



Ohio Department of Transportation

Statewide Investigation of Noise Abatement Alternatives Final Report



June 2006

Prepared By:

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In Association with:



BURGESS & NIPLE

OHIO DEPARTMENT OF TRANSPORTATION

*STATEWIDE INVESTIGATION OF
NOISE ABATEMENT ALTERNATIVES*

FINAL REPORT

Submitted to:

Ohio Department of Transportation
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DISCLAIMER STATEMENT

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Ohio Department of Transportation or the Federal Highway Administration. This report is intended to provide background information on potential noise mitigation measures available for implementation in the State of Ohio, and does not constitute a standard, specification or regulation.

EXECUTIVE SUMMARY

In the 126th Ohio General Assembly, the Ohio Legislature passed Amended Substitute House Bill 68 which took effect on July 1, 2005. Among many items in the legislation, it established in Section 203.03.18 a requirement for the Department of Transportation "...to perform a study of alternate soundproofing methods or techniques that could be used as an alternative to traditional sound barriers." The scope of this study is to investigate any and all potentially feasible and reasonable noise abatement alternatives available for use in Ohio, while maintaining compliance with current federal and state policy on noise abatement.

Federal transportation funds may be used for noise abatement measures where a traffic noise impact is identified; the proposed noise abatement measures would reduce the traffic noise impacts; and the overall noise abatement benefits are determined to outweigh the overall adverse social, economic, and environmental effects and costs of the noise abatement measure.

Current federal law allows for several noise abatement measures which may be incorporated into noise abatement projects to reduce anticipated traffic noise impacts. These measures include:

- Traffic management measures;
- Alteration of horizontal and vertical roadway alignments;
- Acquisition of property rights for construction of noise barriers;
- Construction of noise barriers (including landscaping for aesthetic purposes) whether within or outside the highway right of way;
- 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 noise; and,
- Noise insulation of public use or nonprofit institutional structures.

While the Federal Highway Administration (FHWA) supports the range of noise mitigation techniques identified above, in many cases feasible and reasonable noise mitigation on a specific project is often limited to the use of structural noise barriers, particularly when the project involves widening of an existing roadway. This choice is often a function of the balance between mitigation effectiveness, cost, ease of engineering implementation, and potential environmental impacts associated with structural noise barriers.

In addition to the noise mitigation measures specifically identified in federal law, this study expands on those options to include a complete analysis of all available noise mitigation techniques that may be available to the Department. Additional topics to be covered by this report include, but are not limited to:

- Consideration of natural barriers such as trees, shrubs, mounds, and similar elements;
- Alternate pavement types and surface treatments including “quiet pavements;”
- Noise cancellation technology;
- Noise masking; and,
- Noise-compatible land use planning.

Various tables in the report provide a summary of the noise mitigation measures that have been considered at the noise source, in the noise path, at the noise receiver, and through planning initiatives. These tables identify the specific mitigation measure considered, and present a summary of potential benefits, relative cost, maintenance concerns, pros, cons, and a summary of feasible situations for which the mitigation measure could be more effective.

Effective noise mitigation is also available by modifying the existing or proposed pavements, and replacing standard concrete pavement types with open graded and softer pavement options. Assuming concrete pavements as a standard, noise reduction of 3 to 8 decibels can be achieved by implementing alternate pavements and/or implementing roadway surface treatments and overlays. The report presents a summary of the options, benefits, and costs that can be anticipated.

Noise compatible land use planning is a very effective form of noise abatement since it can prevent non-compatible land uses from developing adjacent to roadways. However, it can only be regulated at the local government level and must be practiced consistently and proactively. Additionally, noise compatible land use planning cannot typically address existing noise impacts or situations where new roadways cannot avoid existing noise sensitive land uses.

This report concludes that there are several viable noise abatement and mitigation options available. However, based on the results of this study, noise barriers and earth berms have been determined to be the most common and most effective forms of noise abatement available to ODOT. The other methods mentioned in the report will continue to be explored and used as appropriate.

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