

MnDOT Metro District

2016 Highway Noise Abatement Study

September 2016

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GLOSSARY

<i>Term</i>	<i>Definition</i>
Benefited Receptor	The receptor of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dBA.
Date of Public Knowledge	The date of approval of the Categorical Exclusion (CE), the Finding of No Significant Impact (FONSI), or the Record of Decision (ROD), as defined in 23 CFR 771.
Design Year	The future year used to estimate the probable traffic volume for which a highway is designed, typically 20 years from date of project opening.
Existing Noise Level	The worst noise hour resulting from the combination of natural and mechanical sources and human activity usually present in a particular area.
Feasibility	The combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.
Future Noise Level	The worst hourly traffic noise level predicted for the design-year using an approved noise prediction model.
Impacted Receptor	A receptor that has a traffic noise impact (see definition for traffic noise impacts).
L10	The sound level that is exceeded 10 percent of the time (the 90th percentile) for the period under consideration. L10(h) is the hourly value of L10.
L50	The sound level that is exceeded 50 percent of the time (the 50th percentile) for the period under consideration. L50(h) is the hourly value of L50.
Leq	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 Leq(h) being the hourly value of Leq.
Multifamily Dwelling	A residential structure containing more than one residence. Each residence in a multifamily dwelling shall be counted as one receptor when determining impacted and benefited receptors.
Noise Abatement Criteria (FHWA)	The Noise Abatement Criteria (NAC) represent the upper limit of FHWA acceptable highway traffic noise for different types of land uses and human activities, when approached or exceeded noise abatement would need to be considered.
Noise Area Classification (State)	The Noise Area Classification as identified in Section 4, Table 2, are groupings of land use activities established in the State Noise Rules.
Noise Barrier	A physical obstruction that is constructed between the highway noise source and the noise sensitive receptor(s) that lowers the noise level, including standalone noise walls, noise berms (earth or other material), and combination berm/wall systems.
Noise Level (A-weighted)	The sound pressure level obtained through use of A-weighting characteristics. The unit of measure is the decibel (dB), commonly referred to as dBA when A-weighting is used.
Noise Reduction Design Goal	The desired dBA noise reduction determined from calculating the difference between future build noise levels with abatement, to future build noise levels without abatement. The noise reduction design goal is 7 dBA (must be achieved at a minimum of one receptor for each proposed

<i>Term</i>	<i>Definition</i>
	barrier to achieve reasonableness).
Noise Sensitive Area	A geographic area containing a collection of noise sensitive receptors that might be protected behind a single noise barrier, such as a continuous neighborhood of homes abutting one side of the highway between two interchanges.
Permitted	A definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit.
Property Owner	An individual or group of individuals that holds a title, deed, or other legal documentation of ownership of a property or a residence.
Reasonableness	The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.
Receptor	An outdoor place where frequent human use occurs and a lowered noise level may be of benefit. Also, a discrete location of a noise sensitive area(s), for any of the land uses listed in Table 1 (Section 4.1).
Residence	The official location of a household or dwelling unit. Either a single family residence or each dwelling unit in a multifamily dwelling.
Statement of Likelihood	A statement addressing the likelihood of noise abatement provided in the environmental clearance document based on the feasibility and reasonableness analysis completed at the time the environmental document is being approved.
STIP	An overview of the anticipated expenditures for all modes of transportation under the authority of MnDOT. It includes information on projects that utilize federal-aid highway and transit funding, as well as a description, financial summary and project listing for other modal programs that are not subject to the federal planning requirements.
Substantial Construction	The granting of a building permit, prior to right-of-way acquisition or construction approval for the highway.
Substantial Noise Increase	One of two types of highway traffic noise impacts. For a Type I project, an increase in noise levels of 5 dBA in the design year over the existing noise level.
Traffic Noise Impacts	Design year build condition noise levels that approach or exceed the FHWA NAC listed in Table 1 (Section 4.1), or exceed State Noise Standards listed in Table 2 (Section 4.1) for the design year build condition; or design year build condition noise levels that create a substantial noise increase over existing noise levels.
Type I Projects	A proposed Federal or Federal-aid highway project for the construction of a highway meeting one or more of the following conditions. (1) The construction of a highway on new location; or, (2) The physical alteration of an existing highway where there is either: (i) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or, (ii) Substantial Vertical Alteration. A project that removes shielding, therefore exposing the line-of-sight between the receptor and the traffic noise source. This is done by either altering the vertical alignment of the highway or by altering the topography (not including the addition or removal of vegetation) between the highway traffic

<i>Term</i>	<i>Definition</i>
	<p>noise source and the receptor; or,</p> <p>(3) Bridge replacement projects that satisfy item (2), above.</p> <p>(4) The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, contraflow lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or,</p> <p>(5) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane.</p> <p>(6) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,</p> <p>(7) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,</p> <p>(8) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.</p> <p>(9) If a project is determined to be a Type I project as defined above, then the entire project area as defined in the environmental document is a Type I project.</p>
Type II Project	A Federal or Federal-aid highway project for noise abatement on an existing highway; often referred to as retrofit projects. Eligibility requires the development of a priority ranking system to allow for consistent and uniform application of a Type II Program State-wide.
Type III Project	A Federal or Federal-aid highway project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

1995 LEGISLATIVE DIRECTIVE

161.125 Sound abatement along highways.

Subdivision 1. Implementation. The Commissioner of Transportation shall implement a noise abatement study and noise abatement measures within or along the perimeter of freeways and expressways in incorporated areas contingent on the availability of funding, in accordance with section 116.07, subdivision 2a. The Commissioner shall report to the legislature by February 1, 1997, on noise abatement studies and measures undertaken during the previous calendar year and planned for the next three years under this subdivision. The study must include a survey of all applicable noise standards and feasible noise abatement measures, and an evaluation of their ability to protect citizens.

Subd. 2. Repealed, 1977 c 454 s 49

Subd. 3. Sound abatement measures. For the purpose of this section, sound abatement measures include but are not limited to the following:

- (a) traffic management measures, including reduced speed limits or exclusion and rerouting of excessively noisy vehicles;*
- (b) design and construction measures, including use of sound absorbing road surface materials, landscaping and planning, acquisition of buffer zones or noise insulation of buildings on abutting property;*
- (c) enforcement of the motor vehicle source noise limits of the Pollution Control Agency and of the Federal Bureau of Motor Carrier Safety; and*
- (d) other measures designed for the purpose of reducing motor vehicle source noise or reducing the effects of that noise. The Commissioner of Public Safety shall cooperate with the Commissioner of Transportation in implementing any sound abatement measures that include law enforcement activities.*

*1975 c 203 s 20; 1976 c 164 s 1; 1976 c 166 s 7; 1977 c 454 s 13, 14; 1978 c 791 s 18; 1981 c 357 s 49; 1983 c 326 s 1; 1995 c 265 art 2 s 16
161.13 MS 1957 u Repealed, 1959 c 500 art 6 s 13*

This initial statute was updated in 2008, and the changes are provided on the following page.

Statute 161.125, updated 2008

Minnesota Statutes 2008, section 161.125, subdivision 1, is amended to read:

Subdivision 1.

Implementation.

The commissioner of transportation shall implement noise abatement measures within or along the perimeter of freeways and expressways in incorporated areas contingent on the availability of funding, in accordance with section [116.07, subdivision 2a](#).

2013 LEGISLATIVE AUDIT

In October 2013, the State of Minnesota’s Office of the Legislative Auditor released an Evaluation Report for MnDOT Noise Barriers.

Two of the Major Facts and Findings in the project summary include:

Facts and Findings	Key Recommendations
<i>MnDOT’s method for prioritizing potential state-funded noise barrier projects does not fairly rank some locations.</i>	<i>MnDOT should revise its method of prioritizing state-funded noise barrier projects.</i>
<i>MnDOT has made key noise barrier policy decisions with limited outside input and has not always documented the reasons for its choices.</i>	<i>MnDOT should increase transparency in its noise barrier policy decision making.</i>

The Report Summary from the Legislative Audit states the following:

MnDOT should modify its state-funded noise barrier program.

Since 1997, MnDOT’s Metro District, which administers department operations in the Twin Cities metropolitan area, has run a state-funded program to build noise barriers on existing highways.

Because the funding (\$2 million annually) comes from district-level discretionary funds, it is only available for locations inside the metropolitan area. We think the program’s geographic restrictions are inappropriate. Since the program uses state money, all locations in Minnesota meeting MnDOT’s criteria should be eligible.

MnDOT uses mathematical formulas to assess potential noise barrier locations and rank them on a priority list. Locations move up the list very slowly; MnDOT built only eight state-funded barriers in the six years from 2007 to 2012.

MnDOT’s ranking method is not fair to some communities. Locations with very similar characteristics can be separated by 20 or more places on the list, a difference that can mean an extra wait of more than a decade.

Additionally, MnDOT's ranking method does not give appropriate weight to locations that experience exceptionally loud traffic noise.

MnDOT has developed its noise policies administratively with insufficient transparency.

Despite demonstrated public and legislative interest in noise barrier issues, MnDOT has not sought public input when revising its noise abatement policies. However, MnDOT has involved local governments, unlike other states.

MnDOT has not documented the rationale for some key decisions, making it difficult to later determine why a certain approach was taken. For example, MnDOT has built noise barriers primarily out of wood since the 1970s without ever fully investigating the costs and benefits of alternative materials. Few other states routinely build wooden noise barriers.

Given the ongoing public interest in MnDOT's noise barrier activities, the department should open up its policymaking activities to greater outside involvement and scrutiny. Doing so would improve public communication and limit the department's reliance on the institutional memories of key staff.

EXECUTIVE SUMMARY

INTRODUCTION

The Minnesota Legislature, in 1995, requested that the Minnesota Department of Transportation (MnDOT) conduct a study to:

- Survey highway noise conditions along freeways and expressways inside incorporated areas in Minnesota.
- Identify areas where state and federal residential noise standards are exceeded.
- Assess the feasibility, reasonableness and cost effectiveness of implementing noise mitigation measures.
- Report back to the Minnesota Legislature on measures taken and planned to reduce and minimize the effects of highway noise along freeways and expressways in incorporated areas of Minnesota.

This report summarizes the Metro District update, performed in 2016. This update only includes the 8 county metro area. It includes background information on the subject of highway noise and an overview of noise standards and mitigation measures used in the metro area. The methodologies used to analyze noise levels and determine cost effective mitigation opportunities are summarized. Results, conclusions and next steps are presented for addressing mitigation needs in priority areas.

The approach and methodologies for conducting much of the study were developed by MnDOT Metro District in coordination with a committee of 16 staff members from interested communities. This coordination with communities is done in effort to increase transparency in its noise barrier policy decision making. This report will be shared with the Minnesota Legislature consistent with Section 161.125, Chapter 161, *Laws of Minnesota* and other transportation partners involved in highway related noise activities.

Study results provide a framework for identifying where funding for noise mitigation can be targeted to achieve the most cost effective benefits for state residents in the 8 county metro area.

OVERVIEW OF METHODOLOGY AND STUDY RESULTS

Noise monitoring was conducted following standardized measurement procedures outlined in MPCA administrative rules. Procedures developed by MnDOT and MPCA were used to rank different residential areas in terms of the severity of highway noise impacts and the number of residences impacted. In addition, an estimate of cost effectiveness was used to identify optimal areas for investment in highway noise mitigation measures.

Based on this analysis, the 31 highest impacted areas that offer, potentially, the most cost effective opportunities for future noise mitigation are identified. The locations of these top ranked priority sites are shown in a figure in the Appendix of this report.

SUMMARY OF NEXT STEPS

While funding for the program continues, noise mitigation will be offered to communities based on the priority rankings identified in this study. The program will continue until:

- 1) There is no funding
- 2) All cost-effective mitigation sites have been built or rejected by the community
- 3) The study is updated in Year 2021 (anticipated)
- 4) New direction is given via MnDOT noise policy, or legislation

The availability of state funds and the status of competing transportation priorities will influence the extent to which progress can be made in addressing priority areas identified in this report.

Based on the noise analysis that was conducted, the following next steps have been identified:

1. MnDOT will continue with preliminary design and final design studies to ensure that proposed noise wall construction from the priority list is feasible, reasonable and cost effective.
2. MnDOT will continue working with municipalities, residents and area transportation partners in those priority areas where noise wall construction is being proposed. This work will include an assessment of the public's acceptance of the proposed noise wall(s).
3. MnDOT will develop cost estimates and identify funding for top ranking sites identified in this priority study by working through the State Transportation Improvement Program (STIP) investment process. MnDOT will have discretionary authority over the use of state funds.

Additionally, Federal and state funds will continue to be sought for any noise mitigation needed in conjunction with proposed new highway construction and major reconstruction projects.

4. MnDOT will continue working with local units of government to coordinate land use planning adjacent to transportation facilities.

MINNESOTA HIGHWAY NOISE ABATEMENT STUDY

BACKGROUND

Noise pollution was one of the many environmental concerns that led to the passage of the National Environmental Policy Act (NEPA) in 1969. As a consequence of NEPA, Congress passed the Federal-Aid Highway Act of 1970, which directed the Secretary of the Department of Transportation (U.S.DOT) to promulgate guidelines designed to ensure that possible adverse environmental effects, including noise, and the cost of eliminating or minimizing such adverse effects be considered in the development of all projects on federal-aid transportation systems. This Act further specified that,

“(1) The Secretary, after consultation with appropriate Federal, State and local officials, shall develop and promulgate standards for highway noise levels compatible with different land uses and after July 1, 1972, shall not approve plans and specifications for any proposed project on any Federal-aid system for which location approval has not yet been secured unless he determines that such plans and specifications include adequate measures to implement the appropriate noise level standards”.

To implement the above requirements, the Federal Highway Administration (FHWA) of the U.S.DOT, issued Policy and Procedural Memorandum 90-2, entitled “Noise Standards and Procedures”, in April 1972. The Federal-Aid Highway Act of 1973, revised Section (1) of the Federal-Aid Highway Act of 1970 (noted above) to permit FHWA to develop and promulgate standards for the control of traffic noise on existing highways.

NOISE ABATEMENT CRITERIA AND STANDARDS

The FHWA established noise abatement criteria for different types of land uses that apply to all hours of the day and night. The FHWA noise abatement criteria are intended to provide guidance for where noise abatement should be considered. The FHWA noise abatement criteria use an hourly L10 for describing highway noise. To be in compliance, the L10 hourly noise levels must not exceed the FHWA noise abatement criteria. Current FHWA noise abatement criteria for different types of land uses are shown in the following table.

23 CFR Part 772: Federal Noise Abatement Criteria

Activity Category	Activity Criteria ^{(1) (2)}	Evaluation Location	Activity Description
	L ₁₀ (h)		
A	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 ⁽³⁾	70	Exterior	Residential
C ⁽³⁾	70	Exterior	Active sport areas, amphitheatres, 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	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 ^{(3), (4)}	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 (water resources, water treatment, electrical), and warehousing
G	--	--	Undeveloped lands that are not permitted

⁽¹⁾ In Minnesota, traffic noise impacts are determined using the hourly L₁₀ value.

⁽²⁾ The L₁₀(h) Activity Criteria values are for impact determination only and are not design standards for noise abatement measures.

⁽³⁾ Includes undeveloped lands permitted for this activity category.

⁽⁴⁾ Hotels and motels that function as apartment buildings are classified under Activity Category B.

Initially, federal funds could be used for noise mitigation on both new highway construction and major reconstruction projects and along existing freeways and expressways where noise levels were found to exceed FHWA noise abatement criteria. Over the years, the use of federal funds for noise mitigation along existing routes has become more limited. The National Highway System Designation Act of 1995 restricts federal participation in the construction of

noise walls to those projects that were approved before November 28, 1995 or are proposed along lands where land development or substantial construction predated the existence of any highway.

While the federal government in the early 1970's was enacting environmental laws and regulations, similar actions were occurring at the state level. In 1973 the Minnesota State Legislature enacted the Minnesota Environmental Policy Act and so declared that,

"...it is the continuing responsibility of the state government to use all practicable means consistent with other essential considerations of state policy to improve and coordinate state plans, functions, programs and resources to the end that the state may...", among the goals, "...minimize noise, particularly in urban areas..."

In assigning state agency authority for the regulation of noise the Legislature directed the MPCA to adopt state noise standards (M.S. 116.07, Subdivision 2). In 1974 Minnesota adopted state noise standards.

The Minnesota state standards that were adopted identify maximum outdoor hourly noise levels for various land-use activities. Minnesota's noise standards are based on an hourly L10 noise descriptor, that sets the level which may not be exceeded for more than 10 percent of the time (6 minutes), and an L50 noise descriptor which sets the level that may not be exceeded more than 50 percent of the time (30 minutes). In addition, Minnesota's MPCA noise standards include different residential noise level standards for daytime hours (7:00 a.m. to 10:00 p.m.) and nighttime hours (10:00 p.m. to 7:00 a.m.). Minnesota state noise standards are shown in the following table:

Minnesota Pollution Control Agency State Noise Standards					
Land Use	Code	Day (7:00 a.m. – 10:00 p.m.) dBA		Night (10:00 p.m. – 7:00 a.m.) dBA	
Residential	NAC-1	L10 of 65	L50 of 60	L10 of 55	L50 of 50
Commercial	NAC-2	L10 of 70	L50 of 65	L10 of 70	L50 of 65
Industrial	NAC-3	L10 of 80	L50 of 75	L10 of 80	L50 of 75

There are several key differences between FHWA noise abatement criteria and Minnesota’s noise standards.

- First, Minnesota’s noise standards for residential areas are 5 dBA to 15 dBA more restrictive than the noise abatement criteria used by the FHWA.
- A second important difference is that Minnesota’s residential noise standards distinguish between periods of the day and night, with the nighttime standards being more restrictive than daytime standards. By definition, Minnesota’s nighttime noise standards continue the quieter nighttime noise standards into morning rush hour commuting times when traffic volumes are heavy on most urban freeways and expressways. As a result, achieving compliance with the standards between 6:00 a.m. to 7:00 a.m. is extremely difficult or not feasible.
 - Note that Minnesota Statute 116.07, subd 2a exempts most types of highway noise from compliance with the MPCA State Noise Standards listed above, provide all reasonably available mitigation measures are employed.

FEASIBLE NOISE MITIGATION MEASURES

A number of mitigation measures have been studied and implemented across the country to minimize highway noise impacts on adjacent residential areas.

The principal measures that have been considered for mitigating highway noise impacts include:

- Traffic management strategies
- Pavement materials and/or highway surface treatments
- Vegetation plantings
- Earth berms
- Buffer zones
- Land use planning
- Acoustical insulation of buildings
- Control or reduction in vehicle source emissions
- Noise walls

It should be noted that effective land use planning and earth berms are potentially the most cost effective noise mitigation strategies available. However, effective land use planning isn't generally an available option where retrofit noise mitigation is being considered. Retrofit noise mitigation usually entails mitigation in areas where the land use is already determined. Earth berms require large amounts of right of way for their construction. In areas where retrofit noise mitigation is the goal, there usually isn't enough available right of way to make earth berms a viable option.

In areas where retrofit noise mitigation is being considered, the already existing circumstances usually make noise walls the most cost effective approach to noise mitigation. However, even noise walls are not effective at mitigating highway noise impacts in all cases. Highway noise walls must have sufficient height, length and uninterrupted construction to be effective, which requires controlled highway access and the availability of adequate right of way. In addition, noise mitigation measures are not permitted where they would jeopardize highway safety.

Additional information on these measures is included in the Appendix of this report.

MINNESOTA'S EXPERIENCE WITH HIGHWAY NOISE MITIGATION

The Minnesota Highway Department¹ first began receiving complaints regarding highway generated noise during the period of the late 1960's and early 1970's, when noise related laws and regulations were being adopted at both the federal and state levels.

In response to such citizen and government agency concerns, the Department began adopting policy directives incorporating noise considerations into highway planning, design and construction activities.

MnDOT began constructing noise walls and barriers in conjunction with new construction and major reconstruction projects in the mid-1970's. In 1975, the Minnesota State Legislature directed the Commissioner to provide retrofit noise abatement along existing interstate freeways in the Twin Cities metropolitan area where the ambient noise levels exceeded FHWA noise abatement criteria. To accomplish this task, the Commissioner was authorized to expend one percent of the Department's revenues derived from an increase in the state motor vehicle gas tax. The money generated from this provision, coupled with matching federal-aid interstate funds resulted in a potential noise abatement program of 10 to 12 million dollars annually.

In 1978, the Minnesota Legislature placed a moratorium on the construction of any additional retrofit highway noise walls along already completed trunk and interstate highways except for those projects for which construction had been programmed as of March 1, 1978. During this period, noise mitigation measures continued to be incorporated as needed into the planning and design of new highway construction and major reconstruction projects.

The moratorium on the construction of highway noise walls along already completed highways expired in 1980. Previous funding available for retrofit noise abatement projects was shifted to other needs. As a result, between 1980 and 1994, no retrofit projects were constructed.

¹ The Minnesota Highway Department was merged into a newly established Minnesota Department of Transportation by legislative action in 1976

In 1994, specific legislation was adopted authorizing MnDOT to construct a noise wall along a section of Trunk Highway 280 in St. Paul. It was becoming clear that some type of program for noise mitigation along existing highways would be needed.

In 1995, to assure optimal use of investments in highway noise mitigation, the Legislature directed the Commissioner of Transportation to carry out a noise abatement study to identify areas where noise levels exceed residential standards and to develop a priority list for directing state resources in noise mitigation.

The first highway noise abatement study was published in 1997, and was updated in 2002, 2008 and 2011. These updates incorporated recent construction projects that may have evaluated or included noise mitigation, thereby dropping sites from the list. Noise measurements were also updated, resulting in sites being added to the list if they now exceeded the State's daytime L10 standard. Conversely, sites with new measurements found to now be below the State's residential daytime L10 standard were removed from the list.

In 2013, a legislative audit was conducted, resulting in revised ranking calculations. The new calculation has been updated in this 2016 report, where locations with higher existing noise levels demonstrate a greater need for mitigation over locations with lower noise levels.

STUDY METHODOLOGY

MnDOT conducted noise monitoring at over 235 residential areas adjacent to freeways and expressways in incorporated areas in the Metro area.

The overall study methodology was developed jointly by MnDOT and a committee of 16 representative city staff. Noise monitoring was conducted using the procedures outlined in Minnesota Rules Chapter 7030.0060. A more detailed summary of the methodology is included in the Appendix of this report.

The following summarizes the major steps used in this 2016 Metro District Highway Noise Abatement Study:

1. Residential areas located along freeways and expressways inside incorporated areas of the metro area where barrier construction appeared feasible were identified.
2. Representative noise level measurements were taken at sites in each of the identified residential areas. Those areas, which do not exceed state daytime noise standards, were dropped from further analysis.
3. Using a methodology developed by MnDOT, and with a committee of 16 representative city staff, scores were calculated for each of the residential areas based on the average noise levels experienced and their residential density. Scoring results were used to rank potential residential areas based on cost-effectiveness of noise mitigation, and with a scoring adjustment based on existing noise level.
 - Cost effectiveness considerations were factored into the analysis. For each residential area, the estimated cost of constructing the proposed noise wall was calculated. Using FHWA cost effectiveness guidelines, adjusted for inflation, it was concluded by MnDOT that the implementation of noise mitigation would only be reasonable in areas where the cost effectiveness was less than or equal to \$43,500 per benefitted residence.

- In addition to cost effectiveness, existing sound intensity was included in the prioritization calculation. For residential properties that exceed the daytime L10 standard of 65 dBA, the following adjustment was applied to the cost/residence:

Adjusted Cost/Residence

$$=CE/(2^{\frac{L_{10} \text{ monitored level} - 65 \text{ (daytime standard)}}{10}})$$

The result of this adjustment places more emphasis on residential sites with higher noise levels, adjusting their score and improving that location's position in the prioritization.

Based on this methodology, a metro wide inventory of residential areas was developed. This inventory ranks residential areas on the basis of noise impacts experienced and the cost effectiveness of potential noise mitigation.

STUDY RESULTS AND CONCLUSIONS

- A total of 235 residential areas in the metro area were included in the noise analysis.
- All of the 235 residential areas included in the study are located inside the 8 county metro area served by MnDOT's Metro District. This area includes Anoka, Carver, Chisago, Dakota, Hennepin, Ramsey, Scott and Washington counties.
- Thirty-two residential areas with the highest noise levels and residential densities were found to be cost effective for noise mitigation. These 31 areas are located along approximately 8 residential miles of freeways and expressways.
- Tables on the following pages, and a figure in the Appendix, show the locations and priority rankings of the 31 residential areas identified as top priority areas for possible future noise mitigation.
- Tables in the Appendix of this report show the locations and rankings of all 235 residential areas studied in this report.

**TABULATION OF THE TOP 31 POTENTIAL NOISE ABATEMENT AREAS
SORTED BY THEIR BARRIER CONSTRUCTION REASONABLENESS RANKING**

2016 Ranking	TH	Mile Res.	Res. No.	L10 Avg.	Density ¼ Mi.Res.	City	Address	Priority Study Start	Priority Study End	Loc	Cost/Res.	Cost Effective	Intensity Adjustment Score	Intensity Adjusted Cost/Res.
1	35E	0.38	37	76.5	48.5	BURNSVILLE	14052 PLYMOUTH AVE.	E OF CR 42	W OF PORTLAND AVE	E	\$22,387	YES	2.22	\$10,088
2	13	0.16	34	65.5	106.3	BURNSVILLE	11639 KENNELLY CIR	HORIZON DR	117TH ST E	S	\$11,079	YES	1.04	\$10,702
3	94	0.19	21	70.5	55.9	ST PAUL	1476 CONCORDIA AVE	EAST OF SNELLING AVE	PASCAL ST N	S	\$19,364	YES	1.46	\$13,226
4	94	0.12	14	70.8	60.6	ST PAUL	410 CONCORDIA AVE.	ARUNDEL ST	WESTERN AVE N	S	\$23,250	YES	1.49	\$15,554
5	94	0.17	16	69.3	47.1	ST PAUL	1630 CONCORDIA AVE	PIERCE ST N	SNELLING AVE N	S	\$23,936	YES	1.35	\$17,767
6	35E	0.11	8	74.5	36.6	EAGAN	2005 SAFARI TRL	SAFARI TRAIL	SOUTH OF BERKSHIRE	S	\$35,524	YES	1.93	\$18,388
7	10	0.15	11	73.8	36.8	RAMSEY	6545 HWY 10	SUNFISH LAKE BLVD NW	E OF 137TH AVE NW	N	\$35,080	YES	1.84	\$19,061
8	47	0.30	27	67.4	45.5	MINNEAPOLIS	302 35TH AVE NE	37TH AVE NE	S OF 3RD ST NE	W	\$23,663	YES	1.18	\$20,037
9	169	0.12	8	75.5	32.7	EDINA	6956 LANGFORD DR.	LANGFORD DR	N. OF LINCOLN DR	E	\$43,124	YES	2.07	\$20,827
10	10	0.19	12	73.8	31.3	ANOKA	2504 5TH AVE	N 5TH AVE	E OF 6TH AVE	S	\$38,558	YES	1.84	\$20,951
11	169	0.60	34	72.9	28.6	EDINA	6725 SIOUX TR.	VALLEY VIEW RD	INPLACE WALL (APACHE RD)	E	\$38,093	YES	1.73	\$21,980
12	35E	0.30	18	70.3	29.8	EAGAN	1941 BERKSHIRE DR.	NE OF INPLACE BERM	S OF PLAZA DR	S	\$36,478	YES	1.44	\$25,263
13	61	0.87	44	72.4	25.2	COTTAGE GROVE	7704 E PT DOUGLAS RD	S OF HEFNER AVE S	S OF 90TH ST S	E	\$42,389	YES	1.67	\$25,439
14	35E	0.16	10	70.5	31.5	EAGAN	1481 ENGLERT RD	S OF ENGLERT RD	N POND VIEW PT	E	\$37,253	YES	1.46	\$25,445
15	10	0.42	22	71.9	25.9	ARDEN HILLS	4633 HWY 10 SERVICE ROAD	LUMBER YARD	CO RD 96	W	\$41,731	YES	1.61	\$25,927
16	47	0.13	9	67.8	35.3	FRIDLEY	5859 3RD AVE NE	59TH ST	58TH ST	W	\$33,697	YES	1.21	\$27,752
17	62	0.24	15	68.2	30.9	EDINA	6336 FALCON CT	E OF RED FOX CT	BREDESEN PARK	N	\$35,309	YES	1.25	\$28,220
18	7	0.09	7	70.8	38.9	MINNETONKA	17101 HWY 7	W OF CARLYSLE PL	E OF CARLYSLE PL	S	\$42,220	YES	1.49	\$28,244
19	35	0.13	8	68.3	31.3	LAKEVILLE	48 ANITA LANE	STEVEN LN	JAMES LN	W	\$35,954	YES	1.26	\$28,603
20	169	0.70	39	68.7	27.7	NEW HOPE	9403 BASS CREEK CIR. N.	N. OF BASS LAKE RD	S. OF 63RD AVE N	E	\$38,589	YES	1.30	\$29,777
21	36	0.15	10	68.0	33.7	NO ST PAUL	2701 15TH AVE E	GENEVA AVE N (120)	W OF HENRY ST N	N	\$36,847	YES	1.23	\$29,929
22	169	0.10	6	69.7	30.1	ST.LOUIS PK.	2944 INDEPENDENCE AVE	HILLSBORO AVE S	R/R TRACKS	E	\$42,135	YES	1.38	\$30,525
23	36	0.50	25	70.0	24.8	ROSEVILLE	880 HWY 36 W	LEXINGTON AVE N	VICTORIA ST N	S	\$43,401	YES	1.41	\$30,689
24	47	0.30	15	69.7	25.3	FRIDLEY	6240 SUNRISE DR. NE.	61ST AVE NE	MISSISSIPPI ST NE	W	\$43,235	YES	1.38	\$31,323
25	10	0.12	7	66.5	29.8	ANOKA	721 POLK ST	7TH AVE	8TH AVE	S	\$35,420	YES	1.11	\$31,922
26	694	0.21	13	65.8	30.9	NEW BRIGHTON	2910 TORCHWOOD DR.	BERNE CIR E	W. OF FOREST DALE RD	S	\$35,563	YES	1.06	\$33,645
27	169	0.56	30	66.5	26.9	MINNETONKA	9608 ROBIN OAK RD.	FORD PARK	CEDAR LAKE RD	W	\$40,605	YES	1.11	\$36,511
28	13	0.28	14	67.3	25.4	BURNSVILLE	11430 GALTIER DR	MID KEATING AVE	GALTIER DR	S	\$43,048	YES	1.17	\$36,704
29	149	0.17	10	66.5	28.7	EAGAN	3280 DODD RD	CHAPEL LN	ADVANTAGE LN	N	\$40,904	YES	1.11	\$36,865
30	62	0.23	14	66.0	30.8	EDINA	6645 MCCAULEY TR. W.	TIMBER TRAIL	W. OF GLEASON AVE	S	\$41,757	YES	1.07	\$38,961
31	169	0.16	9	65.3	28.7	ST.LOUIS PK.	1440 JORDAN AVE S	S. OF I-394	FORD PARK	W	\$41,434	YES	1.02	\$40,581

NEXT STEPS

Based on study results and conclusions, the following next steps are proposed for addressing highway noise mitigation needs and priorities:

- 1. MnDOT will continue with preliminary design and final design studies to ensure that proposed noise wall construction is determined to be feasible, reasonable and cost effective.**

Factors to be considered include:

- Right of way
 - Highway safety and maintenance
 - Soils in the project area
 - Driver sight distances near intersections
 - Hydraulics, drainage features and wetland areas
 - Buried utilities or utility relocation needs
- 2. MnDOT will continue working with municipalities, residents and area transportation partners in those priority areas where noise wall construction is being proposed. This work will include an assessment of the public's acceptance of the proposed noise wall(s).**

MnDOT will notify those municipalities where a potentially proposed noise wall is near the top of the priority list. MnDOT will request a City Council resolution indicating its desire to have mitigation considered and constructed if the wall is found to be reasonable and feasible. This process will include disclosure of the community's responsibility for 10% of the costs for construction and contract administration/construction oversight. Municipalities are encouraged to hold

public meetings to determine if residents in affected communities want the noise mitigation.

Areas which do not obtain City Council resolutions supporting construction of noise walls, or cannot reach a decision in a reasonable amount of time, will be dropped from MnDOT's priority ranking of residential areas for noise mitigation.

- 3. MnDOT will develop cost estimates and identify funding for top ranking sites identified in this priority study by working through the State Transportation Improvement Program (STIP) investment process. MnDOT will have discretionary authority over the use of state funds.**

Currently, MnDOT Metro District has allotted approximately \$2 million per year to spend on standalone highway noise abatement projects. The top ranking sites in this priority study will be initiated and managed through the STIP investment process starting in fiscal Year 2021.

Additionally, federal and state funds will continue to be sought for any noise mitigation needed in conjunction with proposed new highway construction and major reconstruction projects.

Projects and activities identified in the STIP have been developed consistent with the policy statements and directions included in the Department's Statewide Transportation Plan (STP).

- 4. MnDOT will continue working with local units of government to coordinate land use development in conjunction with transportation facilities.**

MnDOT's policy is to assist local governments in promoting compatibility between land use and highways. Residential uses located adjacent to highways often result in complaints about traffic noise. Traffic noise from highways and/or interstates could exceed noise standards established by the Minnesota Pollution Control Agency (MPCA), the U.S. Department of Housing and Urban

Development, and the U.S. Department of Transportation. Minnesota Rule 7030.0030 states that municipalities are responsible for taking all reasonable measures to prevent land use activities listed in the MPCA's Noise Area Classification (NAC) where the establishment of the land use would result in violations of established noise standards.

CONCLUSION

This report documents the results of the noise analysis that was undertaken by MnDOT's Metro District to reassess and expand, for the metro area, the noise impact prioritization.

The information, results, conclusions and next steps presented in this report are intended to provide a framework for working with municipalities, residents and transportation partners to make cost effective decisions for minimizing highway noise impacts in Minnesota.

Appendix

Appendix

**MPCA LETTER OF SUPPORT FOR THE MINNESOTA
HIGHWAY NOISE ABATEMENT STUDY**



Minnesota Pollution Control Agency

520 Lafayette Road North | St. Paul, Minnesota 55155-4194 | 651-296-6300

800-657-3864 | Use your preferred relay service | info.pca@state.mn.us | Equal Opportunity Employer

June 8, 2016

Mr. Scott McBride, District Engineer
Minnesota Department of Transportation
Metropolitan District Waters Edge Building
1500 West County Road B-2
Roseville, MN 55113-3174

Dear Mr. McBride:

The Minnesota Pollution Control Agency (MPCA) is pleased to see that the Minnesota Department of Transportation (MnDOT) is updating its Metro District 2016 Highway Noise Abatement Study. The original study has proved to be valuable in the past 19 years to determine the priority of areas that will receive retro-fit (also known as standalone) noise mitigation. The MPCA references the study when requested to assess the existing noise levels and cost effectiveness of noise mitigation in residential areas.

The MPCA supports MnDOT's decision to use the study results as a basis to prioritize retro-fit noise abatement projects metro area. Since 1997, when the study was first published, the MPCA and MnDOT realized the dynamic nature of roadway noise in the metro area and recognized the need for periodic updates to the study. The MPCA noise program agrees with the process used to update existing noise levels, and residential home density values that MnDOT used to reassess the priority of noise mitigation projects. The MPCA is also in concurrence with the updates that now incorporate the current cost/effectiveness threshold, and incorporate existing noise level intensity into the prioritization calculation.

The MPCA has conferred with MnDOT on the modifications to the ranking of each area's total score and agrees with the study's conclusions. The MPCA strongly encourages MnDOT's work with its transportation partners in exploring various means to fund construction of qualifying projects identified in the study.

The MPCA would like to acknowledge the MnDOT staff for their efforts in collecting, analyzing and evaluating the large amount of data upon which the study is based. The MPCA thanks you for the opportunity to participate in the update of the MnDOT Metro District 2016 Highway Noise Abatement Study.

Sincerely,

A handwritten signature in black ink that reads "Mary Jean Fenske".

Mary Jean Fenske
Supervisor, Air Policy Unit
St. Paul Office
Environmental Analysis and Outcomes Division

MJF\MK:vs

Appendix

1997 NOISE ABATEMENT STUDY METHODOLOGY

Areas covered:

For the 1997 Noise Abatement Study, MnDOT conducted noise monitoring at over 800 residential areas adjacent to freeways and expressways in incorporated areas in accordance with state legislative statute. The noise monitoring was performed using procedures outlined in Minn. Rules ch.7030.0060, Measurements Methodology.

Methodology:

Monitoring methods in terms of where and how

Noise monitoring was done using certified Sound Level Meters (SLMs) to measure the L10 at a residence that represented all nearby residences that were similar in their proximity to the highway being measured, in intervening terrain and where traffic flow was the same.

The SLM was located on the highway side of the residence at a location where outdoor activity on that side of the residence would have a high probability of occurring. At the same time, the SLM could not be too close to large reflecting surfaces, usually no less than 20 ft. away. Two measurements were done. A measurement was done during the hours of 7 am to 11 am and another between the hours of 1 pm to 5 pm. If the forenoon and afternoon measurements were within 2 dBA of one another, they were averaged and the average was used as the representative L10 level. If the measurements were not within 2 dBA, several more measurements were made until closure was achieved or it became clear that traffic was too light and variable to allow closure in a reasonable amount of time. At sites where closure was not possible, an overall average of available measurements was used. Invariably, the few areas where closure wasn't achieved had low noise levels and traffic flows, leading to low noise impacts.

After an average representative L10 measurement was acquired, the length along the highway of the represented residential area was determined. This residential length, along with a count of the number of represented residences was used to calculate the residential density (residences per length) of the area. The residential densities of all areas were then normalized to the number of residences in a half-mile.

Ranking methods and procedures to determine priorities

The priority ranking for residential areas was done using a procedure developed by MnDOT (see form EXISTING ROAD (RETROFIT) NOISE BARRIER STUDY at the end of this appendix). This scoring procedure was used to rank the different areas on the basis of noise level and residential density. An initial ranking based on an area's overall reasonableness scoring, using noise level and residential density, was done. The residential areas would be scored as high, medium or low on the basis of their reasonableness scoring. Then, all those areas where a noise wall would not be cost effective, based on MnDOT's maximum cost effectiveness limit of \$3250 of wall cost per residence per dBA of reduction, were dropped from consideration. Then a second ranking based on the reasonability ranking, weighted by cost effectiveness, of the remaining areas was done. In this way, those areas that didn't meet the cost effectiveness criteria were eliminated and a final ranking, based on overall reasonableness scoring weighted by cost effectiveness, was determined.

Benefit/cost methods to determine optimal opportunities for mitigation

Cost effectiveness is considered to be an important factor in determining the reasonableness of noise wall construction. The limiting cost effectiveness amount of \$3250/residence/dBA of reduction is based on FHWA cost effectiveness values that have been corrected from time to time to account for price and construction cost changes over the years. MnDOT's cost effectiveness value falls within the range of the latest cost effectiveness values quoted by the FHWA. MnDOT prefers to continue the use of a cost per decibel

of reduction per residence as the unit of measure for cost effectiveness, rather than the FHWA's latest suggestion of cost per residence. It should be remembered that the cost effectiveness limit is a guideline value, not a statutory or regulatory limit.

In the noise abatement study, a noise wall's cost effectiveness was estimated using an assumed, typical terrain between the roadway and receiver. While an assumed terrain won't accurately represent all residential areas, the values are expected to be close enough to actual values so as to allow for a first ranking. A noise wall height of 20 feet was assumed for the entire anticipated length of a noise wall. The 20 foot height and the estimated wall length allow for the calculation of a noise wall's area. The application of a cost of \$15 per square foot was then applied and in this way, an estimated wall cost for each area was determined. MnDOT uses this cost when factors such as noise wall material, noise wall type, soil characteristics, engineering costs, mobilization costs, etc. are unknown. Using this estimated wall cost along with noise level reductions, residential density, noise wall geometry and end effects, a cost effectiveness value was determined for the noise wall under consideration. When listed areas are looked at in greater detail as they come up for possible construction, the cost effectiveness values could be refined and be different than those used in the study. For example, the estimated length of a noise wall could differ from a final actual length used. The diffraction effects used are approximate. Any cost effectiveness changes due to later, more detailed analysis would be taken in to account at the time of final detailed analysis.

Appendix

MINNESOTA NOISE POLLUTION STATUTE 116.07

Minn. Stat. § 116.07 POWERS AND DUTIES.

Subdivision 1. **Generally.**

In addition to any powers or duties otherwise prescribed by law and without limiting the same, the Pollution Control Agency shall have the powers and duties hereinafter specified.

Subd. 2. **Adoption of standards.** (c) The Pollution Control Agency shall also adopt standards describing the maximum levels of noise in terms of sound pressure level which may occur in the outdoor atmosphere, recognizing that due to variable factors no single standard of sound pressure is applicable to all areas of the state. Such standards shall give due consideration to such factors as the intensity of noises, the types of noises, the frequency with which noises recur, the time period for which noises continue, the times of day during which noises occur, and such other factors as could affect the extent to which noises may be injurious to human health or welfare, animal or plant life, or property, or could interfere unreasonably with the enjoyment of life or property. In adopting standards, the Pollution Control Agency shall give due recognition to the fact that the quantity or characteristics of noise or the duration of its presence in the outdoor atmosphere, which may cause noise pollution in one area of the state, may cause less or not cause any noise pollution in another area of the state, and it shall take into consideration in this connection such factors, including others which it may deem proper, as existing physical conditions, zoning classifications, topography, meteorological conditions and the fact that a standard which may be proper in an essentially residential area of the state, may not be proper as to a highly developed industrial area of the state. Such noise standards shall be premised upon scientific knowledge as well as effects based on technically substantiated criteria and commonly accepted practices. No local governing unit shall set standards describing the maximum levels of sound pressure which are more stringent than those set by the Pollution Control Agency.

Appendix

State Statute 116.07, Subd. 2a.Exemptions from standards.

State Statute 116.07, Subd. 2a.Exemptions from standards.

No standards adopted by any state agency for limiting levels of noise in terms of sound pressure which may occur in the outdoor atmosphere shall apply to (1) segments of trunk highways constructed with federal interstate substitution money, provided that all reasonably available noise mitigation measures are employed to abate noise, (2) an existing or newly constructed segment of a highway, provided that all reasonably available noise mitigation measures, as approved by the commissioners of the Department of Transportation and Pollution Control Agency, are employed to abate noise, (3) except for the cities of Minneapolis and St. Paul, an existing or newly constructed segment of a road, street, or highway under the jurisdiction of a road authority of a town, statutory or home rule charter city, or county, except for roadways for which full control of access has been acquired, (4) skeet, trap or shooting sports clubs, or (5) motor vehicle race events conducted at a facility specifically designed for that purpose that was in operation on or before July 1, 1996. Nothing herein shall prohibit a local unit of government or a public corporation with the power to make rules for the government of its real property from regulating the location and operation of skeet, trap or shooting sports clubs, or motor vehicle race events conducted at a facility specifically designed for that purpose that was in operation on or before July 1, 1996.

**CHAPTER 7030: MINNESOTA POLLUTION CONTROL AGENCY'S NOISE
STANDARDS, RULES, DEFINITIONS AND MEASUREMENT METHODOLOGY**

CHAPTER 7030, NOISE POLLUTION CONTROL

MINNESOTA POLLUTION CONTROL AGENCY

Part	Title
7030.0010	INCORPORATION BY REFERENCE.
7030.0020	DEFINITIONS.
7030.0030	NOISE CONTROL REQUIREMENT.
7030.0040	NOISE STANDARDS.
7030.0050	NOISE AREA CLASSIFICATION.
7030.0060	MEASUREMENT METHODOLOGY.
7030.0070	SOUND ATTENUATION MEASUREMENT METHODOLOGY.
7030.0080	VARIANCE.
	MOTOR VEHICLE NOISE LIMITS
7030.1000	DEFINITION.
7030.1010	PROHIBITIONS.
7030.1020	SCOPE.
7030.1030	EXCEPTIONS.
7030.1040	NOISE LIMIT FOR VEHICLES OVER 10,000 POUNDS.
7030.1050	MOTOR VEHICLE NOISE LIMITS FOR MOTORCYCLES.
7030.1060	NOISE LIMITS FOR OTHER VEHICLES.

GENERALLY

7030.0010 INCORPORATION BY REFERENCE.

For the purpose of chapter 7030, American National Standards Institute, Specification for Sound Level Meters, S1.4-1983 is incorporated by reference. This publication is available from the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018 and can be found at: the offices of the Minnesota Pollution Control Agency, 1935 West County Road B-2, Roseville, Minnesota 55113; the Government Documents Section, Room 409, Wilson Library, University of Minnesota, 309 19th Avenue South, Minneapolis, Minnesota 55454; and the State of Minnesota Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155. This document is not subject to frequent change.

The Federal Highway Administration publication, Sound Procedures for Measuring Highway Noise: Final Report, FHWA-DP-45-1R (August 1981) is incorporated by reference. This publication is available from the United States Department of Transportation, Federal Highway Administration, 1000 North Globe Road, Arlington, Virginia 22201 and can be found at: the offices of the Minnesota Pollution Control Agency, 1935 West County Road B-2, Roseville, Minnesota 55113; the Government Documents Section, Room 409, Wilson Library, University of Minnesota, 309 19th Avenue South, Minneapolis, Minnesota 55454; and the State of Minnesota Law Library, 25 Rev. Dr. Martin Luther King Jr. Blvd., Saint Paul, Minnesota 55155. This document is not subject to frequent change.

Statutory Authority:

MS s 116.07

History:

11 SR 43; 18 SR 614

Published Electronically:

December 12, 2003

7030.0020 DEFINITIONS.

Subpart 1 **.Application.** The terms used in this chapter have the meanings given them in this part.

Subp. 2. **A-weighted.** "A-weighted" means a specific weighting of the sound pressure level for the purpose of determining the human response to sound. The specific weighting characteristics and tolerances are those given in American National Standards Institute S1.4-1983, section 5.1.

Subp. 3. **Daytime.** "Daytime" means those hours from 7:00 a.m. to 10:00 p.m.

Subp. 4. **dB (A).** "dB(A)" means a unit of sound level expressed in decibels (dB) and A-weighted.

Subp. 5. **Decibel.** "Decibel" means a unit of sound pressure level, abbreviated as dB.

Subp. 6. **Impulsive noise.** "Impulsive noise" means either a single sound pressure peak (with either a rise time less than 200 milliseconds or total duration less than 200 milliseconds) or multiple sound pressure peaks (with either rise times less than 200 milliseconds or total duration less than 200 milliseconds) spaced at least by 200 millisecond pauses.

Subp. 7.**L₁₀**. "L₁₀" means the sound level, expressed in dB(A), which is exceeded ten percent of the time for a one hour survey, as measured by test procedures approved by the commissioner.

Subp. 8.**L₅₀**. "L₅₀" means the sound level, expressed in dB(A), which is exceeded 50 percent of the time for a one hour survey, as measured by test procedures approved by the commissioner.

Subp. 9.**Municipality**. "Municipality" means a county; a city; a town; a regional planning and development commission established under Minnesota Statutes, chapter 473; the metropolitan council; or other governmental subdivision of the state responsible by law for controlling or restricting land use within its jurisdiction.

Subp. 10.**Nighttime**. "Nighttime" means those hours from 10:00 p.m. to 7:00 a.m.

Subp. 11.**Person**. "Person" means any human being, any municipality or other governmental or political subdivision or other public department or agency, any public or private corporation, any partnership, firm, association, or other organization, any receiver, trustee, assignee, agency, legal entity, other than a court of law, or any legal representative of any of the foregoing, but does not include the agency.

Subp. 12.**Sound pressure level**. "Sound pressure level", in decibels, means

20 times the logarithm to the base 10 of the ratio of the pressure to the reference pressure. The reference pressure shall be 20 micronewtons per square meter.

Statutory Authority:

MS s [116.07](#)

History:

11 SR 43; L 1987 c 186 s 15; 18 SR 614

Published Electronically:

December 12, 2003

7030.0030 NOISE CONTROL REQUIREMENT.

No person may violate the standards established in part [7030.0040](#), unless exempted by Minnesota Statutes, section [116.07](#), subdivision 2a. Any municipality having authority to regulate land use shall take all reasonable measures within its jurisdiction to prevent the establishment of land use activities listed in noise area classification (NAC) 1, 2, or 3 in any location where the standards established in part [7030.0040](#) will be violated immediately upon establishment of the land use.

Statutory Authority:

MS s [116.07](#)

History:

11 SR 43; 18 SR 614

Published Electronically:

December 12, 2003

7030.0040 NOISE STANDARDS.

Subpart 1. **Scope.** These standards describe the limiting levels of sound established on the basis of present knowledge for the preservation of public health and welfare. These standards are consistent with speech, sleep, annoyance, and hearing conservation requirements for receivers within areas grouped according to land activities by the noise area classification (NAC) system established in part 7030.0050. However, these standards do not, by themselves, identify the limiting levels of impulsive noise needed for the preservation of public health and welfare. Noise standards in subpart 2 apply to all sources.

Subp. 2.Noise standards.

Noise Area Classification	Daytime		Nighttime	
	L ₅₀	L ₁₀	L ₅₀	L ₁₀
1	60	65	50	55
2	65	70	65	70
3	75	80	75	80

Statutory Authority:

MS s 116.07

History:

11 SR 43; 18 SR 614

Published Electronically:

December 12, 2003

7030.0050 NOISE AREA CLASSIFICATION.

Subpart 1. **Applicability.** The noise area classification is based on the land use activity at the location of the receiver and determines the noise standards applicable to that land use activity unless an exception is applied under subpart 3.

Subp. 2. **Noise area classifications.** The noise area classifications and the activities included in each classification are listed below:

Noise Area Classification Land Use Activities

- | | |
|---|---|
| 1 | Household Units (includes farm houses) |
| | Group quarters |
| | Residential hotels |
| | Mobile home parks or courts |
| | Transient lodging |
| | Other residential |
| | Motion picture production |
| | Medical and other health services |
| | Correctional institutions |
| | Educational services |
| | Religious activities |
| | Cultural activities and nature exhibitions |
| | Entertainment assembly |
| | Camping and picnicking areas (designated) |
| | Resorts and group camps |
| | Other cultural, entertainment, and recreational activities. |
| 2 | Railroad terminals (passenger) |
| | Railroad terminals (passenger and freight) |

Rapid rail transit and street railway passenger terminals

Bus passenger terminals (intercity)

Bus passenger terminals (local)

Bus passenger terminals (intercity and local)

Other motor vehicle transportation

Airport and flying field terminals (passenger)

Airport and flying field terminals (passenger and freight)

Marine terminals (passenger)

Marine terminals (passenger and freight)

Automobile parking

Telegraph message centers

Transportation services and arrangements

Wholesale trade

Retail trade -- building materials, hardware, and farm equipment

Retail trade -- general merchandise

Retail trade -- food

Retail trade -- automotive, marine craft, aircraft, and accessories

Retail trade -- apparel and accessories

Retail trade -- furniture, home furnishings, and equipment

Retail trade -- eating and drinking

Other retail trade

Finance, insurance, and real estate services

Personal services

Business services

Repair services

Legal services

Other professional services

Contract construction services

Governmental services (except correctional institutions)

Miscellaneous services (except religious activities)

Public assembly (except entertainment assembly and race tracks)

Amusements (except fairgrounds and amusement parks)

Recreational activities (except designated camping and picnicking areas)

Parks.

3 Food and kindred products -- manufacturing

Textile mill products -- manufacturing

Apparel and other finished products made from fabrics, leather, and similar materials -- manufacturing

Lumber and wood products (except furniture) -- manufacturing

Furniture and fixtures -- manufacturing

Paper and allied products -- manufacturing

Printing, publishing, and allied industries

Chemicals and allied products -- manufacturing

Petroleum refining and related industries

Rubber and miscellaneous plastic products -- manufacturing

Stone, clay, and glass products -- manufacturing

Primary metal industries

Fabricated metal products -- manufacturing

Professional, scientific, and controlling instruments; photographic
and optical goods; watches and clocks -- manufacturing

Miscellaneous manufacturing (except motion picture production)

Railroad, rapid transit, and street railway transportation (except
passenger terminals)

Motor vehicle transportation (except passenger terminals)

Aircraft transportation (except passenger terminals)

Marine craft transportation (except passenger and freight
terminals)

Highway and street right-of-way

Communication (except telegraph message centers)

Utilities

Other transportation, communication, and utilities (except
transportation services and arrangements)

Race tracks

Fairgrounds and amusement parks

Agricultural

Agricultural and related activities

Forestry activities and related services (including commercial forest land, timber production, and other related activities)

Fishing activities and related services

Mining activities and related services

Other resource production and extraction

All other activities not otherwise listed.

4 Undeveloped and unused land area (excluding noncommercial forest development)

Noncommercial forest development

Water areas

Vacant floor area

Under construction

Other undeveloped land and water areas.

Subp. 3. **Exceptions.** The noise area classification for a land use may be changed in the following ways if the applicable conditions are met.

A. The daytime standards for noise area classification 1 shall be applied to noise area classification 1 during the nighttime if the land use activity does not include overnight lodging.

B. The standards for a building in a noise area classification 2 shall be applied to a building in a noise area classification 1 if the following conditions are met:

(1) the building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dB(A);

(2) the building has year-round climate control; and

(3) the building has no areas or accommodations that are intended for outdoor activities.

C. The standards for a building in a noise area classification 3 shall be applied to a building in a noise area classification 1 if the following conditions are met:

the building is constructed in such a way that the exterior to interior sound level attenuation is at least 40 dB(A);

the building has year-round climate control; and

the building has no areas or accommodations that are intended for outdoor activities.

D. The standards for a building in a noise area classification 3 shall be applied to a building in a noise area classification 2 if the following conditions are met:

the building is constructed in such a way that the exterior to interior sound level attenuation is at least 30 dB(A);

the building has year-round climate control; and

the building has no areas or accommodations that are intended for outdoor activities.

Statutory Authority:

MS s 116.07

History:

11 SR 43; 18 SR 614

Published Electronically:

December 12, 2003

7030.0060 MEASUREMENT METHODOLOGY.

Subpart 1. **Measurement location.** Measurement of sound must be made at or within the applicable NAC at the point of human activity which is nearest to the noise source. All measurements shall be made outdoors.

Subp. 2. **Equipment specifications.** All sound level measuring devices must meet Type O, I, II, or S specifications under American National Standards Institute S1.4-1983.

Subp. 3. **Calibration.** All sound level measuring devices must, at a minimum, be externally field calibrated before and after monitoring using a calibration device of known frequency and sound pressure level.

Subp. 4. **Measurement procedures.** The following procedures must be used to obtain representative sound level measurements:

Measurements must be made at least three feet off the ground or surface and away from natural or artificial structures which would prevent an accurate measurement.

Measurements must be made using the A-weighting and fast response characteristics of the sound measuring device as specified in American National Standards Institute S1.4-1983.

Measurements must not be made in sustained winds or in precipitation which results in a difference of less than ten decibels between the background noise level and the noise source being measured.

Measurements must be made using a microphone which is protected from ambient conditions which would prevent an accurate measurement.

Subp. 5.**Data documentation.** A summary sheet for all sound level measurements shall be completed and signed by the person making the measurements. At a minimum, the summary sheet shall include:

- A. date;
- B. time;
- C. location;
- D. noise source;
- E. wind speed and direction;
- F. temperature;
- G. humidity;
- H. make, model, and serial number of measuring equipment;
- I. field calibration results;
- J. monitored levels; and
- K. site sketch indicating noise source, measurement location, directions, distances, and obstructions.

Statutory Authority:

MS s [116.07](#)

History:

11 SR 43; 17 SR 1279; 18 SR 614

Published Electronically:

December 12, 2003

7030.0070 SOUND ATTENUATION MEASUREMENT METHODOLOGY.

Subpart 1. **Purpose.** Sound level measurements made for assessing sound attenuation as specified in part [7030.0050](#), subpart 3, item B, C, or D, shall be made according to the requirements of this part.

Subp. 2. **Equipment.** The equipment shall meet the requirements specified in part [7030.0060](#), subpart 2.

Subp. 3. **Calibration.** The equipment must meet the calibration requirements specified in part [7030.0060](#), subpart 3.

Subp. 4. **Measurement procedure.** The measurement procedure described in FHWA-DP-45-1R, section 8 must be used for determination of the sound attenuation.

Subp. 5. **Equivalent methods.** Methods equivalent to those described in subpart 4 may be used provided they are approved by the commissioner of the Minnesota Pollution Control Agency. The commissioner shall approve an alternative method if the commissioner finds that the method will produce representative data and results which are as reliable as the methods specified in subpart 4.

Statutory Authority:

MS s [116.07](#)

History:

11 SR 43; L 1987 c 186 s 15; 18 SR 614

Published Electronically:

December 12, 2003

7030.0080 VARIANCE.

If, upon written application of the responsible person, the agency finds that by reason of exceptional circumstances strict conformity with any provisions of any noise rule would cause undue hardship, would be unreasonable, impractical, or not feasible under the circumstances, the agency may permit a variance upon the conditions and within the time limitations as it may prescribe for the prevention, control, or abatement of noise pollution in harmony with the intent of the state and any applicable federal laws.

Statutory Authority:

MS s [116.07](#)

History:

11 SR 43; 18 SR 614

Published Electronically:

December 12, 2003

MOTOR VEHICLE NOISE LIMITS

7030.1000 DEFINITION.

"Motor vehicle" means any self-propelled vehicle not operated exclusively

upon railroad tracks and any vehicle propelled or drawn by a self-propelled vehicle and includes vehicles known as trackless trolleys which are propelled by electric power obtained from overhead trolley wires but not operated upon rails, except snowmobiles.

Statutory Authority:

MS s [116.07](#)

History:

18 SR 614

Published Electronically:

December 12, 2003

7030.1010 PROHIBITIONS.

Subpart 1. **Operation of vehicle.** No person shall operate either a motor vehicle or combination of vehicles of a type subject to registration pursuant to Minnesota Statutes, chapter 168 at any time or under any condition of grade, load, acceleration, or deceleration in such a manner as to exceed the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the commissioner.

Subp. 2. **Sale of vehicle.** No person shall sell or offer for sale a new motor vehicle or combination of vehicles of a type subject to registration pursuant to Minnesota Statutes, chapter 168 which when maintained according to the manufacturer's specifications would exceed the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the commissioner.

Subp. 3. **Modification of vehicle.** No person shall modify a motor vehicle or combination of vehicles of a type subject to registration pursuant to

Minnesota Statutes, chapter 168 in a manner which will amplify or increase the noise emitted by the vehicle, above the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the commissioner. No person shall operate a motor vehicle so modified.

Subp. 4. **Sale of parts.** No person shall sell or offer for sale replacement or additional parts for a motor vehicle or combination of vehicles of a type subject to registration pursuant to Minnesota Statutes, chapter 168 which when installed in the vehicle will amplify or increase the noise emitted by the vehicle, above the noise limits contained herein for the category of motor vehicle and speed limits specified, when tested with a measurement procedure approved by the commissioner. No person shall operate a motor vehicle incorporating such parts.

Statutory Authority:

MS s [116.07](#)

History:

L 1987 c 186 s 15; 18 SR 614

Published Electronically:

December 12, 2003

7030.1020 SCOPE.

This chapter applies to the total noise from a vehicle or combination of vehicles of a type subject to registration pursuant to Minnesota Statutes, chapter 168 and shall not be construed as limiting or precluding the enforcement of any other provision of law relating to motor vehicle exhaust noise.

Statutory Authority:

MS s [116.07](#)

History:

18 SR 614

Published Electronically:

December 12, 2003

7030.1030 EXCEPTIONS.

Vehicles under parts [7030.1050](#) and [7030.1060](#) are allowed to exceed the noise limits contained herein when performing acceleration maneuvers for safety purposes.

Statutory Authority:

MS s [116.07](#)

History:

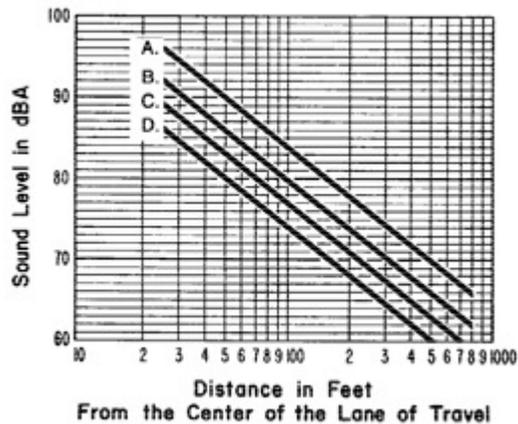
18 SR 614

Published Electronically:

December 12, 2003

7030.1040 NOISE LIMIT FOR VEHICLES OVER 10,000 POUNDS.

Motor vehicle noise limits for vehicles with a manufacturer's gross vehicle weight rating of more than 10,000 pounds and any combination of vehicles towed by such motor vehicle.



- A. Speed limits greater than 35 mph.
- B. Speed limits equal to or less than 35 mph and stationary run-up tests (for vehicles with governed engines). For stationary run-up tests on all-paved surfaces, add 2 dBA.
- C. Speed limits equal to or less than 35 mph and stationary run-up tests (for vehicles with governed engines), for vehicles manufactured on or after January 1, 1978. For stationary run-up tests on all-paved surfaces, add 2 dBA.
- D. Speed limits equal to or less than 35 mph and stationary run-up tests (for vehicles with governed engines), for vehicles manufactured on or after January 1, 1982. For stationary run-up tests on all-paved surfaces, add 2 dBA.

Statutory Authority:

MS s [116.07](#)

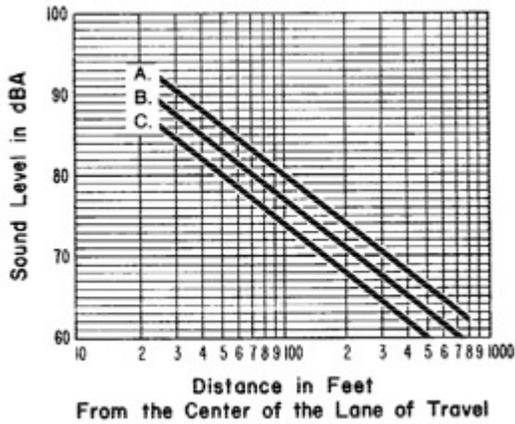
History:

18 SR 614

Published Electronically:

December 12, 2003

7030.1050 MOTOR VEHICLE NOISE LIMITS FOR MOTORCYCLES.



- A. For vehicles manufactured before January 1, 1975.
- B. Speed limits greater than 35 mph for vehicles manufactured on or after January 1, 1975.
- C. Speed limits equal to or less than 35 mph for vehicles manufactured on or after January 1, 1975.

Statutory Authority:

MS s 116.07

History:

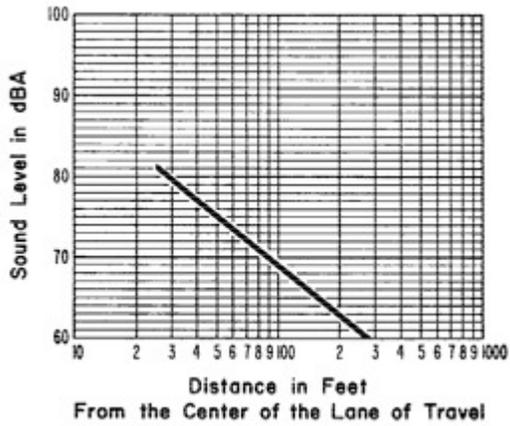
18 SR 614

Published Electronically:

December 12, 2003

7030.1060 NOISE LIMITS FOR OTHER VEHICLES.

Motor vehicle noise limits for any other motor vehicle not included under parts 7030.1040 and 7030.1050 and any combination of vehicles towed by such motor vehicle.



Statutory Authority:

MS s 116.07

History:

18 SR 614

Published Electronically:

December 12, 2003

Appendix

**COMPLETE TABULATION OF ALL METRO AREAS EVALUATED IN THE
NOISE ABATEMENT STUDY**

2016 Ranking	TH	Mile Res.	Res. No.	L10 Avg.	Density 1/4 Mi.Res.	City	Address	Priority Study Start	Priority Study End	Loc	Cost/Res.	Cost Effective	Intensity Adjustment Score	Intensity Adjusted Cost/Res.
1	35E	0.38	37	76.5	48.5	BURNSVILLE	14052 PLYMOUTH AVE.	E OF CR 42	W OF PORTLAND AVE	E	\$22,387	YES	2.22	\$10,088
2	13	0.16	34	65.5	106.3	BURNSVILLE	11639 KENNELLY CIR	HORIZON DR	117TH ST E	S	\$11,079	YES	1.04	\$10,702
3	94	0.19	21	70.5	55.9	ST PAUL	1476 CONCORDIA AVE	EAST OF SNELLING AVE	PASCAL ST N	S	\$19,364	YES	1.46	\$13,256
4	94	0.12	14	70.8	60.6	ST.PAUL	410 CONCORDIA AVE.	ARUNDEL ST	WESTERN AVE N	S	\$23,250	YES	1.49	\$15,554
5	94	0.17	16	69.3	47.1	ST PAUL	1630 CONCORDIA AVE	PIERCE ST N	SNELLING AVE N	S	\$23,936	YES	1.35	\$17,767
6	35E	0.11	8	74.5	36.6	EAGAN	2005 SAFARI TRL	SAFARI TRAIL	SOUTH OF BERKSHIRE	S	\$35,524	YES	1.93	\$18,388
7	10	0.15	11	73.8	36.8	RAMSEY	6545 HWY 10	SUNFISH LAKE BLVD NW	E OF 137TH AVE NW	N	\$35,080	YES	1.84	\$19,061
8	47	0.30	27	67.4	45.5	MINNEAPOLIS	302 35TH AVE NE	37TH AVE NE	S OF 3RD ST NE	W	\$23,663	YES	1.18	\$20,037
9	169	0.12	8	75.5	32.7	EDINA	6956 LANGFORD DR.	LANGFORD DR	N. OF LINCOLN DR	E	\$43,124	YES	2.07	\$20,827
10	10	0.19	12	73.8	31.3	ANOKA	2504 5TH AVE	N 5TH AVE	E OF 6TH AVE	S	\$38,558	YES	1.84	\$20,951
11	169	0.60	34	72.9	28.6	EDINA	6725 SIOUX TR.	VALLEY VIEW RD	INPLACE WALL (APACHE RD)	E	\$38,093	YES	1.73	\$21,980
12	35E	0.30	18	70.3	29.8	EAGAN	1941 BERKSHIRE DR.	NE OF INPLACE BERM	S OF PLAZA DR	S	\$36,478	YES	1.44	\$25,263
13	61	0.87	44	72.4	25.2	COTTAGE GROVE	7704 E PT DOUGLAS RD	S OF HEFNER AVE S	S OF 90TH ST S	E	\$42,389	YES	1.67	\$25,439
14	35E	0.16	10	70.5	31.5	EAGAN	1481 ENGLERT RD	S OF ENGLERT RD	N POND VIEW PT	E	\$37,253	YES	1.46	\$25,445
15	10	0.42	22	71.9	25.9	ARDEN HILLS	4633 HWY 10 SERVICE ROAD	LUMBER YARD	CO RD 96	W	\$41,731	YES	1.61	\$25,927
16	47	0.13	9	67.8	35.3	FRIDLEY	5859 3RD AVE NE	59TH ST	58TH ST	W	\$33,697	YES	1.21	\$27,752
17	62	0.24	15	68.2	30.9	EDINA	6336 FALCON CT	E OF RED FOX CT	BREDESEN PARK	N	\$35,309	YES	1.25	\$28,220
18	7	0.09	7	70.8	38.9	MINNETONKA	17101 HWY 7	W OF CARLYSLE PL	E OF CARLYSLE PL	S	\$42,220	YES	1.49	\$28,244
19	35	0.13	8	68.3	31.3	LAKEVILLE	48 ANITA LANE	STEVEN LN	JAMES LN	W	\$35,954	YES	1.26	\$28,603
20	169	0.70	39	68.7	27.7	NEW HOPE	9403 BASS LAKE CIR. N.	N. OF BASS LAKE RD	S. OF 63RD AVE N	E	\$38,589	YES	1.30	\$29,777
21	36	0.15	10	68.0	33.7	NO ST PAUL	2701 15TH AVE E	GENEVA AVE N (120)	W OF HENRY ST N	N	\$36,847	YES	1.23	\$29,929
22	169	0.10	6	69.7	30.1	ST.LOUIS PK.	2944 INDEPENDENCE AVE	HILLSBORO AVE S	R/R TRACKS	E	\$42,135	YES	1.38	\$30,525
23	36	0.50	25	70.0	24.8	ROSEVILLE	880 HWY 36 W	LEXINGTON AVE N	VICTORIA ST N	S	\$43,401	YES	1.41	\$30,689
24	47	0.30	15	69.7	25.3	FRIDLEY	6240 SUNRISE DR. NE.	61ST AVE NE	MISSISSIPPI ST NE	W	\$43,235	YES	1.38	\$31,323
25	10	0.12	7	66.5	29.8	ANOKA	721 POLK ST	7TH AVE	8TH AVE	S	\$35,420	YES	1.11	\$31,922
26	694	0.21	13	65.8	30.9	NEW BRIGHTON	2910 TORCHWOOD DR.	BERNE CIR E	W. OF FOREST DALE RD	S	\$35,563	YES	1.06	\$33,645
27	169	0.56	30	66.5	26.9	MINNETONKA	9608 ROBIN OAK RD.	FORD PARK	CEDAR LAKE RD	W	\$40,605	YES	1.11	\$36,511
28	13	0.28	14	67.3	25.4	BURNSVILLE	11430 GALTIER DR	MID KEATING AVE	GALTIER DR	S	\$43,048	YES	1.17	\$36,704
29	149	0.17	10	66.5	28.7	EAGAN	3280 DODD RD	CHAPEL LN	ADVANTAGE LN	N	\$40,904	YES	1.11	\$36,865
30	62	0.23	14	66.0	30.8	EDINA	6645 MCCAULEY TR. W.	TIMBER TRAIL	W. OF GLEASON AVE	S	\$41,757	YES	1.07	\$38,961
31	169	0.16	9	65.3	28.7	ST.LOUIS PK.	1440 JORDAN AVE S	S. OF I-394	FORD PARK	W	\$41,434	YES	1.02	\$40,581
32	7	0.06	3	75.8	24.8	SHOREWOOD	435 ELM PLACE	LINDEN ST SOUTH END	LINDEN ST NORTH END	S	\$51,037	NO	2.11	\$24,142
33	35W	0.13	7	73.3	27.5	LAKEVILLE	16962 KENRICK RD	S OF CO RD 46	N OF 170TH ST W	E	\$44,819	NO	1.77	\$25,299
34	55	0.16	7	75.3	21.9	MEDINA	620 HWY 55	W OF CLYDESDALE TRL	EAST OF CO RD 116	N	\$51,969	NO	2.04	\$25,450
35	52	0.37	14	76.0	18.8	COATES	15640 CLAYTON AVE. E.	N. OF 160TH ST E	END OF CLAYTON AVE	E	\$60,623	NO	2.14	\$28,282
36	494	0.29	11	75.2	18.9	SO. ST. PAUL	935 9TH AVE. SO.	7TH AVE S	BRENT AVE	N	\$58,686	NO	2.02	\$29,040
37	35E	0.38	15	74.2	19.8	EAGAN	3857 KINGSWOOD CT.	PALOMINO TRAIL	KINGS WOOD CT	E	\$57,024	NO	1.89	\$30,242
38	35E	0.30	10	76.3	16.8	EAGAN	2045 SAFARI HEIGHTS TRL	S OF SAFARI HEIGHTS TRAIL	N OF SAFARI HEIGHTS TRAIL	S	\$66,330	NO	2.19	\$30,307
39	169	0.42	22	70.2	25.9	MAPLE GROVE	6694 LANCASTER LN.	LANCASTER LN.	N OF 63RD	W	\$43,693	NO	1.43	\$30,541
40	94	0.11	6	72.0	28.3	ST PAUL	1621 SAINT ANTHONY AVE	SNELLING AVE N	FRY ST	N	\$49,834	NO	1.62	\$30,676
41	694	0.30	15	70.5	25.1	MAPLEWOOD	1695 CO RD D E	KENNARD ST	VIKING TRAIL E	S	\$45,143	NO	1.46	\$30,834
42	35E	0.47	21	71.3	22.5	EAGAN	1514 LAKEVIEW CURVE	BLACKHAWK RIDGE PT	BLACKHAWK LK DR	W	\$48,048	NO	1.55	\$31,047
43	35E	0.53	23	70.8	21.7	EAGAN	8965 HUNTERS WAY	CO RD 11	INPLACE WALL	S	\$49,635	NO	1.50	\$33,112
44	36	0.42	20	69.1	23.9	ROSEVILLE	423 MINNESOTA AVE	WESTERN AVE N	DALE ST N	N	\$44,096	NO	1.32	\$33,303
45	61	0.94	43	69.4	23.0	ST PAUL	738 PT. DOUGLAS RD. S	LOWER AFTON DR E	HIGHWOOD AVE	E	\$46,474	NO	1.36	\$34,257
46	61	0.13	7	68.5	25.9	NEWPORT	1796 HASTINGS AVE	N OF HIGH ST	PED BRIDGE (19TH ST)	E	\$43,827	NO	1.27	\$34,386
47	36	0.16	6	73.5	18.6	ROSEVILLE	1386 COLONIAL DR.	GOLF COURSE	HAMLIN AVE N	S	\$62,054	NO	1.80	\$34,427
48	10	0.25	10	71.8	20.1	MOUNDS VIEW	2300 LAPORT DR	EDGEWOOD DR	JACKSON DR	S	\$55,207	NO	1.60	\$34,459
49	7	0.27	13	69.4	23.7	MINNETONKA	16809 HWY 7	EAST OF CARLYSLE PL	EAST OF CLEAR SPRINGS RD	S	\$48,329	NO	1.36	\$35,625
50	65	0.07	4	70.5	26.9	FRIDLEY	1100 ONONDAGA WAY NE	ONONDAGA ST	FIRESIDE DR NE	E	\$52,252	NO	1.46	\$35,689
51	694	0.63	24	71.9	19.1	MAPLEWOOD	2340 CO. RD. D. E	MCKNIGHT RD N	E. OF BELLAIRE AVE N	S	\$57,667	NO	1.61	\$35,745
52	94	0.11	6	70.7	26.4	MAPLE GROVE	13985 81ST AVE. NO.	81ST AVE N	80TH AVE N	W	\$53,296	NO	1.48	\$36,026
53	61	0.44	16	72.3	18.3	ST.PAUL	1204 PT. DOUGLAS RD. S	OGDEN AVE	CARVER AVE	E	\$59,590	NO	1.65	\$36,052
54	62	0.40	15	71.9	18.7	RICHFIELD	6215 12TH AVE. SO.	11TH AVE S	W. OF BLOOMINGTON AVE S	S	\$58,315	NO	1.62	\$36,063
55	694	0.64	29	68.8	22.5	FRIDLEY	5407 E. BRENNER PASS	MATTERHORN DR NE	27TH AVE NW	S	\$47,664	NO	1.30	\$36,626
56	100	0.36	15	70.8	20.6	EDINA	4818 GOLF TERRACE	WINDSOR AVE	SOUTH VIEW LN	E	\$54,886	NO	1.49	\$36,717
57	62	0.54	17	74.0	15.8	MINNEAPOLIS	6040 15TH AVE	W OF LOREN DR	E. OF 15TH AVE S	N	\$68,826	NO	1.87	\$36,883
58	35W	0.52	19	72.2	18.3	NEW BRIGHTON	548 1ST AVE. NW	CO RD E2	S. OF 10TH ST NW	W	\$60,958	NO	1.65	\$37,008
59	35W	0.88	25	75.3	14.2	ARDEN HILLS	620 CLEVELAND AVE NW	GLEN PAUL AVE	R/R BRIDGE	E	\$76,075	NO	2.04	\$37,254
60	55	0.46	18	70.8	19.4	GOLDEN VALLEY	7001 OLSON MEMORIAL HWY	GLENWOOD AVE	DOUGLAS DR N	S	\$56,045	NO	1.49	\$37,492
61	47	0.59	28	67.5	23.9	MINNEAPOLIS	4603 UNIVERSITY AVE NE	44TH AVE NE	49TH AVE NE	E	\$45,018	NO	1.19	\$37,855
62	7	0.20	7	73.0	17.2	EXCELSIOR	836 PLEASANT ST.	PLEASANT ST.	S. OF GRANT ST	N	\$66,152	NO	1.74	\$37,995
63	10	0.24	10	69.7	21.1	ANOKA	929 NORTH ST.	W OF 9TH AVE	E OF 11TH AVE	N	\$52,744	NO	1.38	\$38,211
64	7	0.12	6	67.3	25.7	HOPKINS	1301 HWY 7	ROBINWOOD LN	ELMO SERVICE RD	N	\$44,836	NO	1.17	\$38,229
65	52	0.32	9	75.3	14.2	COATES	15777 CLAYTON AVE. E.	CLAYTON AVE	N. OF 160TH ST E	W	\$78,577	NO	2.04	\$38,480
66	35W	0.31	13	69.8	21.2	CIRCLE PINES	61 WILLOW POND TRL	SUNSET RD	WILLOW POND TRAIL	S	\$54,054	NO	1.39	\$38,890
67	94	0.46	17	71.3	18.4	ST. PAUL	445 ST. ANTHONY AVE.	KENT ST	WESTERN AVE N	N	\$60,843	NO	1.55	\$39,316

2016 Ranking	TH	Mile Res.	Res. No.	L10 Avg.	Density 1/4 Mi.Res.	City	Address	Priority Study Start	Priority Study End	Loc	Cost/Res.	Cost Effective	Intensity Adjustment Score	Intensity Adjusted Cost/Res.
68	65	0.18	9	67.5	25.3	FRIDLEY	6370 HWY 65 NE	MISSISSIPPI ST NE	S OF 64TH AVE NE	W	\$46,896	NO	1.19	\$39,434
69	94	0.31	15	67.7	23.8	ST.PAUL	942940 PACIFIC ST.	MOUND ST/INPLACE WALL	EARL ST	S	\$47,486	NO	1.20	\$39,472
70	100	0.23	12	66.5	26.1	BROOKLYN CENTER	5542 LILAC DR N	ERICON DR N	N OF HILLSVIEW	E	\$44,058	NO	1.11	\$39,708
71	35E	0.13	6	69.6	23.1	EAGAN	1562 MURPHY PKWY - SOUTH SEGMENT	N OF MURPHY PKWY	BLACKHAWK PARK	W	\$54,912	NO	1.38	\$39,920
72	51	0.41	17	69.5	20.5	ROSEVILLE	3112 SNELLING DR	LYDIA AVE W	GLENHILL	W	\$54,611	NO	1.37	\$39,977
73	52	0.39	10	76.0	12.9	COATES	16200 COATES BLVD.	N OF BRANDEL DR	S. OF 160TH ST E	E	\$86,139	NO	2.14	\$40,185
74	62	0.21	9	69.8	21.1	EDINA	6333 HALIFAX AVE S	VALLEY VIEW RD	FRANCE AVE S	N	\$56,377	NO	1.39	\$40,421
75	55	0.18	7	71.5	19.4	PLYMOUTH	1640 OAKVIEW LN. N.	NW OF 18TH AVE N	18TH AVE N	N	\$63,527	NO	1.57	\$40,485
76	36	0.46	21	67.3	22.8	ROSEVILLE	655 COPE AVE W	VICTORIA RD N	750 FT W OF VICTORIA RD N	N	\$47,523	NO	1.17	\$40,661
77	77	0.37	18	66.5	24.0	RICHFIELD	6841 CEDAR AVE. SO.	S OF E 67TH ST	E 70TH ST	W	\$45,175	NO	1.11	\$40,714
78	35E	0.46	17	69.8	18.6	MENDOTA HGTS.	1945 VICTORIA RD.	LEXINGTON AVE S	VICTORIA RD	W	\$56,862	NO	1.39	\$40,769
79	35E	0.29	15	67.8	25.6	BURNSVILLE	2105 GREAT OAKS DRIVE	ALONG GREAT OAKS DRIVE	EAST OF CO RD 11	N	\$49,580	NO	1.21	\$40,834
80	62	0.51	19	70.0	18.7	EDINA	6337 ST. JOHN'S AVE. S	RYAN AVE	ROSE CT	N	\$57,887	NO	1.41	\$40,932
81	52	0.22	10	68.6	22.4	SOUTH ST PAUL	1566 WATERLOO AVE	THOMPSON AVE	WENTWORTH AVE	W	\$52,410	NO	1.28	\$40,977
82	13	0.41	20	66.0	24.6	JORDAN	15123 CATES LAKE DR	152ND ST SW	150TH ST SE	S	\$44,096	NO	1.07	\$41,143
83	94	0.45	21	66.8	23.3	MAPLE GROVE	9107 UPLAND LN N	91ST AVE N	93RD AVE N	E	\$46,486	NO	1.13	\$41,176
84	169	0.63	22	70.8	17.4	PLYMOUTH	2505 KILMER LN.	S. OF 17TH AVE N	MEDICINE LK RD	W	\$62,127	NO	1.50	\$41,446
85	100	0.18	8	68.8	22.4	EDINA	6225 RYAN AVE.	62ND STREET	VALLEY VIEW ROAD	E	\$53,896	NO	1.30	\$41,559
86	69A	0.23	8	72.5	17.2	MAPLEWOOD	2175 CO RD D E	E OF ARIEL ST	MCKNIGHT	S	\$70,005	NO	1.68	\$41,625
87	55	0.42	14	71.5	16.7	EAGAN	3255 MINNESOTA 55	E OF DODD RD	W OF POND	W	\$65,537	NO	1.57	\$41,765
88	77	0.32	12	70.3	19.0	BLOOMINGTON	8330 OLD CEDAR AVE. SO.	E 82ND ST	S. OF E 84TH ST	W	\$60,607	NO	1.44	\$42,120
89	10	0.14	6	68.5	21.4	ANOKA	559 NORTH ST.	N 5TH AVE	CR 7	N	\$53,804	NO	1.27	\$42,214
90	77	0.13	6	66.1	23.1	APPLE VALLEY	12831 GLEN CT	N OF GLEN CT	S OF GLEN CT	W	\$45,740	NO	1.08	\$42,382
91	13	0.21	11	65.9	25.7	PRIOR LAKE	6757 RUSTIC RD SE	RUSTIC RD SE	OAKLAND BEACH AVE SE	W	\$45,125	NO	1.06	\$42,396
92	55	0.28	13	66.3	23.2	PLYMOUTH	14735 31ST AVE. NO.	NIAGARA LN N	JUNEAU LN N	N	\$47,263	NO	1.09	\$43,191
93	36	0.39	14	69.9	18.0	LITTLE CANADA	505 VIKING DR. E.	MCMENEMY ST (CR 140)	EDGERTON ST	N	\$60,781	NO	1.40	\$43,277
94	69A	0.35	10	73.3	14.4	WHITE BEAR LAKE	3100 MANITOU DRIVE	BELLAIRE AVE	GLEN OAKS AVE	N	\$77,323	NO	1.78	\$43,497
95	10	0.75	24	71.3	15.9	ARDEN HILLS	4471 LAKESHORE PLACE	COUNTY ROAD 96	SOUTH OF WEDGEWOOD CR	W	\$67,673	NO	1.55	\$43,729
96	65	0.25	12	67.3	23.6	FRIDLEY	6670 LUCIA LN.	68TH AVE NE	MISSISSIPPI ST NE	W	\$51,180	NO	1.17	\$43,789
97	36	0.42	18	67.9	21.4	MAPLEWOOD	770 VIKING DR. E.	SEARLE ST	E END OF VIKING DR E	S	\$53,834	NO	1.22	\$44,031
98	100	0.16	6	70.0	18.5	EDINA	6620 NORMANDALE RD.	W 66TH ST	NOB HILL DR	W	\$62,421	NO	1.41	\$44,138
99	35W	0.08	4	69.0	24.1	MINNEAPOLIS	926 S 13TH AVE	9TH ST S	11TH AVE S	N	\$58,434	NO	1.32	\$44,285
100	35E	0.19	10	66.2	25.9	EAGAN	1482 FEDERAL CT	VIOLET LN	BLACKHAWK LAKE DR	W	\$47,980	NO	1.08	\$44,304
101	47	0.23	10	67.0	21.8	FRIDLEY	6740 4TH ST NE	66TH AVE NE	RICE CREEK TERRACE NE	E	\$51,026	NO	1.15	\$44,421
102	77	0.64	24	69.0	18.7	APPLE VALLEY	13520 CEDAR AVE S	138TH ST W	MCANDREWS RD	E	\$58,776	NO	1.32	\$44,544
103	62	0.49	16	70.8	16.4	MINNEAPOLIS	6145 THOMAS AVE S	WASHBURN AVE S	PENN AVE S	N	\$66,537	NO	1.49	\$44,614
104	35E	0.34	12	69.8	17.6	LINO LAKES	6604 OTTER LAKE RD	TART LK RD	LACASSE DR	E	\$62,442	NO	1.39	\$44,769
105	62	0.54	18	70.5	16.6	RICHFIELD	5736 40TH AVE S	43RD AVE S	34TH AVE S	N	\$65,573	NO	1.46	\$44,788
106	55	0.35	12	70.3	17.0	GOLDEN VALLEY	6820 OLSON MEMORIAL HWY	KELLY DR N	JERSEY AVE N	N	\$64,916	NO	1.44	\$45,114
107	12	0.45	18	68.2	19.9	WAYZATA	339 GARDNER ST.	BARRY AVE N	BROADWAY AVE N	S	\$56,164	NO	1.24	\$45,148
108	94	0.13	6	69.5	22.8	OAKDALE	8090 HUDSON BLVD N	IDEAL AVE N	IMMANUEL AVE N	N	\$61,801	NO	1.37	\$45,241
109	7	0.26	10	68.4	19.2	EXCELSIOR	725 2ND AVE	EAST OF MILL ST	DIVISION ST	S	\$57,900	NO	1.27	\$45,638
110	55	0.19	8	68.5	20.7	PLYMOUTH	18335 HIGHWAY 55	W OF URBANDEALE CT N	URBANDEALE CT N	S	\$58,395	NO	1.27	\$45,816
111	36	0.45	20	65.8	22.4	ROSEVILLE	1225 SHERREN ST W	W OF DELLWOOD ST	LEXINGTON AVE N	S	\$48,333	NO	1.05	\$45,885
112	69A	0.13	6	67.8	22.7	ST. PAUL	4647 HAMLET AVE	47TH ST	46TH ST	W	\$55,767	NO	1.21	\$45,929
113	62	0.28	12	66.3	21.7	EDINA	5120 ROBERTS PL	WYMAN AVE	E. OF WILRYAN AVE	N	\$50,692	NO	1.09	\$46,324
114	7	0.64	26	66.9	20.3	GREENWOOD	21030 EXCELSIOR BLVD	CHRISTMAS LK RD	ST. ALBANS CIR	N	\$53,041	NO	1.14	\$46,604
115	10	0.21	10	66.1	23.3	COON RAPIDS	2637 CARLSON DR.	121ST LN NW	S END OF CARLSON DR NW	S	\$50,316	NO	1.08	\$46,687
116	52	0.30	10	70.0	16.6	INVER GROVE HTS.	7288 BANCROFT WAY	ALONG BANCROFT WAY	S. OF 70TH ST E	W	\$67,079	NO	1.41	\$47,432
117	35E	0.29	9	70.8	15.6	EAGAN	1733 BRANT CIRCLE	BRANT CIRCLE	S. OF DIFLEY RD	S	\$71,446	NO	1.49	\$47,795
118	49A	0.48	11	75.0	11.6	RICHFIELD	734 78TH ST. E.	12TH AVE S	PORTLAND AVE S	N	\$95,769	NO	2.00	\$47,884
119	55	0.10	4	68.5	19.4	PLYMOUTH	12417 HWY 55	15TH AVE N	LARCH LN N	S	\$62,155	NO	1.27	\$48,766
120	35E	0.16	6	69.6	18.8	EAGAN	1562 MURPHY PKWY - NORTH SEGMENT	N OF MURPHY PKWY	BLACKHAWK PARK	W	\$67,584	NO	1.38	\$49,133
121	169	0.14	4	75.5	13.8	BROOKLYN PK	7328 HWY 169 N.	73RD AVE N	N OF 74TH AVE N	E	\$101,762	NO	2.07	\$49,148
122	52	0.44	19	65.5	21.8	INVER GROVE HTS.	2140 49TH WAY E.	UPPER 45TH ST E	49TH WAY E	W	\$51,172	NO	1.04	\$49,315
123	10	0.23	9	66.9	19.9	ANOKA	2511 WINGFIELD DR	STATE ST	N FERRY ST	S	\$56,312	NO	1.14	\$49,364
124	12	0.69	20	70.6	14.5	WAYZATA	316 RIDGEVIEW DR	EAST OF FERNDAL RD N	BROADWAY AVE N	N	\$72,730	NO	1.47	\$49,504
125	35E	0.16	6	69.6	18.5	EAGAN	1562 MURPHY PKWY	N OF MURPHY PKWY	BLACKHAWK PARK	W	\$68,317	NO	1.38	\$49,665
126	62	0.33	14	65.7	21.0	EDINA	6307 DORON LN.	E. OF TRACY AVE	R/R TRACKS	S	\$52,200	NO	1.05	\$49,900
127	62	0.23	6	71.8	13.1	RICHFIELD	3126 58TH ST E	34TH AVE S	31ST AVE S	N	\$80,639	NO	1.60	\$50,332
128	65	0.23	8	69.5	17.5	BLAINE	1372 95TH LN. NE.	97TH AVE NE	95TH AVE NE	W	\$69,064	NO	1.37	\$50,558
129	55	0.26	6	73.3	11.7	PLYMOUTH	1010 EVERGREEN LN.	GOLDENROD LN N	MEDICINE LAKE DR W	N	\$90,579	NO	1.78	\$50,953
130	52	0.21	7	69.2	16.6	INVER GROVE HTS.	6460 BECKMAN DR.	63RD ST E	BECKMAN AVE	W	\$68,498	NO	1.33	\$51,375
131	61	0.59	22	66.6	18.5	ST.PAUL	1604 PT. DOUGLAS RD. S	S. OF CARVER AVE	NW OF I-494	E	\$58,423	NO	1.12	\$52,169
132	36	0.27	7	72.3	13.0	NO ST PAUL	2055 HWY 36 E	E OF COTTAGE CIRCLE	ARIEL ST N	N	\$87,347	NO	1.66	\$52,662
133	62	0.20	6	70.3	15.0	MINNEAPOLIS	5736 S. 46TH AVE.	S 46TH AVE	S 43RD AVE	N	\$77,020	NO	1.44	\$53,341
134	49A	0.29	8	71.3	13.6	SO ST PAUL	1890 52ND ST E	INPLACE WALL	W OF BABCOCK TRL	S	\$62,648	NO	1.54	\$53,590

2016 Ranking	TH	Mile Res.	Res. No.	L10 Avg.	Density 1/4 Mi.Res.	City	Address	Priority Study Start	Priority Study End	Loc	Cost/Res.	Cost Effective	Intensity Adjustment Score	Intensity Adjusted Cost/Res.
135	36	0.24	8	69.0	17.0	ROSEVILLE	741 SHERREN ST. W.	VICTORIA ST N	SCHOOL	S	\$70,938	NO	1.32	\$53,761
136	100	0.17	7	66.0	21.1	EDINA	5004 60TH ST. W.	BENTON AVE	VALLEY VIEW RD	W	\$58,512	NO	1.07	\$54,594
137	36	0.64	22	67.4	17.1	N ST. PAUL	2060 CASTLE AVE. E.	E OF SHERREN AVE	COMMERCIAL	S	\$64,834	NO	1.18	\$54,898
138	10	0.13	4	69.5	15.9	ANOKA	2507 MAPLE AVE.	N FERRY ST	RIVER	E	\$75,705	NO	1.37	\$55,419
139	169	0.28	7	72.0	12.6	SHAKOPEE	12325 JOHNSON MEMORIAL DR	S OF TH 169	MOBILE MANOR	S	\$90,138	NO	1.62	\$55,486
140	62	0.10	4	68.7	19.7	EDINA	6332 BROOKVIEW AVE.	VALLEY VIEW RD	BROOKVIEW AVE S	N	\$71,626	NO	1.29	\$55,615
141	100	0.22	7	68.8	15.7	EDINA	4828 VALLEY VIEW RD	60TH ST W	BENTON AVE	E	\$72,285	NO	1.30	\$55,739
142	52	0.48	15	68.2	15.6	W ST. PAUL	460 ANNAPOLIS ST E	PAGE ST E	ANNAPOLIS ST E	W	\$70,243	NO	1.24	\$56,465
143	494	0.10	4	68.3	19.8	SO ST PAUL	936 6TH AVE S	5TH AVE S	7TH AVE S	N	\$71,158	NO	1.26	\$56,609
144	13	0.22	7	68.3	15.7	BURNSVILLE	11432 VALLEY CT	115TH ST E	GALTIER DR	N	\$72,502	NO	1.26	\$57,678
145	62	0.42	13	68.0	15.4	RICHFIELD	6205 SHERIDAN AVE S	WASHBURN AVE S	E. OF RUSSELL AVE S	S	\$71,157	NO	1.23	\$57,797
146	100	0.23	8	66.4	17.6	EDINA	4836 SUNNYSLOPE RD. W.	W 50TH ST	CREEK BRIDGE	E	\$63,944	NO	1.10	\$58,030
147	35	0.81	27	66.5	16.7	STACY	201 RIVERVIEW RD	STACY TRL N	FIR TRL	W	\$64,552	NO	1.11	\$58,043
148	65	0.10	3	70.0	15.4	BLAINE	1390 108TH AVE NE	S OF 108TH AVE NE	N OF 108TH AVE NE	W	\$82,305	NO	1.41	\$58,198
149	77	0.47	16	66.2	17.2	EAGAN	4388 CINNAMON RIDGE TRAIL	CINNAMON RIDGE TRAIL	CLIFF RD	W	\$63,488	NO	1.08	\$58,624
150	94	0.12	4	68.5	16.1	MINNEAPOLIS	1803 13TH AVE S	11TH AVE S	14TH AVE S	S	\$74,881	NO	1.27	\$58,750
151	62	0.29	8	69.5	14.0	RICHFIELD	5801 44TH AVE S	42ND AVE S	46TH AVE S	S	\$80,587	NO	1.37	\$58,993
152	494	0.10	3	70.5	14.6	SO ST PAUL	1022 6TH AVE S	7TH AVE S	5TH AVE S	S	\$86,932	NO	1.46	\$59,376
153	694	0.19	7	67.0	18.0	FRIDLEY	5455 4TH ST NE	4TH ST NE	7TH ST NE	S	\$68,375	NO	1.15	\$59,387
154	35E	0.73	22	67.3	15.1	MENDOTA HGTS.	1614 DIANE RD.	MARIE AVE W	TH 13	W	\$70,124	NO	1.17	\$59,791
155	36	0.54	19	65.4	17.6	LITTLE CANADA	368 HWY 36 E	MCMEINEMY ST	SUNRISE DR	S	\$61,743	NO	1.03	\$60,055
156	35E	0.13	6	65.5	22.6	EAGAN	1638 MURPHY PKWY	N OF MURPHY PKWY	BLACKHAWK PARK	N	\$62,181	NO	1.04	\$60,063
157	7	0.50	14	68.7	14.1	SHOREWOOD	19101 DELTON AVE.	VINE HILL RD	SPARROW RD	S	\$77,801	NO	1.29	\$60,201
158	47	0.18	6	66.8	16.8	FRIDLEY	298 67TH AVE. NE.	67TH AVE NE	RICE CREEK TERRACE	W	\$68,458	NO	1.13	\$60,428
159	51	0.38	12	66.8	16.0	ROSEVILLE	1488 GLENHILL DR.	LYDIA AVE W	GLENHILL	W	\$69,048	NO	1.13	\$60,949
160	62	0.10	3	69.3	15.4	EDINA	6320 WEST SHORE RD.	RYAN AVE	W SHORE DR	S	\$82,210	NO	1.35	\$61,021
161	77	0.77	22	68.0	14.2	RICHFIELD	E 72ND ST. & CEDAR AVE SO.	S OF DIAGONAL BLVD	S. OF E 76TH ST	W	\$75,900	NO	1.23	\$61,650
162	65	0.11	3	70.8	13.7	SPRING LAKE PK.	1110 80TH AVE. NE.	80TH AVE NE	81ST AVE NE	E	\$92,166	NO	1.49	\$61,656
163	62	0.75	22	67.5	14.7	RICHFIELD	2231 58TH ST E	28TH AVE S	CEDAR AVE	N	\$73,547	NO	1.19	\$61,846
164	65	0.23	7	68.5	15.3	FRIDLEY	6379 HIGHWAY 65 NE	63RD AVE NE	MISSISSIPPI ST NE	E	\$80,721	NO	1.27	\$63,333
165	7	0.29	9	66.6	15.8	ST. LOUIS PK.	3701 QUEBEC AVE S.	TEXAS AVE S	OREGON AVE S	S	\$70,894	NO	1.11	\$63,672
166	62	0.13	6	69.8	23.6	EDINA	6233 DARCY LN.	R/R TRACKS	WYMAN AVE	N	\$89,368	NO	1.39	\$64,075
167	36	0.13	4	67.8	15.5	ROSEVILLE	590 HIGHWAY 36 SERVICE RD W	DALE ST N	APT COMPLEX	S	\$78,080	NO	1.21	\$64,306
168	35E	0.47	14	67.5	14.8	BURNSVILLE	12645 TIFFANY CT.	GARNET CT	E BURNSVILLE PARKWAY	N	\$76,808	NO	1.19	\$64,588
169	55	0.39	9	71.0	11.4	INVER GROVE HTS.	9467 COURTHOUSE BLVD	CONCORD BLVD	96TH ST E	W	\$98,136	NO	1.52	\$64,745
170	62	0.36	11	66.4	15.2	EDINA	6300 MCINTYRE PT	INPLACE WALL	MCINTYRE PT	S	\$72,887	NO	1.10	\$65,994
171	55	0.46	12	68.5	13.0	PLYMOUTH	12230 STATE HWY 55	LARCH LN N	GOLDENROD LN N	N	\$84,984	NO	1.27	\$66,677
172	94	0.27	6	71.3	11.2	MAPLE GROVE	8147 MAPLE LN N	WEAVER LAKE RD	W OF 81ST AVE N	N	\$103,226	NO	1.55	\$66,702
173	94	0.19	6	67.8	15.6	MINNEAPOLIS	1805 S. 14TH AVE.	14TH AVE S	16TH AVE S	S	\$81,194	NO	1.21	\$66,870
174	77	0.25	8	66.8	15.9	APPLE VALLEY	13586 GOSSAMER WAY	ALONG GOSSAMER WAY	N. OF 138TH ST W	W	\$75,871	NO	1.13	\$66,971
175	100	0.48	15	66.0	15.7	EDINA	5004 YVONNE TER.	RICHMOND DR	VALLEY VIEW RD	W	\$71,974	NO	1.07	\$67,154
176	65	0.45	13	66.5	14.5	BLAINE	8822 CENTRAL AVE. NE.	89TH AVE NE	85TH AVE NE	W	\$75,485	NO	1.11	\$68,031
177	13	0.23	6	67.5	13.0	BURNSVILLE	2301 HORIZON RD.	HIGHLAND VIEW AVE S	CLIFF RD	E	\$81,153	NO	1.19	\$68,241
178	55	0.27	7	68.3	13.0	PLYMOUTH	9141 HWY 55	ALONG OFF RAMP FROM TH 169	DECATUR AVE N	S	\$87,309	NO	1.26	\$69,458
179	169	0.35	10	66.2	14.5	PLYMOUTH	3000 KILMER LN.	30TH AVE N	27TH AVE N	W	\$76,874	NO	1.09	\$70,837
180	61	0.32	8	68.7	12.3	COTTAGE GROVE	11667 PT DOUGLAS DR. S.	S. OF LEADER AVE	EXIT OFF OF TH61	W	\$91,492	NO	1.29	\$71,041
181	10	0.46	12	67.3	13.0	ELK RIVER	9135 COLLINS DR NW	W OF BEATY AVE NW	EAST OF BEATY AVE NW	S	\$84,454	NO	1.17	\$72,008
182	35E	0.11	4	66.3	17.7	BURNSVILLE	2904 GLACIER CT	POND	BRYCE CT	N	\$79,478	NO	1.09	\$72,629
183	77	0.38	10	66.4	13.2	EAGAN	12097 GANTRY CT	BRIAR OAKS PARK	ROYAL CT	E	\$80,234	NO	1.10	\$72,814
184	62	0.29	9	66.5	15.4	EDINA	6300 ROLF AVE.	WYMAN AVE	WILRYAN AVE	S	\$82,423	NO	1.11	\$74,284
185	36	0.48	13	67.4	13.5	ROSEVILLE	925 W HWY 36	VICTORIA ST N	LEXINGTON AVE N	N	\$88,286	NO	1.18	\$74,885
186	62	0.55	12	69.8	11.0	EDINA	6308 CHOWEN AVE. S.	W. OF EWING AVE S	XERXES AVE S	N	\$104,971	NO	1.39	\$75,262
187	52	0.15	2	75.5	6.7	INVER GROVE HTS.	11097 E. COURTHOUSE BLVD.	N OF 111 ST E.	S. OF PINE BEND MOTEL	W	\$158,561	NO	2.07	\$76,580
188	5	0.22	6	65.9	13.8	EDEN PRAIRIE	7748 CARNELIAN LN	HERITAGE RD	CARNELIAN LN	N	\$83,275	NO	1.06	\$78,238
189	55	0.37	8	68.0	10.9	PLYMOUTH	18220 HWY 55	SE OF OLD ROCKFORD RD	W OF PEONY LN N	N	\$96,832	NO	1.23	\$78,652
190	35W	0.30	7	70.5	11.7	NEW BRIGHTON	3670 CLEVELAND AVE N	R/R TRACKS	CR-E2	E	\$115,342	NO	1.46	\$78,781
191	35E	0.87	21	67.0	12.1	WHITE BEAR TWP	6238 OTTER LAKE RD.	ASH ST (CR 81)	64TH ST	E	\$91,872	NO	1.15	\$79,979
192	35E	0.08	3	69.8	18.8	EAGAN	4465 CLOVER LN	S OF BERM	N OF BERM	E	\$112,396	NO	1.39	\$80,585
193	55	0.38	9	66.3	11.8	PLYMOUTH	12325 HWY. 55	E OF LARCH LN N	GOLDENROD LN N	S	\$89,217	NO	1.09	\$81,529
194	52	0.09	2	71.0	11.3	INVER GROVE HTS.	2228 67TH ST. E.	67TH ST E	68TH ST E	W	\$124,364	NO	1.52	\$82,050
195	47	0.36	7	66.8	9.9	MINNEAPOLIS	4925 UNIVERSITY AVE NE	49TH AVE NE	50TH AVE	E	\$107,181	NO	1.30	\$82,362
196	7	0.29	7	68.7	12.2	MINNETONKA	18200 OLD EXCELSIOR BLVD.	SPARROW RD	LYNWOOD TERRACE	N	\$92,860	NO	1.12	\$82,824
197	52	0.22	3	76.0	6.9	INVER GROVE HTS.	9190 COURTHOUSE BLVD CT.	NW OF COURTHOUSE BLVD CT	NW OF CONCORD BLVD	W	\$182,731	NO	2.14	\$85,247
198	494	0.08	2	69.0	12.4	RICHFIELD	1324 E 78TH ST	14TH AVE S	12TH AVE S	N	\$113,598	NO	1.32	\$86,092
199	12	0.45	8	69.6	8.8	WAYZATA	16603 HOLDRIDGE RD	HOLDRIDGE RD W	CROSBY RD	S	\$119,879	NO	1.37	\$87,453
200	47	0.11	3	69.5	13.2	FRIDLEY	6890 UNIVERSITY AVE NE	RICE CREEK BLVD	W SERVICE DRIVE	W	\$119,654	NO	1.37	\$87,592
201	36	0.31	6	69.0	9.8	ROSEVILLE	1830 W HWY 36	E OF HERSCHEL ST	W OF SNELLING AVE N	S	\$117,672	NO	1.32	\$89,178

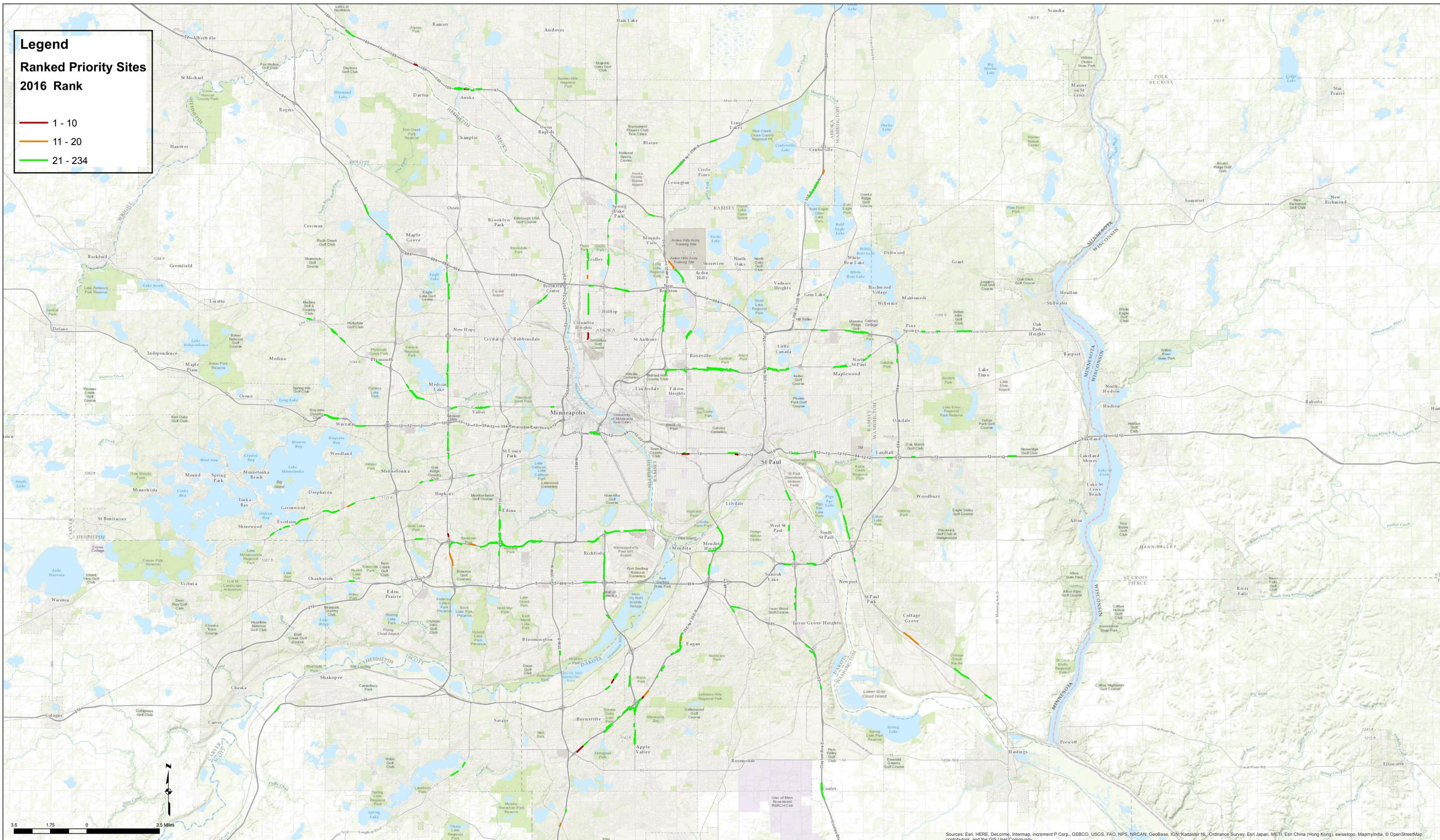
2016 Ranking	TH	Mile Res.	Res. No.	L10 Avg.	Density ¼ Mi.Res.	City	Address	Priority Study Start	Priority Study End	Loc	Cost/Res.	Cost Effective	Intensity Adjustment Score	Intensity Adjusted Cost/Res.
202	10	0.21	5	66.3	12.0	ANOKA	2511 WINGFIELD AVE	FERRY ST	GOLF COURSE	N	\$97,872	NO	1.09	\$89,439
203	36	0.11	3	66.0	13.1	MAPLEWOOD	801 VIKING DR E	VIKING DR	ARCADE	N	\$96,852	NO	1.07	\$90,366
204	36	0.15	3	69.5	10.1	LAKE ELMO	9302 60TH ST N	.2 MILES E OF JASMINE AVE N	JASMINE AVE N	N	\$125,752	NO	1.37	\$92,056
205	694	0.37	24	68.5	32.8	OAKDALE	5424 HELENA RD. NO.	50TH ST N	HEATH AVE N	E	\$117,897	NO	1.27	\$92,500
206	62	0.32	7	66.8	10.8	MINNETONKA	6145 CHASEWOOD PKWY	W OF CLARION PASS	ROWLAND RD	N	\$105,582	NO	1.13	\$93,198
207	55	0.29	6	67.5	10.4	PLYMOUTH	17605 41ST AVE N	W OF 141ST AVE N	141ST AVE N	N	\$111,022	NO	1.19	\$93,358
208	35E	0.43	10	65.2	11.6	MENDOTA HGTS.	1830 EAGLE RIDGE RD.	VICTORIA RD S	MARIE AVE W	W	\$96,117	NO	1.02	\$94,630
209	100	0.15	3	68.5	10.0	EDINA	6116 RYAN AVE	63RD ST W	62ND ST W	E	\$126,720	NO	1.27	\$99,422
210	94	0.37	4	74.8	5.4	LAKE ELMO	12818 HUDSON BLVD N	NEAL AVE N	MIDWEST AVE N	N	\$196,887	NO	1.97	\$99,818
211	10	0.14	3	67.5	10.6	ANOKA	2409 MAPLE LN	FERRY ST	RIVER	S	\$119,366	NO	1.19	\$100,374
212	36	0.68	14	65.6	10.3	ROSEVILLE	1907 GLUEK LANE N	ENT. RAMP TO TH 36	FAIRVIEW AVE N	S	\$106,002	NO	1.04	\$101,508
213	77	0.51	10	66.5	9.8	APPLE VALLEY	404 CIMARRON RD	CIMARRON RD	CHAPARRAL CT	W	\$113,095	NO	1.11	\$101,927
214	61	0.80	10	72.1	6.2	COTTAGE GROVE	10478 E PT DOUGLAS RD. S	N. OF KIMBERLY CT S	S OF KIMBRO AVE S	E	\$169,975	NO	1.63	\$104,270
215	7	0.16	3	68.5	9.3	MINNETONKA	4530 HIGHLAND RD	WOF HIGHLAND RD	HIGHLAND RD	S	\$136,582	NO	1.27	\$107,160
216	61	0.21	5	65.2	12.2	ST. PAUL	273 BIRMINGHAM ST.	BURNS AVE	PACIFIC ST	E	\$108,579	NO	1.01	\$107,455
217	55	0.13	2	68.5	7.7	MINNEAPOLIS	1315 6TH AVE N	IRVING AVE N	EAST OF HUMBOLT AVE N	S	\$137,155	NO	1.27	\$107,609
218	169	0.07	2	68.8	15.0	ST LOUIS PARK	2849 JORDAN AVE S	28TH ST W	RAMP	E	\$141,127	NO	1.30	\$108,447
219	35W	0.79	13	67.9	8.2	BLAINE	3601 CENTERWOOD RD	CENTERWOOD RD	WAKE CT NE	E	\$133,453	NO	1.22	\$109,151
220	61	0.07	1	69.3	7.2	WHITE BEAR LAKE	3908 HOFFMAN RD.	CEDAR AVE	CO. RD F E.	W	\$147,109	NO	1.35	\$109,194
221	35E	0.49	6	72.5	6.1	ST PAUL	2330 LEXINGTON AVE S	S OF WAGON WHEEL TRL	N OF MENDOTA HEIGHTS RD	W	\$187,674	NO	1.68	\$111,592
222	62	0.14	3	65.3	11.0	EDINA	6325 RYAN AVE	RYAN AVE	INPLACE WALL	N	\$115,002	NO	1.02	\$112,635
223	100	0.24	4	66.8	8.2	BROOKLYN CENTER	5830 LOGAN AVE N	W OF LILAC DR N	INPLACE WALL	E	\$128,246	NO	1.13	\$113,203
224	35E	0.24	3	73.0	6.2	BURNSVILLE	700 EVERGREEN DRIVE	PORTLAND AVE	W OF ASTON	S	\$203,030	NO	1.74	\$116,610
225	36	0.15	3	65.5	9.7	NO ST PAUL	2606 13TH AVE E	CHARLES ST N	MARGARET ST N	N	\$130,160	NO	1.04	\$125,726
226	77	0.19	3	68.5	7.8	BLOOMINGTON	1945 MEADOWVIEW RD.	E OLD SHAKOPEE RD	MEADOWVIEW RD	W	\$161,492	NO	1.27	\$126,704
227	36	0.67	9	68.8	6.7	STILLWATER	10510 60TH ST N	.26 MILES W OF LAKE ELMO AVE N	W OF 60TH ST LN N	N	\$167,085	NO	1.30	\$128,395
228	36	0.14	2	66.5	7.3	LAKE ELMO	6029 INWOOD CT N.	E OF INWOOD CT	W OF INWOOD CT	N	\$144,497	NO	1.11	\$130,228
229	94	0.28	5	65.8	8.9	OAKDALE	6692 ASHWOOD RD	ASHWOOD RD	WIER DR	S	\$147,917	NO	1.06	\$139,938
230	7	0.12	2	67.0	8.6	MINNETONKA	3963 COTTAGE LN.	SHADY OAK RD	COTTAGE LN	N	\$163,784	NO	1.15	\$142,583
231	35W	0.16	2	71.0	6.2	BLOOMINGTON	10501 BLOOMINGON FRWY	W 106TH ST	CEMETERY	E	\$225,365	NO	1.52	\$148,685
232	169	0.51	4	72.0	3.9	PLYMOUTH	3640 LANCASTER LN N	S. OF PILGRIM LN N	36TH AVE N	W	\$270,803	NO	1.62	\$166,699
233	494	0.06	1	69.5	8.3	RICHFIELD	7740 2ND AVE. SO.	4TH AVE S	W OF 4TH AVE S	N	\$253,979	NO	1.37	\$185,924
234	35	0.19	2	65.5	5.2	FOREST LAKE	21699 EUREKA AVE N.	SOUTH OF 217YH STREET	NORTH OF 217TH STREET	E	\$268,493	NO	1.04	\$259,348
235	7	0.40	3	65.4	3.7	ST. LOUIS PK.	7850 37TH ST. W.	TEXAS AVE S	WALKER ST	N	\$284,192	NO	1.03	\$276,420

Appendix

NOISE ABATEMENT STUDY FIGURE

Legend
Ranked Priority Sites
2016 Rank

- 1 - 10
- 11 - 20
- 21 - 234



0 1.75 3.5 Miles

Source: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Appendix

**LIST OF REVIEW
COMMITTEE MEMBERS**

MnDOT Noise Policy Update Review Committee	Agency
Steve Lillehaug	Brooklyn Center
Chad Millner	Edina
Jim Gates	Bloomington
Doran Cote	Plymouth
John Maczko	St. Paul
Jean Keely	Blaine
Michael Thompson	Maplewood
marc Culver	Roseville
Todd Blomstrom	Apple Valley
Chris Petree	Lakeville
Russ Matthys	Eagan
Ryan Peterson	Burnsville
Scott Thureen	Inver Grove Heights
Tom Kaldunski	Inver Grove Heights
John Mazzitello	Mendota Heights
Brian Bachmeier	Oakdale
Jennifer Levitt	Cottage Grove
Peter Wasko	MnDOT
Jon Solberg	MnDOT
Tom O'Keefe	MnDOT
Marilyn Jordahl-Larson	MnDOT
Phillip Bergem	MnDOT
Thomas Styrbicki	MnDOT
John Crawford	MnDOT