TRAFFIC NOISE ANALYSIS

Project I.D. 1053-02-04
WIS 29
Wausau – Wittenberg
Sunrise Drive – Business 51
Marathon County

Prepared for:
Wisconsin Department of Transportation – North Central Region
1681 Second Avenue South
Wisconsin Rapids, WI 54495

January 2013

Prepared by
KL Engineering, Inc.

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1.0 Project and Traffic Noise Analysis Overview

The Wisconsin Department of Transportation (WisDOT) is in the process of developing plans for a proposed project located on WIS 29 between Sunrise Drive and Business 51 in Marathon County. The project location is presented in Attachment 1.

WisDOT is proposing the following improvements:

- Replace approximately 1,000 feet of the existing pavement of eastbound and westbound WIS 29 from just west of the Wisconsin River to just east of Business 51 (replace signs, pavement marking, and culverts as warranted).
- Improve the eastbound and westbound WIS 29 bridges over the Wisconsin River and Business 51. This work includes deck replacement and widening the westbound WIS 29 bridges over the Wisconsin River and Business 51 and the eastbound WIS 29 bridge over Business 51. The eastbound WIS 29 structure over the Wisconsin River will have its deck replaced.
- Improve the Sunrise Drive overpass structure of WIS 29, including deck repairs, placement of a concrete overlay on the deck, and parapet replacements. The bridge will also be raised on the north end to provide clearance for oversized overweight vehicles.

U.S. noise regulation (23 CFR 772) requires state highway agencies to determine noise impacts and evaluate possible mitigation measures as part of a proposed Type I Federal Aid project. Due to the proposed widening of the WIS 29 bridges, the project is considered a Type 1 project. Therefore, a Traffic Noise Analysis was conducted for the proposed project to approximate noise levels at properties near the roadway due to vehicle traffic on WIS 29 under current and projected conditions. The noise levels were developed using traffic data for WIS 29 supplied by the Wisconsin Department of Transportation's (WisDOT) Traffic Forecast Report, presented in Attachment 2.

2.0 Traffic Noise Analysis

Aerial photos and a visit to the study area were used to select noise receptors. Results of noise modeling and noise receptor locations are identified on the Results of Noise Modeling figure in Attachment 3. The Federal Highway Administration (FHWA) Traffic Noise Model, V 2.5 (TNM®) was used to model existing (2010) and future (2036) noise levels at these locations. A Summary of the TNM® results is presented in Attachment 4.

The results of the traffic noise modeling and field readings taken on March 29 and December 3, 2012 indicate that noise levels at locations along the corridor equal or exceed the noise level criteria (NLC) of 67 decibels (dB). In accordance with WisDOT Facilities Development Manual (FDM) Procedure 25-35-1, when a noise impact occurs, a determination must be made if mitigation is feasible, reasonable, and likely to be incorporated into the project. Section 23-35 of the WisDOT FDM is presented in Attachment 5. For a noise abatement measure to be feasible, a minimum of one impacted receptor or common use area must achieve a 5 dB noise reduction.

Future conditions were modeled with the inclusion of a noise barrier between Sunrise Drive and the Wisconsin River, north of WIS 29. The barrier was modeled at approximately the northern right-of-way line along WIS 29. The location of the noise barrier is presented on the figures in Attachments 3 and 6.

In accordance with the WisDOT FDM Procedure 23-35-10, a minimum of one impacted receptor or common use area must achieve a 5 dB noise reduction for a noise abatement measure to considered feasible. In accordance with the WisDOT FDM Procedure 23-35-15, a noise barrier must achieve an 8 decibel (dB) reduction for a receptor to be considered a benefited receptor and the cost per benefited receptor must be equal to or less than $30,000 to be considered reasonable.

The barrier height needed to achieve the 8 dB required reduction for the front row receptors (8 dB, including a 9 dB reduction at one of those receptors) was estimated using TNM®. It was determined that a noise barrier approximately 20 feet high would be needed to achieve this reduction. Based on the estimated wall length (1,215’), wall height (20’), and cost per square foot ($18), this wall would cost approximately $437,400, or $43,740 per each of the 10 identified receptors along Paramount Drive. Because this amount exceeds $30,000, this barrier is not considered reasonable. The barrier would also likely need to be higher near its east end to achieve the necessary reduction at receptor 11 and other nearby receptors. A noise barrier was not modeled adjacent to receptor 17 (east of the Wisconsin River, north of WIS 29); while a barrier at this location would be feasible, it would not be reasonable based on the $30,000 per benefitted receptor criteria.

Based on the number of potentially benefitted receptors (10), the length of the wall (1,215’) and the estimated cost of a sound barrier ($18/sq. ft.), the maximum height of a cost-reasonable barrier would be approximately 13.7 feet. Therefore, a 13.5’ barrier was modeled. This barrier did not achieve the required 8 dB reduction at the receptors in the area, which indicates that a barrier in this location would not be reasonable.

The Detailed View of Modeled Barrier Area figure in Attachment 6 provides a closer view of the noise barrier area and identifies receptors (residences) that were figured into barrier feasibility, as well as an explanation of the rationale for modeling a barrier with a maximum barrier height of 13.5 feet.

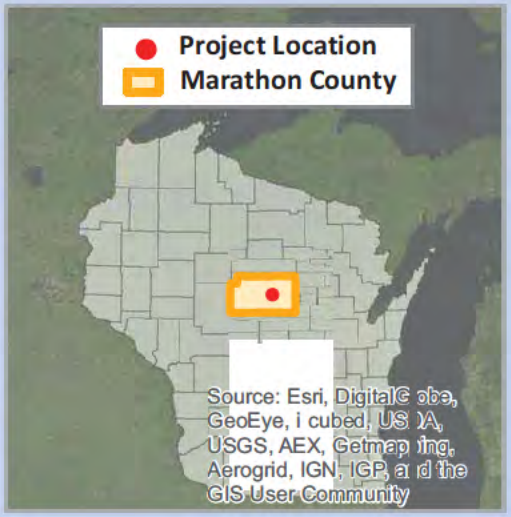
Based on the findings of the Traffic Noise Analysis, a traffic noise barrier for the project would not be considered reasonable based on criteria set forth in WisDOT FDM Chapter 23.

Attachment 1

Project Location Map

Project Location

WisDOT ID: 1053-02-04
WIS 29
Wausau Wittenberg
Sunrise Drive Business 51
Marathon County



Attachment 2

WisDOT Traffic Forecast Report

TRAFFIC FORECAST REPORT

PROJECT ID(S): 1053-02-04 - WisDOT Forecast
ROUTE(S): STH 29

REGION/COUNTY(IES): NC / Marathon
LOCATION: I-39/US 51 to CTH X
COMPLETED: October 16, 2012

Developed by: Chris Chritton
Phone: (608) 266 0194
FAX #: (608) 267 0294
E Mail ID:chris.chritton@dot.wi.gov

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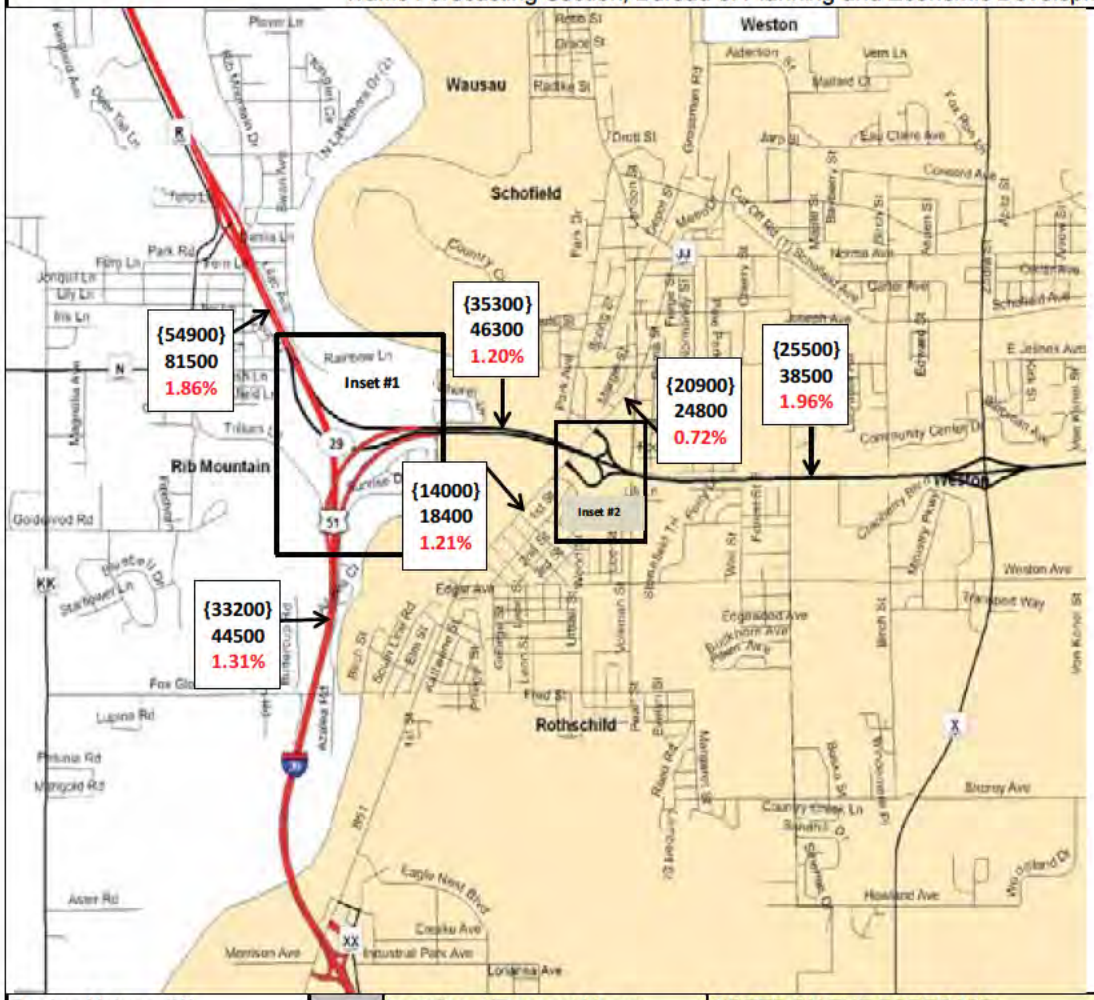
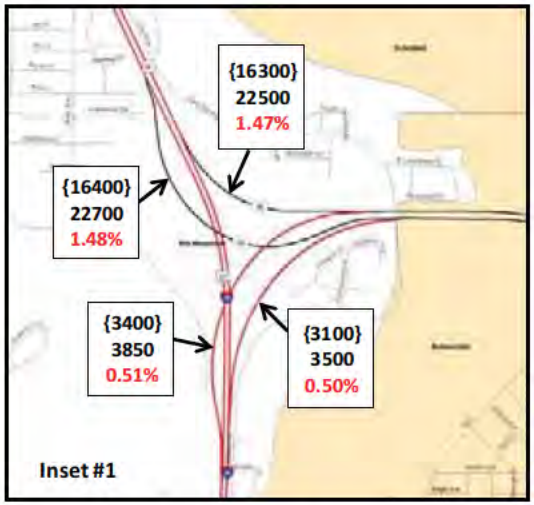
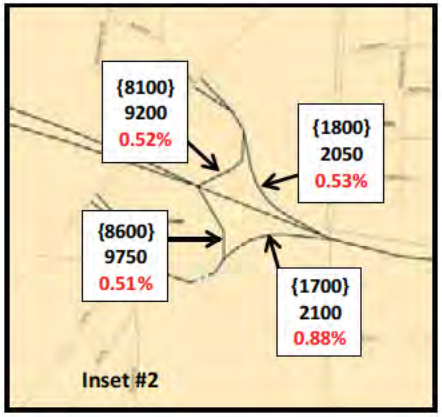
Traffic Forecasting Section; Bureau of Planning and Economic Development; Division of Transportation Investment Management







Design Values (%)			
Routes →	STH 29		
Design Volume(s):	46300		
K250	8.7	--	--
K100	9.4	--	--
K30	9.9	--	--
T(DHV)	15.7	--	--
D(Dsgn. Hr.)	59/41	--	--
K8(ADT)	--	--	--
T(A8HV)	--	--	--

Last Count/Forecast Years:

{000} 2010 AADT
(000) 2016 AADT
-000- 2026 AADT
000 2036 AADT
0.00% 2010-2036 AGR

Truck Class %'s			
Class	Seg. 1	Seg. 2	Seg. 3
2D	5.2	--	--
3AX	5.6	--	--
2S1+2S2	2.4	--	--
3-S2	4.1	--	--
DBL BTM	1.0	--	--
TOTAL	####	--	--

NOTES ON THE FORECAST:

1. This projection assumes that no major new traffic generators will be developed in the area served by the roadway or intersection over the course of the planning period.

2. The historical traffic count trends will continue increasing at a decreasing rate. BoxCox regression is used to project past count data.

3. Truck classification percentages were determined from a apecial classification count performed at Site # 371135 (STH 29 between BUS USH 51 and CTH X from 10/8/2012 to 10/10/2012.

MORE NOTES ON THE FORECAST:

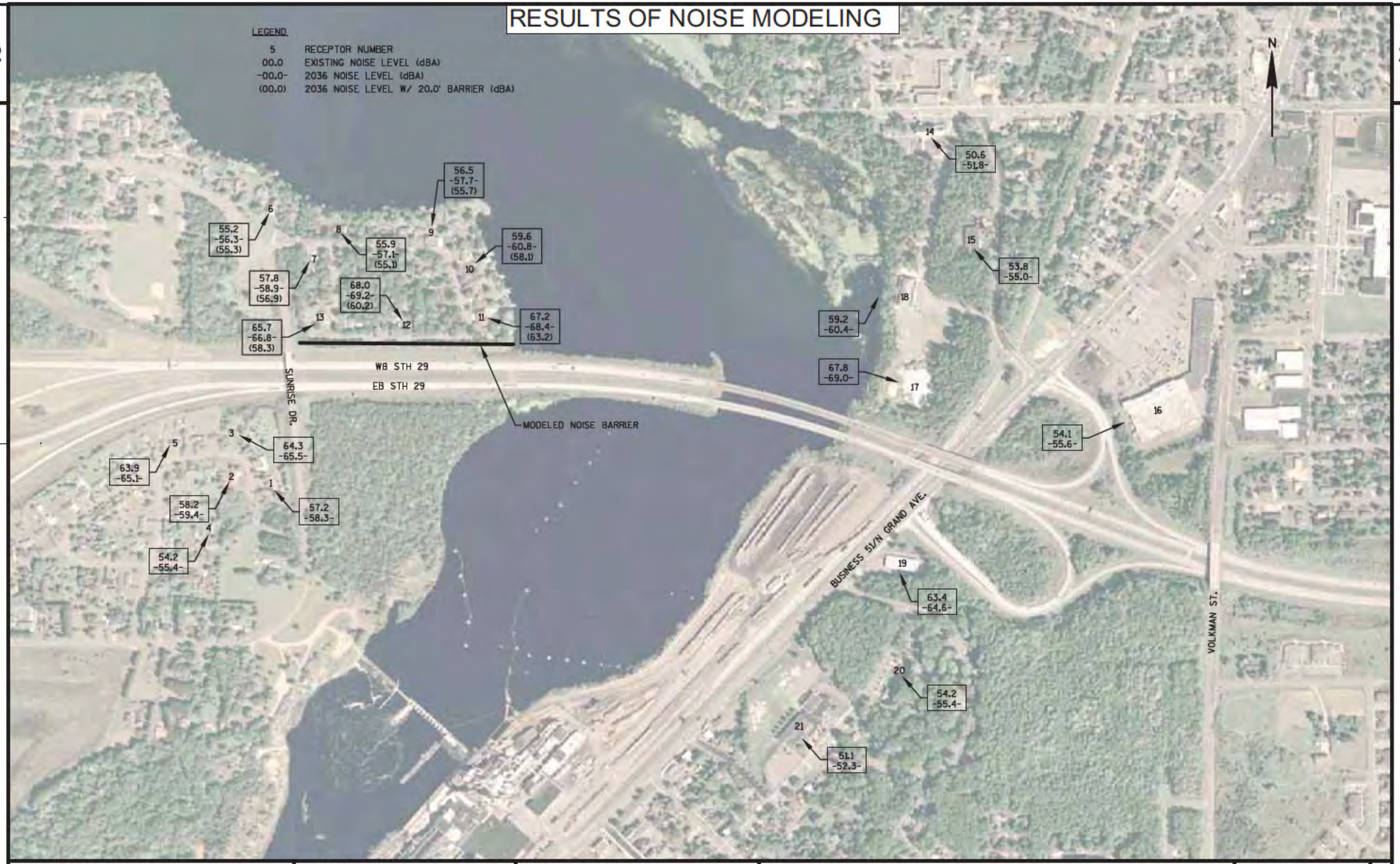
4. STH 29 is a factor group II (urban other) highway (indicating low to moderate fluctuation in traffic from a seasonal perspective). It is functionally classified as a urban principal arterial (14) for count purposes.

5. The Marathon County Travel Demand Model was consulted and used as a comparison tool to check against the Traffic Analysis Forecasting Information System output. Adjustments were made as needed.

Attachment 3

Results of Noise Modeling

RESULTS OF NOISE MODELING



PROJECT NO:1053-02-04	HWY: STH 29	COUNTY: MARATHON	PLAN: NOISE ANALYSIS	SHEET	E

FILE NAME : G:\AYRES\12015 STH 29 WAUSAU\NOISE\AYRES PROVIDED FILES\NOISE.DWG PLOT DATE : 12/11/2012 PLOT BY : KL ENGINEERING PLOT NAME : ---------- PLOT SCALE : 1:500 WISDOT/CADDS SHEET 42

Attachment 4

Summary of Traffic Noise Model Results

Wisconsin Department of Transportation

I.D. 1053-02-04 & 1053-05-30
Wausau - Wittenberg
Sunrise Drive - Business 51
WIS 29
Marathon County

SUMMARY of TRAFFIC NOISE MODEL RESULTS

Receptor I.D.	A Existing Noise Levels (dB) 2010 Traffic	B Future Noise Levels (dB) 2036 Traffic	C Noise Level Increase in Future (dB) = Col. B - Col. A	D Future Noise Levels with 20' Barrier (dB) 2036 Traffic	E Noise Reduction with 20' Barrier (dB) = Col. B - Col. D	F Future Noise Levels with 13.5' Barrier (dB) 2036 Traffic	G Noise Reduction with 13.5' Barrier (dB) = Col. B - Col. E
1	57.2	58.3	1.1	58.3	0.0	58.3	0.0
2	58.2	59.4	1.2	59.4	0.0	59.4	0.0
3	64.3	65.5	1.2	65.5	0.0	65.5	0.0
4	54.2	55.4	1.2	55.4	0.0	55.4	0.0
5	63.9	65.1	1.2	65.1	0.0	65.1	0.0
6	55.2	56.3	1.1	55.3	1.0	55.5	0.8
7	57.8	58.9	1.1	56.9	2.0	57.6	1.3
8	55.9	57.1	1.2	55.1	2.0	55.8	1.3
9	56.5	57.7	1.2	55.7	2.0	56.7	1.0
10	59.6	60.8	1.2	58.1	2.7	59.2	1.6
11	67.2	68.4	1.2	63.2	5.2	65.3	3.1
12	68.0	69.2	1.2	60.2	9.0	63.4	5.8
13	65.7	66.8	1.1	58.3	8.5	60.5	6.3
14	50.6	51.8	1.2	51.7	0.1	51.7	0.1
15	53.8	55.0	1.2	55.0	0.0	55.0	0.0
16	54.1	55.6	1.5	55.6	0.0	55.6	0.0
17	67.8	69.0	1.2	69.0	0.0	69.0	0.0
18	59.2	60.4	1.2	60.4	0.0	60.4	0.0
19	63.4	64.6	1.2	64.6	0.0	64.6	0.0
20	54.2	55.4	1.2	55.4	0.0	55.4	0.0
21	51.1	52.3	1.2	52.3	0.0	52.3	0.0

Traffic Noise Model analysis conducted November 2012 through January 2013 using Federal Highway Administration (FHWA) Traffic Noise Model, version 2.5 (TNM®)

Attachment 5

WisDOT FDM Section 23-35

FDM 23-35-1 Introduction

July 28, 2011

23 CFR 772.13(h) states, "The FHWA will not approve project plans and specifications unless feasible and reasonable noise abatement measures are incorporated into the plans and specifications to reduce the noise impact on existing activities, developed lands, or undeveloped lands for which development is permitted."

When a noise impact occurs per FDM 23-30, a determination must be made if mitigation is feasible per FDM 23-35-10, reasonable per FDM 23-35-15 and likely to be incorporated into the project per FDM 23-35-20.The methodologies and process for determining these three factors are applied uniformly for all projects throughout the state.

The results of this determination must be included as part of the environmental document.

FDM 23-35-5 Mitigation Measures

July 28, 2011

Traffic noise mitigation measures commonly employed are described below. There is a hierarchy to the discussion of abatement. A discussion of traffic control measures should be presented first, then buffer zones, then barriers and finally sound-proofing.

5.1 Traffic Control Measures

Traffic control measures that could be employed in certain instances include prohibition of certain vehicle types (usually trucks) from a particular route or restricting vehicles (again, presumably trucks) from operating during noise sensitive times of the day. The prohibition of trucks from a major roadway can produce up to an 8 to 10 dB reduction in noise, at times providing an adequate traffic management abatement measure. This noise mitigation measure is typically incompatible with the purpose and need of a project. If this noise mitigation measure has been determined feasible and reasonable, the department's State Noise Engineer should be contacted prior to incorporation of the measure into the project commitments.

Lowering the speed limit is not to be considered as a traffic control measure to reduce noise levels. Roadways are designed to accommodate user expectations and a posted speed limit set lower than the limit for which the road was designed results in users traveling at a variety of speeds causing a potential safety problem.

5.2 Buffer Zones

Acquisition of real property or interests therein (predominately unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise may be included as part of a Type I project only.

5.3 Nose Barriers

There is only a certain amount of attenuation to be realistically gained through design and traffic control modifications. Once these are met, the next logical step is to evaluate a barrier specifically for the purpose of attenuating noise.

Noise barriers can constructed in the form of earth berms or walls made of concrete, bricks, blocks, rock gabions, wood, metal, fiberglass or composites. Berm/wall combinations are also used.

Costs will vary depending on type of material, labor costs, footings required, etc. Barriers can be aesthetically unpleasing, attract vandalism, and create drainage and maintenance problems. They can, however, be pleasing to the eye, have low maintenance, and minimal other problems, given ideal circumstances.

Theoretically, barriers can reduce noise levels by 20-23 dB. However, noise level reductions of 8-12 dB are more typical. Noise barriers made of walls are discussed further in FDM 23-35-6 and FDM 23-35-7.

5.4 Soundproofing

Assuming that all possible design measures have been taken to minimize noise levels, there are still other means by which the effects of sound can be mitigated. A method of reducing interior sound levels is to soundproof buildings. Only Land Use Category D properties indentified in FDM 23-30 Table 2.1, Noise Level Criteria (NLC) For Considering Barriers (see FDM 23-30) are eligible for consideration of soundproofing as a noise mitigation measure.

The Federal Highway Administration (FHWA) permits federal funds to be used for this purpose on land uses indentified in Land Use Category D.

Land Use Category D is only used as the basis for noise impact determination in situations where no exterior activities are to be affected by the traffic noise, or where the exterior activities are far from or physically shielded from the roadway in a manner that prevents an impact on exterior activities. An indoor sound level analysis for Land Use Category D properties is only conducted after exhausting all outdoor analysis options. An indoor analysis for the purpose of considering soundproofing as a mitigation measures is only conducted after a determination has been made that exterior measures will not be reasonable and feasible.

The easiest method of accomplishing noise mitigation through soundproofing is to install air conditioning, which has two benefits. First, windows can be kept shut in warm weather to reduce noise from exterior sources. Second, when coupled with other measures to improve energy efficiency, it can eliminate gaps or openings that allow noise to enter interior spaces. When possible, using double-paned windows and reducing window area can also be effective.

If interior analysis and the possible use of soundproofing as a noise mitigation measure are being considered, the department's State Noise Engineer should be contacted prior to analysis.

FDM 23-35-6 Noise Walls

July 28, 2011

Noise walls are one method used to mitigate traffic generated noise impacts. Noise walls should be considered if other abatement measures are not found to be feasible or reasonable.

All noise wall systems must be prequalified by WisDOT prior to being used on WisDOT projects. All systems must be designed in accordance with the current edition of "Guide Specifications for Structural Design of Sound Barriers" published by the American Association of State Highway and Transportation Officials (AASHTO), 444 North Capitol Street, NW, Suite 225, Washington, DC 20001 in addition to the requirements of the appropriate special provision inserted into the contract. The noise wall system to be constructed must be listed on the WisDOT Prequalified Noise Wall System List. Prior to the first public information meeting for a noise wall project, the designer should reference the department's most current Prequalified Noise Wall System List (http://www.dot.wisconsin.gov/business/engrserv/approvedprod.htm).

The project plans will provide a conceptual design that identifies the noise wall system location including; beginning and ending points, horizontal alignment, and top and bottom of wall system elevation lines. Noise wall surface type shall be included in the special provisions, as applicable, per FDM 23-35-7. Standardized Special Provisions have been prepared which incorporate all necessary specifications. The appropriate Standardized Special Provision must be used in the Plans, Specifications, and Estimates.

Within 25 days after the award of the contract, the contractor shall provide the Region project engineer with the name of the noise wall system to be constructed. The noise wall system selected by the contractor must be a system that was prequalified prior to the contract letting date.

The contractor shall provide the Region project engineer with three (3) copies of the design calculations, design drawings, certifications and other information as specified by the Standard Specifications, Special Provision, and plans.

The contactor shall also submit the following documents to the Bureau of Structures Design Section; three (3) sets of design/shop drawings and one (1) set of design calculations for review and acceptance. Any necessary revisions and/or corrections required for acceptance will be noted and returned to the contractor to be revised and resubmitted for review and acceptance.

FDM 23-35-7 Noise Wall Surface Type Selection

July 28, 2011

7.1 Purpose

This procedure provides guidance for the selection of noise wall surface type. This policy applies to all noise wall installations, including noise walls constructed as part of a Type I project or a WisDOT Retrofit Project.

7.2 Background

Noise barriers fall into one of two categories, those with absorptive surfaces and those with non-absorptive surfaces.

The principles of acoustics indicate that sound reflected from the surface of a noise wall has the potential of increasing sound levels at existing noise sensitive receptors located on the opposite side of the roadway from the proposed noise wall project. Specifying an absorptive noise wall will reduce reflected sound levels by eighty

percent or more, thereby reducing reflected sound to below the level noticeable to the healthy human ear.

If noise abatement is found to be reasonable and feasible and is proposed for installation, the designer shall specify a noise wall surface type based on the criteria below.

For purposes of these criteria, an **ABSORPTIVE NOISE WALL SURFACE** is defined as a noise wall system having a composite **Noise Reduction Coefficient (NRC)** of at least 0.80 on the roadway side of the noise wall and 0.70 on the residential side, as applicable. The composite NRC shall be calculated using the actual NRC value of each member of the total system as determined from ASTM C423 / E795 test data.

7.3 Criteria for Selection of Noise Wall Surface Type

An absorptive noise wall surface shall be specified for use on any of the following noise wall installations:

1. ROADWAY SIDE OF PARALLEL NOISE WALLS, when installed initially as a pair, or separately as part of an approved, multi-year noise abatement plan;
2. ROADWAY SIDE OF A SINGLE-SIDE-OF-ROADWAY NOISE WALL, when residential or other noise-sensitive receptors are located opposite from the roadway wall face; and,
3. RESIDENTIAL SIDE OF THE NOISE WALL, when residential or other noise-sensitive receptors may be affected by reflected noise from other sources located on the residential side of the noise wall.

If reflected noise has the potential to impact lands which are currently undeveloped, the designer shall consider proposed land uses for the undeveloped lands when selecting the noise wall surface type.

Single sided, double sided and reflective noise wall surface types shall be specified for all other noise wall installations.

Requests for exceptions to this policy shall be submitted to the department's State Noise Engineer.

7.4 Special Provision

The following Standardized Special Provisions (STSP's) should be used when specifying noise walls for a project.

STSP #	Title	Bid Item #
531-005	Noise Barriers, Single Sided Sound Absorptive	90585
531-010	Noise Barriers, Double Sided Sound Absorptive	90586
531-015	Noise Barriers, Reflective	90587

FDM 23-35-10 Noise Abatement Feasibility *July 28, 2011*

The project manager is responsible for the feasibility decision of noise abatement through the use of traffic control measures and the acquisition of buffer strips. The feasibility decision should be based on whether or not the measures proposed are compatible with the project purpose and need, meet design criteria and guidance or result in other impacts that would offset noise reduction benefits.

Other factors that must be considered for based on the various noise abatement measures being evaluated include; safety, barrier height, topography, drainage, utilities, and maintenance of the abatement measure, maintenance access to adjacent properties, and access to adjacent properties.

For a noise abatement measure to be feasible, a minimum of one (1) impacted receptor or common use area shall achieve a 5 decibel noise reduction.

Barrier design is conducted using the latest version of the FHWA Traffic Noise Model (TNM). TNM barriers are either walls or berms that intervene between roadways and receivers to reduce sound levels. For purposes of barrier design, TNM allows you to perturb barrier heights up and down to optimize the barriers effectiveness. TNM allows berm/wall combinations and barriers on structure to be input. You may designate whether the barrier is absorptive or reflective.

When an analysis is completed and an impact determination is made for Land Use Category D properties, a feasibility determination of noise abatement through soundproofing for those properties is handled on a case-by-case basis. Many factors influence the feasibility of the various types of possible soundproofing mitigation measures. Some factors to include in determining whether or not a specific method of soundproofing is feasible include; age and orientation of the building, the presence and condition of heating, ventilation and air conditioning systems in the existing building. Owner's concerns and input may factor into both the feasibility and

reasonableness determination. The department's State Noise Engineer should be included in the feasibility determination.

FDM 23-35-15 Noise Abatement Reasonableness July 28, 2011

15.1 Traffic Control and Buffer Strips

The project manager is responsible for the reasonableness decision of noise abatement through the use of traffic control measures and the acquisition of buffer strips. The reasonableness decision should be based on whether or not the measures add substantial cost to the project when compared to the noise reduction benefit gained.

15.2 Noise Barriers

For noise barrier reasonableness determinations, the department's State Noise Engineer shall be consulted in making the determination.

For a noise barrier to be reasonable, the total cost may not exceed $30,000 per benefited receptor. The department may annually adjust this $30,000 maximum figure up or down based on the last three years of available noise barrier construction cost data. This review will take place on an annual basis.

To make a reasonableness determination, a noise barrier shall be designed (horizontal and vertical location) such that a minimum of one (1) receptor or common use area achieves the department's noise reduction design goal of 9 decibels.

A noise barrier shall reduce noise levels by a minimum of 8 decibels for a receptor or common use area to be considered as benefited for the purposes of determining reasonableness.

For purposes of reasonableness determination;

- Each individual residence benefited is counted as one (1) benefited receptor.
- Each dwelling unit benefited in a multi-family dwelling is counted as one (1) benefited receptor.
- Each dwelling unit in the multi-family complex eligible to use the benefited common use area is counted as one (1) benefited receptor.
- Each discrete parcel benefited in Land Use Categories A, C, D and E of FDM 23-30 Table 2.1, Noise Level Criteria (NLC) For Considering Barriers is counted as one (1) benefited receptor, except,
- Section 4(f) properties as identified in Land Use Category C of FDM 23-30 Table 2.1, Noise Level Criteria (NLC) For Considering Barriers will be evaluated on a case-by-case basis to determine the location of equivalent receptors on the discrete parcel that will each count as one (1) benefited receptor. This evaluation shall be made in consultation with the WisDOT Noise Engineer and FHWA staff.

Noise wall section heights and lengths shall be modeled with the most recent version of the FHWA Traffic Noise Model (TNM). These heights and lengths can be used to calculate the total area of the barrier in square feet (sq. ft.).

To determine the estimated cost of the noise wall, the total noise wall area is multiplied by $18.00/sq. ft.

If the noise wall is to be place on top of a berm, the cost of borrow, if required, should also be calculated using the latest borrow costs available.

It is the department's preference that real estate not be acquired for construction of a noise barrier. If it is determined that real estate will be acquired, the Region's Real Estate Section must be contacted for an estimate of the real estate purchase cost.

The total noise barrier cost is calculated by adding the estimate noise wall cost, berm cost and real estate cost.

The noise barrier cost per benefited receptor is calculated by dividing the total noise barrier cost by the total number of receptors benefited by construction of the noise barrier.

If the noise barrier cost per benefited receptor is equal to or less than $30,000, the noise barrier is considered reasonable and a determination of whether or not the barrier will be incorporated into the project is made.

If the noise barrier cost per benefited receptor is greater than $30,000, the noise barrier is considered not reasonable and the process ends with inclusion of this finding in the environmental document.

If a common noise environment exists within the project termini, cost averaging of multiple barriers within the common noise environment may occur as part of the reasonableness determination. A common noise environment is a group of receptors within the same Land Use Category listed in FDM 23-30 Table 2.1 (Noise

Level Criteria For Considering Barriers),that are exposed to similar noise sources and levels, traffic volumes, traffic mix, and speed, and topographic features. Generally, common noise environments occur between two secondary noise sources such as interchanges, intersections and cross-roads.

An individual barrier within a common noise environment may not be included in the cost averaging determination if the barrier cost exceeds $60,000 per benefited receptor.

The order of cost averaging of eligible multiple barriers within a common noise environment will be to first average the most cost-effective noise barrier with the second most cost effective barrier. If the average cost is below $30,000 per benefited receptor, then both noise barriers are considered cost effective. The process then continues with adding the next most cost-effective barrier and performing averaging again. This process continues until a barrier causes the cost average to exceed $30,000 per benefited receptor. All barriers up to, but not including that barrier and any other barriers not yet averaged in, may be carried forward for a determination of whether or not the barrier(s) will be incorporated into the project.

If a noise barrier is not feasible or reasonable, third party funding and Community Sensitive Solution (CSS) money may not be used on a Federal, Federal-aid or state-funded Type I project to make the noise barrier feasible or reasonable. Third party funding and CSS money is acceptable on a Federal, Federal-aid or state-funded Type I project to make functional enhancements such as access doors or aesthetic treatments (provided such enhancements and treatments are part of the preapproved noise barrier system), to a noise abatement measure already determined feasible and reasonable.

Third party funding is allowed on WisDOT Retrofit Projects if the noise abatement measure would require additional funding from the third party to be considered feasible and/or reasonable. CSS money is not allowed on WisDOT Retrofit Projects if the noise abatement measure would require additional CSS money to be considered feasible and/or reasonable. Third party funding and CSS money is acceptable on WisDOT Retrofit Projects to make functional enhancements such as access doors or aesthetic treatments (provided such enhancements and treatments are part of the preapproved noise barrier system), to a noise abatement measure already determined feasible and reasonable.

15.3 Soundproofing

For soundproofing to be reasonable, the total cost may not exceed $30,000 in 2011 dollars per benefited receptor. The department may annually adjust this $30,000 maximum figure up or down based on changes in the construction price index after 2011. A review of this amount will occur at least once every five years.

The cost of the noise abatement measures through soundproofing shall be based on the latest cost available for the soundproofing measure being proposed. Only the costs of design, materials and installation are eligible for Federal and State funding.

FDM 23-35-20 Likely To Be Incorporated Into The Project *July 28, 2011*

When a noise barrier has been determined feasible and reasonable, a determination of whether or not the abatement measure is likely to be incorporated into the project shall occur. The word “likely” is used because the final determination to construct noise abatement occurs in final design and approvals prior to construction. Changes could occur in final design that result in the need to revisit preliminary design decisions made related to noise impacts and abatement.

The determination of “likely to be incorporated” is done through at least one public information meeting and vote of the benefited receptors.

When soundproofing has been determined feasible and reasonable, the department shall work with the building owner to determine whether or not the abatement measure will be incorporated into the project.

20.1 Public Information Meeting

The department shall hold one or more public information meetings, in a location convenient to the locality to be affected by the proposed noise barrier, to provide an opportunity for local participation in the selection and development of the noise barrier installation project. The department shall arrange for published notice of each information meeting. The department shall also give direct written notice of each public information meeting to each person owning real property or leasing a residence in the following locations:

- Within 500 feet in any direction from the proposed noise barrier, or,
- Within the areas directly behind the proposed noise barrier and directly across the highway from the proposed noise barrier where the highest hourly traffic noise level approaches or exceeds the levels in FDM 23-30 Table 2.1, Noise Level Criteria For Considering Barriers.

Exhibits available at the public information meeting should include:

- A Handout Packet that typically it includes the following;
    - Cover sheet
    - Handout packet contents
    - Welcome
    - Project location map
    - Noise barrier(s) location map
    - Purpose of public information meeting including a brief project summary
    - Explanation of the noise barrier selection process
    - Future actions including project schedule
    - Construction time frame if it is determined that the noise barrier will be include in the project
    - WisDOT contact information
    - Comment sheet
- Aerials showing the location of the barrier(s) including;
    - Street names
    - Property addresses and lot lines
    - Before and after sound levels at receptors
    - Barrier section heights
- Conceptual renderings and photos showing the barrier(s) in relation to buildings.
- Pre-approved barrier product samples and brochures that show available barrier systems, colors and textures.
- Extra voting ballots for those owners and tenants of benefited receptors that want to submit a vote at the public information meeting.
- Applicable real estate brochures if real estate acquisition is required as part of the project.

20.5 Voting

For a proposed noise barrier project to be considered for construction, the department must receive a vote of support for the project from a simple majority of all votes cast by the owners or residents of the benefitted receptors as follows:

- For each benefited receptor that is an owner-occupied residence, the owner shall have one vote
- For each benefitted receptor that is not an owner-occupied residence, the owner shall have one vote and one resident shall have one vote

The ballot shall be sent to each eligible voter by registered mail, return receipt requested. A self-addressed, stamped envelope shall also be included with the ballot. The Region Office will determine who is responsible for collecting ballots.

The public meeting notice shall be included in the mailing transmitting the ballot. There should be an explanation included in the cover letter that the ballot can be submitted at the public information meeting or by using the self-addressed stamped envelope. A date for returning the ballot of no less than thirty (30) days after the public information meeting should also be included.

The noise barrier selection process needs to be clearly defined in the cover letter included with the ballot sent to the eligible voters. It is important for voters to understand that the selection of the barrier system to be constructed is the sole responsibility of the contractor awarded the project. Owner and resident input will likely be limited to barrier color and texture.

All reasonable effort should be made to ensure that each eligible voter returns a ballot indicating whether or not they support construction of the noise barrier. Such efforts could include phone calls and personal visits to those owners and tenants not returning a ballot by mail or at the public information meeting.

Documentation of the various methods used to gather votes should be included as part of the administrative record.

Documentation of the final vote tally and decision of whether or not to construct the noise barrier(s) should also be included as part of the administrative record.

Attachment 6

Detailed View of Modeled Barrier Area

Detailed View of Modeled Barrier Area
Project I.D. 1053-02-04
WIS 29
Wausau - Wittenberg
Sunrise Drive - Business 51
Marathon County

Barrier Reasonability Equation
10 receptors (1st row, front facing) (labeled 1 through 10)
Modeled barrier length = 1,215'
Maximum cost per receptor = $30,000
Maximum cost for barrier ($30,000 x 10 receptors) = $300,000
Cost of barrier per square foot = $18
Maximum allowable barrier height = $300,000 / (1,215' x $18) = 13.7'
Therefore, a 13.5' barrier was used in the model.

LEGEND

00.0	Existing Modeled Noise Level (dBA)
00.0	2036 Modeled Noise Level (dBA)
(00.0)	2036 Modeled Noise Level with 13.5' Noise Barrier (dBA)