SB2 (2A + 2B + 2C)					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
Noise Segment 4 SB2A					
2102+70.72	57	14	635	649	SB Serv. Dr. Inside Shoulder
2103+27.72	101	14	635	649	SB Serv. Dr. Inside Shoulder
2104+28.29	100	14	635	649	SB Serv. Dr. Inside Shoulder
2105+28.38	50	14	634	648	SB Serv. Dr. Inside Shoulder
2105+78.562[2]	N/A	14	634	648	SB Serv. Dr. Inside Shoulder
Noise Segment 4 SB2B					
796+00	50	12	631	643	SB Top of Retaining Wall
796+50	50	12	632	644	SB Top of Retaining Wall
797+00	50	12	633	645	SB Top of Retaining Wall
797+50	50	12	634	646	SB Top of Retaining Wall
798+00	50	13	634	647	SB Top of Retaining Wall
798+50	50	13	634	647	SB Top of Retaining Wall
799+00	50	13	634	647	SB Top of Retaining Wall
799+50	50	13	635	648	SB Top of Retaining Wall
800+00	50	13	635	648	SB Top of Retaining Wall
800+50	50	13	635	648	SB Top of Retaining Wall
801+00	50	13	635	648	SB Top of Retaining Wall
801+50	50	13	634	647	SB Top of Retaining Wall
802+00	50	13	634	647	SB Top of Retaining Wall
802+50	50	13	634	647	SB Top of Retaining Wall
803+002[2]	N/A	13	633	646	
Noise Segment 4 SB2B					
2090+48.70	94	14	633	647	SB Serv. Dr. Inside Shoulder
2091+43.25	101	14	632	646	SB Serv. Dr. Inside Shoulder
2092+44.50	101	14	633	647	SB Serv. Dr. Inside Shoulder
2093+45.29	101	14	633	647	SB Serv. Dr. Inside Shoulder
2094+45.77	101	14	634	648	SB Serv. Dr. Inside Shoulder
2095+46.12	100	14	634	648	SB Serv. Dr. Inside Shoulder
2096+46.35	100	14	634	648	SB Serv. Dr. Inside Shoulder
2097+46.51[2]	N/A	14	634	648	SB Serv. Dr. Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] This Station is the actual end of the barrier.

Appendix E
From I-696 Interchange to Lincoln Avenue
Noise Segment 5 SE Study Area
Sound Barrier Station Points

Table E-1 – I-75 Northbound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 5 SE NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3505+88.45	107	14	633	647	NB Outside Serv. Drive
3506+99.88	115	14	633	647	NB Outside Serv. Drive
3508+18.90[2]	N/A	14	632	646	NB Outside Serv. Drive

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table E-2– I-75 Northbound Barrier NB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 5 SE NORTHBOUND SOUND BARRIER NB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3508+80.61	119	14	632	646	NB Outside Serv. Drive
3509+99.96	95	14	632	646	NB Outside Serv. Drive
3510+95.26[2]	N/A	14	632	646	NB Outside Serv. Drive

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table E-3 – I-75 Northbound Barrier NB3 Map Stationing Location and Approximate Length

NOISE SEGMENT 5 SE NORTHBOUND SOUND BARRIER NB3					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3511+52.24	98	15	633	648	NB Outside Serv. Drive
3512+50.03	117	15	633	648	NB Outside Serv. Drive
3513+66.80[2]	N/A	15	633	648	NB Outside Serv. Drive

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table E-4 – I-75 Northbound Barrier NB4 Map Stationing Location and Approximate Length

NOISE SEGMENT 5 SE NORTHBOUND SOUND BARRIER NB4					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3514+26.18	99	15	633	648	NB Outside Serv. Drive
3515+25.12	116	15	634	649	NB Outside Serv. Drive
3516+41.03[2]	N/A	15	633	648	NB Outside Serv. Drive

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table E-5 – I-75 Northbound Barrier NB5 Map Stationing Location and Approximate Length

NOISE SEGMENT 5 SE NORTHBOUND SOUND BARRIER NB5					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3515+23.30	77	13	628	641	NB Outside Serv. Drive
3516+00.00	100	13	629	642	NB Outside Serv. Drive
3517+00.00	100	13	630	643	NB Outside Serv. Drive
3518+00.00	116	13	631	644	NB Outside Serv. Drive
3519+16.10[2]	N/A	13	633	646	NB Outside Serv. Drive

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table E-6 – I-75 Southbound Existing Sound Barrier Replacement Map Stationing Location and Approximate Length

SOUTHBOUND REPLACEMENT SOUND BARRIER LOWER NOISE SEGMENT (NOISE SEGMENT 5 SE)					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2500+18.97	85	24	635	659	SB Serv. Dr. Inside Shoulder
2501+00.00	105	24	635	659	SB Serv. Dr. Inside Shoulder
2502+00.00	104	24	634	658	SB Serv. Dr. Inside Shoulder
2503+00.00	104	24	634	658	SB Serv. Dr. Inside Shoulder
2504+00.00	100	24	634	658	SB Serv. Dr. Inside Shoulder
2504+96.18	98	24	634	658	SB Serv. Dr. Inside Shoulder
2505+94.55	98	24	634	658	SB Serv. Dr. Inside Shoulder
2506+92.81	98	24	634	658	SB Serv. Dr. Inside Shoulder
2507+91.21	93	24	635	659	SB Serv. Dr. Inside Shoulder
2508+83.77	100	24	635	659	SB Serv. Dr. Inside Shoulder
2509+83.91	100	24	635	659	SB Serv. Dr. Inside Shoulder
2510+83.82	99	24	635	659	SB Serv. Dr. Inside Shoulder
2511+83.00	101	24	634	658	SB Serv. Dr. Inside Shoulder
2512+83.87	100	24	633	657	SB Serv. Dr. Inside Shoulder
2513+83.81	50	24	634	658	SB Serv. Dr. Inside Shoulder
2514+33.83	50	24	634	658	SB Serv. Dr. Inside Shoulder
2514+83.85	50	24	634	658	SB Serv. Dr. Inside Shoulder
2515+34.01	50	24	634	658	SB Serv. Dr. Inside Shoulder
2515+83.94	50	24	633	657	SB Serv. Dr. Inside Shoulder
2516+33.86	48	24	633	657	SB Serv. Dr. Inside Shoulder
2516+81.88[2]	N/A	24	633	657	SB Serv. Dr. Inside Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Appendix F
From Lincoln Avenue to 11 Mile Road
Noise Segment 5 NE Study Area
Sound Barrier Station Points

Table F-1 – I-75 Northbound Barrier NB1
Map Stationing Location & Approximate Length

NOISE SEGMENT 5 NE NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3520+04.26	95	10	631	641	Top of NB Retaining Wall
3521+00.00	100	10	631	641	Top of NB Retaining Wall
3522+00.00	96	10	631	641	Top of NB Retaining Wall
3522+96.26	104	10	632	642	Top of NB Retaining Wall
3524+00.00	100	10	633	643	Top of NB Retaining Wall
3525+00.00[2]	N/A	10	634	644	Top of NB Retaining Wall

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table F-2 – I-75 Northbound Barrier NB2
Map Stationing Location and Approximate Length

NOISE SEGMENT 5 NE NORTHBOUND SOUND BARRIER NB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3522+56.86	44	12	634	646	NB Serv. Drive Shoulder
3522+99.36	43	12	635	647	NB Serv. Drive Shoulder
3523+42.37[2]	N/A	12	635	647	NB Serv. Drive Shoulder

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table F-3 – I-75 Northbound Barrier NB3
Map Stationing Location and Approximate Length

NOISE SEGMENT 5 NE NORTHBOUND SOUND BARRIER NB3					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3523+95.51	105	13	635	648	NB Serv. Drive Shoulder
3525+00.00	101	13	636	649	NB Serv. Drive Shoulder
3526+00.00	100	13	637	650	NB Serv. Drive Shoulder
3527+00.00	100	13	637	650	NB Serv. Drive Shoulder
3527+99.47[2]	N/A	13	635	648	NB Serv. Drive Shoulder

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table F-4 – I-75 Northbound Barrier NB4
Map Stationing Location and Approximate Length

NOISE SEGMENT 5 NE NORTHBOUND SOUND BARRIER NB4					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
1108+96.12	104	8	620	628	Top of NB Retaining Wall
1110+00.00	100	9	624	633	Top of NB Retaining Wall
1111+00.00	100	10	628	638	Top of NB Retaining Wall
1112+00.00	101	10	631	641	Top of NB Retaining Wall
1113+00.00	100	10	632	642	Top of NB Retaining Wall
1114+00.00	100	10	632	642	Top of NB Retaining Wall
1115+00.00	76	10	632	642	Top of NB Retaining Wall
3531+00.00	101	10	632	642	Top of NB Retaining Wall
3532+00.00	100	9	633	642	Top of NB Retaining Wall
3533+00.00	100	8	633	641	Top of NB Retaining Wall
3534+00.00	100	8	633	641	Top of NB Retaining Wall
3535+00.00	100	8	634	642	Top of NB Retaining Wall
3536+00.00	100	8	634	642	Top of NB Retaining Wall
3537+00.00	100	7	633	640	Top of NB Retaining Wall
3538+00.00[2]	N/A	7	632	639	Top of NB Retaining Wall

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table F-5 – I-75 Northbound Barrier NB5
Map Stationing Location and Approximate Length

NOISE SEGMENT 5 NE NORTHBOUND SOUND BARRIER NB5					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3535+09.64	135	10	635	645	Offset NB Serv. Drive Shoulder
3536+45.31	32	10	635	645	Offset NB Serv. Drive Shoulder
3536+74.33	125	10	636	646	Offset NB Serv. Drive Shoulder
3538+00.00	100	10	635	645	Offset NB Serv. Drive Shoulder
3539+00.00	100	10	634	644	Offset NB Serv. Drive Shoulder
3540+00.00	100	10	635	645	Offset NB Serv. Drive Shoulder
3541+00.00	44	10	635	645	Offset NB Serv. Drive Shoulder
3541+43.78	32	10	635	645	Offset NB Serv. Drive Shoulder
3541+72.78	120	10	635	645	Offset NB Serv. Drive Shoulder
3542+92.73	76	10	635	645	Offset NB Serv. Drive Shoulder
3543+67.93	32	10	636	646	Offset NB Serv. Drive Shoulder
3544+00.00	84	10	636	646	Offset NB Serv. Drive Shoulder
3544+84.47[2]	N/A	10	636	646	Offset NB Serv. Drive Shoulder

Table Notes:
1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.
2 This Station is the actual end of the barrier.

Table F-6 – I-75 Southbound Existing Sound Barrier Replacement Map Stationing Location and Approximate Length

SOUTHBOUND REPLACEMENT UPPER NOISE SEGMENT SOUND BARRIER SB1 (NOISE SEGMENT 5 NE)					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2517+83.87	50	15	635	650	SB Serv. Dr. Shoulder
2518+34.15	50	15	634	649	SB Serv. Dr. Shoulder
2518+84.33	50	15	634	649	SB Serv. Dr. Shoulder
2519+34.16	50	15	634	649	SB Serv. Dr. Shoulder
2519+84.24	50	15	634	649	SB Serv. Dr. Shoulder
2520+34.26	5r0	15	633	648	SB Serv. Dr. Shoulder
2520+84.18	100	16	633	649	SB Serv. Dr. Shoulder
2521+84.03	100	16	634	650	SB Serv. Dr. Shoulder
2522+84.36	100	16	634	650	SB Serv. Dr. Shoulder
2523+84.20	100	16	634	650	SB Serv. Dr. Shoulder
2524+84.30	100	16	634	650	SB Serv. Dr. Shoulder
2525+84.34	101	16	635	651	SB Serv. Dr. Shoulder
2526+85.12	100	16	635	651	SB Serv. Dr. Shoulder
2527+84.87	100	16	635	651	SB Serv. Dr. Shoulder
2528+85.20	50	17	634	651	SB Serv. Dr. Shoulder
2529+35.22	50	17	634	651	SB Serv. Dr. Shoulder
2529+85.33	50	17	634	651	SB Serv. Dr. Shoulder
2530+35.35	50	17	635	652	SB Serv. Dr. Shoulder
2530+85.37	39	17	635	652	SB Serv. Dr. Shoulder
2531+24.08[2]	N/A	17	635	652	SB Serv. Dr. Shoulder

Table Notes:

1 The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

2 This Station is the actual end of the barrier.

Appendix G
Noise Segment 5A Study Area
Sound Barrier Station Points

Table G-1 – I-75 Northbound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 5A NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3547+89.46	50	10	637	647	NB Serv. Dr. Inside Shoulder
3548+39.38	50	11	636	647	NB Serv. Dr. Inside Shoulder
3548+89.40	50	12	636	648	NB Serv. Dr. Inside Shoulder
3549+39.32	50	12	635	647	NB Serv. Dr. Inside Shoulder
3549+89.60	50	12	635	647	NB Serv. Dr. Inside Shoulder
3550+39.52	50	12	635	647	NB Serv. Dr. Inside Shoulder
3550+89.54	100	12	634	646	NB Serv. Dr. Inside Shoulder
3551+89.29	99	12	634	646	NB Serv. Dr. Inside Shoulder
3552+88.01	98	12	635	647	NB Serv. Dr. Inside Shoulder
3553+85.52	98	12	635	647	NB Serv. Dr. Inside Shoulder
3554+82.44	98	12	636	648	NB Serv. Dr. Inside Shoulder
3555+79.12	97	13	636	649	NB Serv. Dr. Inside Shoulder
3556+75.72	49	14	635	649	NB Serv. Dr. Inside Shoulder
3557+24.64	50	14	634	648	NB On Ramp Inside Shoulder
3557+74.72	51	14	634	648	NB On Ramp Inside Shoulder
1400+50.18	22	14	634	648	NB On Ramp Inside Shoulder
1400+72.56	N/A	14	634	648	NB On Ramp Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Table G-2 – I-75 Northbound Barrier NB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 5A NORTHBOUND SOUND BARRIER NB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
3560+02.76	97	14	635	649	NB Serv. Dr. Inside Shoulder
3561+00.00	100	13	635	648	NB Serv. Dr. Inside Shoulder
3562+00.00	100	12	636	648	NB Serv. Dr. Inside Shoulder
3563+00.00	100	12	636	648	NB Serv. Dr. Inside Shoulder
3564+00.00	100	12	637	649	NB Serv. Dr. Inside Shoulder
3565+00.00	100	12	637	649	NB Serv. Dr. Inside Shoulder
3566+00.00	100	12	637	649	NB Serv. Dr. Inside Shoulder
3567+00.00	100	12	637	649	NB Serv. Dr. Inside Shoulder
3568+00.00	100	12	637	649	NB Serv. Dr. Inside Shoulder
3569+00.00	100	12	636	648	NB Serv. Dr. Inside Shoulder
3570+00.00	100	12	636	648	NB Serv. Dr. Inside Shoulder
3571+00.00	100	12	636	648	NB Serv. Dr. Inside Shoulder
3572+00.00	100	12	635	647	NB Serv. Dr. Inside Shoulder
3573+00.00	100	12	635	647	NB Serv. Dr. Inside Shoulder
3574+00.00	100	12	636	648	NB Serv. Dr. Inside Shoulder
3575+00.00	22	12	637	649	NB Serv. Dr. Inside Shoulder
3575+22.31[2]	N/A	12	637	649	NB Serv. Dr. Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Table G-3 – I-75 Southbound Barrier SB1 Map Stationing Location and Approximate Length

NOISE SEGEMNT 5A SOUTHBOUND SOUND BARRIER SB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2554+65.80	53	16	635	651	SB Serv. Dr. Inside Shoulder
2555+19.15	50	16	635	651	SB Serv. Dr. Inside Shoulder
2555+69.49	50	16	635	651	SB Serv. Dr. Inside Shoulder
2556+19.56	50	16	635	651	SB Serv. Dr. Inside Shoulder
2556+69.65	50	16	635	651	SB Serv. Dr. Inside Shoulder
2557+19.64	100	16	635	651	SB Serv. Dr. Inside Shoulder
2558+19.57	100	16	635	651	SB Serv. Dr. Inside Shoulder
2559+19.71	100	16	636	652	SB Serv. Dr. Inside Shoulder
2560+19.68	100	16	637	653	SB Serv. Dr. Inside Shoulder
2561+19.55	100	16	637	653	SB Serv. Dr. Inside Shoulder
2562+19.48	100	16	638	654	SB Serv. Dr. Inside Shoulder
2563+19.43	100	16	637	653	SB Serv. Dr. Inside Shoulder
2564+19.57	100	16	637	653	SB Serv. Dr. Inside Shoulder
2565+19.55	100	16	637	653	SB Serv. Dr. Inside Shoulder
2566+19.56	100	16	637	653	SB Serv. Dr. Inside Shoulder
2567+19.61	100	16	637	653	SB Serv. Dr. Inside Shoulder
2568+19.38	100	16	637	653	SB Serv. Dr. Inside Shoulder
2569+19.42	100	16	637	653	SB Serv. Dr. Inside Shoulder
2570+19.37	100	16	636	652	SB Serv. Dr. Inside Shoulder
2571+19.51	51	16	636	652	SB Serv. Dr. Inside Shoulder
2571+70.27	51	16	636	652	SB Serv. Dr. Inside Shoulder
2572+21.05	50	16	636	652	SB Serv. Dr. Inside Shoulder
2572+71.14	31	16	636	652	SB Serv. Dr. Inside Shoulder
2573+01.71[2]	N/A	16	636	652	SB Serv. Dr. Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Table G-4 – I-75 Southbound Barrier SB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 5A SOUTHBOUND SOUND BARRIER SB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2545+88.00	112	16	636	652	SB Serv. Dr. Inside Shoulder
2547+00.00	100	16	635	651	SB Serv. Dr. Inside Shoulder
2548+00.00	100	16	635	651	SB Serv. Dr. Inside Shoulder
2549+00.00	100	16	635	651	SB Serv. Dr. Inside Shoulder
2550+00.00	99	16	634	650	SB Serv. Dr. Inside Shoulder
2551+00.00	70	16	634	650	SB Off Ramp Inside Shoulder
1301+00.00	54	16	634	650	SB Off Ramp Inside Shoulder
1301+55.13	44	16	634	650	SB Off Ramp Inside Shoulder
1302+00.00	29	16	634	650	SB Off Ramp Inside Shoulder
1302+29.06[2]	N/A	16	634	650	SB Off Ramp Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Appendix H
Noise Segment 6 Study Area
Sound Barrier Station Points

Table H-1 – I-75 Northbound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 6 NORTHBOUND SOUND BARRIER NB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
STA 905+50	49	16	616	632	NB Outside Shoulder
STA 906+00	50	17	618	635	NB Outside Shoulder
STA 906+50	50	18	619	637	NB Outside Shoulder
STA 907+00	49	19	621	640	NB Outside Shoulder
STA 907+50	49	19	622	641	NB Outside Shoulder
STA 908+00	98	20	624	644	NB Outside Shoulder
STA 909+00	99	20	627	647	NB Outside Shoulder
STA 910+00	100	19	630	649	NB Outside Shoulder
STA 201+00 Ramp	84	18	633	651	NB Outside Ramp Shoulder
STA 202+00 Ramp	99	18	636	654	NB Outside Ramp Shoulder
STA 203+00 Ramp	101	18	639	657	NB Outside Ramp Shoulder
STA 204+00 Ramp	98	18	643	661	NB Outside Ramp Shoulder
STA 205+00 Ramp	101	18	645	663	NB Outside Ramp Shoulder
STA 206+00 Ramp	98	18	647	665	NB Outside Ramp Shoulder
STA 207+00 Ramp	100	18	648	666	NB Outside Ramp Shoulder
STA 208+00 Ramp	100	18	648	666	NB Outside Ramp Shoulder
STA 209+00 Ramp	46	17	647	664	NB Outside Ramp Shoulder
STA 209+50 Ramp	53	16	646	662	NB Outside Ramp Shoulder
STA 210+00 Ramp	48	15	645	660	NB Outside Ramp Shoulder
STA 210+50 Ramp[2]	N/A	15	645	660	NB Outside Ramp Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Table H-2 – I-75 Southbound Barrier SB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 6 SOUTHBOUND SOUND BARRIER SB1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
504+38.33	62	16	640	656	SB Off Ramp Outside Shoulder
505+00.00	50	17	641	658	SB Off Ramp Outside Shoulder
505+50.00	35	18	642	660	SB Off Ramp Outside Shoulder
505+85.00	15	18	643	661	SB Off Ramp Outside Shoulder
506+00.00	50	18	643	661	SB Off Ramp Outside Shoulder
506+50.00	50	18	644	662	SB Off Ramp Outside Shoulder
507+00.00	50	18	645	663	SB Off Ramp Outside Shoulder
507+50.00	50	18	645	663	SB Off Ramp Outside Shoulder
508+00.00	100	18	645	663	SB Off Ramp Outside Shoulder
509+00.00	100	18	646	664	SB Off Ramp Outside Shoulder
510+00.00	100	18	645	663	SB Off Ramp Outside Shoulder
511+00.00	100	18	644	662	SB Off Ramp Outside Shoulder
512+00.00	100	18	642	660	SB Off Ramp Outside Shoulder
513+00.00	100	18	641	659	SB Off Ramp Outside Shoulder
514+00.00	59	18	639	657	SB Off Ramp Outside Shoulder
514+58.34	91	18	638	656	SB Off Ramp Outside Shoulder
939+00.00	100	18	638	656	SB Off Ramp Outside Shoulder
940+00.00	50	17	637	654	SB Off Ramp Outside Shoulder
940+50.00	50	16	637	653	SB Off Ramp Outside Shoulder
941+00.00	50	15	637	652	SB Off Ramp Outside Shoulder
941+50.00	50	14	637	651	SB Off Ramp Outside Shoulder
942+00.00[2]	N/A	14	638	652	SB Off Ramp Outside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Table H-3 – I-75 Southbound Barrier SB2 Map Stationing Location and Approximate Length

NOISE SEGMENT 6 SOUTHBOUND SOUND BARRIER SB2					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
2573+80.37	20	15	636	651	SB Serv. Dr. Inside Shoulder
2574+00.00	100	16	636	652	SB Serv. Dr. Inside Shoulder
2575+00.00	100	16	636	652	SB Serv. Dr. Inside Shoulder
2576+00.00	100	15	636	651	SB Serv. Dr. Inside Shoulder
2577+00.00	100	14	637	651	SB Serv. Dr. Inside Shoulder
2578+00.00	100	14	637	651	SB Serv. Dr. Inside Shoulder
2579+00.00	100	14	637	651	SB Serv. Dr. Inside Shoulder
2580+00.00	100	14	638	652	SB Serv. Dr. Inside Shoulder
2581+00.00	33	14	638	652	SB Serv. Dr. Inside Shoulder
2581+32.59[2]	N/A	14	639	653	SB Serv. Dr. Inside Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] The last station number is the end of barrier; therefore, no additional length is provided.

Appendix I
Noise Segment 6A Study Area
Sound Barrier Station Points

Table I-1 – I-75 Proposed Northbound Shoulder Sound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 6A NORTHBOUND SHOULDER SOUND BARRIER 1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
338+00.00	99	9	643	652	NB Mainline Shoulder
339+00.00	100	10	643	653	NB Mainline Shoulder
340+00.00	100	10	643	653	NB Mainline Shoulder
341+00.00	100	10	643	653	NB Mainline Shoulder
342+00.00	101	10	643	653	NB Mainline Shoulder
343+00.00	100	10	643	653	NB Mainline Shoulder
344+00.00	101	10	642	652	NB Mainline Shoulder
345+00.00	99	11	642	653	NB Mainline Shoulder
346+00.00	100	11	642	653	NB Mainline Shoulder
346+42.00	42	10	641	651	NB Mainline Shoulder
962+00.00	100	10	642	652	NB Mainline Shoulder
963+00.00	100	11	642	653	NB Mainline Shoulder
964+00.00	100	10	642	652	NB Mainline Shoulder
965+00.00	100	10	642	652	NB Mainline Shoulder
966+00.00	99	9	642	651	NB Mainline Shoulder
967+00.00[2]	N/A	9	642	651	NB Mainline Shoulder

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] This Station is the actual end of the barrier.

Table I-2 – I-75 Northbound ROW Sound Barrier NB1 Map Stationing Location and Approximate Length

NOISE SEGMENT 6A NORTHBOUND ROW SOUND BARRIER 1					
BARRIER ID	LENGTH (FEET)	HEIGHT (FEET)	BOTTOM WALL ELEVATION (FT)	TOP WALL ELEVATION[1] (FT)	WALL LOCATION
952+00.00	100	9	636	645	Approx. 10’ Inside NB ROW
953+00.00	100	10	637	647	Approx. 10’ Inside NB ROW
954+00.00	100	12	637	649	Approx. 10’ Inside NB ROW
955+00.00	100	13	638	651	Approx. 10’ Inside NB ROW
956+00.00	100	14	637	651	Approx. 10’ Inside NB ROW
957+00.00	100	14	637	651	Approx. 10’ Inside NB ROW
958+00.00	100	14	637	651	Approx. 10’ Inside NB ROW
959+00.00	100	13	637	650	Approx. 10’ Inside NB ROW
960+00.00	100	12	637	649	Approx. 10’ Inside NB ROW
961+00.00	100	13	638	651	Approx. 10’ Inside NB ROW
962+00.00	100	13	637	650	Approx. 10’ Inside NB ROW
963+00.00	100	12	636	648	Approx. 10’ Inside NB ROW
964+00.00	100	12	637	649	Approx. 10’ Inside NB ROW
965+00.00	100	12	636	648	Approx. 10’ Inside NB ROW
966+00.00	100	11	636	647	Approx. 10’ Inside NB ROW
967+00.00[2]	N/A	11	635	646	Approx. 10’ Inside NB ROW

Table Notes:

[1] The top-of-wall elevation for all proposed noise barriers must be maintained if any vertical or horizontal revisions are made to the barrier base elevation.

[2] This Station is the actual end of the barrier.