

# MDOT Highway Noise Analysis and Abatement Handbook

Special Notes *are in Italics*

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# Introduction

## I.1 Purpose of Handbook

This Handbook is in compliance with the Michigan State Transportation Commission's Policy on Noise Abatement (#10136) and supersedes the Michigan Department of Transportation's (MDOT) *Procedures and Rules for Implementation of State Transportation Commission Policy 10136 Noise Abatement*, dated July 31, 2003. This Handbook provides policy, procedures and guidance regarding highway traffic noise impact assessment, analysis, and reporting for Type I and Type II highway projects through the Early Preliminary Engineering Phase (EPE), where Environmental Clearance is done in accordance with the National Environmental Policy Act (NEPA) of 1969, and Preliminary Engineering (PE) Phase, where design is done.

Highway traffic noise impact analysis, abatement procedures, criteria, coordination requirements, and reporting guidance contained herein are based on the Federal Highway Administration's (FHWA) Title 23 Code of Federal Regulations, Part 772 (23 CFR 772), July 13, 2010 (see Appendix I). All transportation improvement projects developed in conformance with MDOT's guidelines shall be in conformance with those mandated by FHWA. This Handbook implements the requirements of 23 CFR 772 to Federal projects authorized under 23 USC throughout the State of Michigan.

## I.2 Organization of Handbook

MDOT's procedure for assessing and analyzing the noise impacts of Type I and Type II projects is outlined in the 7-Step process listed below.

- Step 1 – Initial Project Level Scoping and Determining the Appropriate Level of Noise Analysis
- Step 2 – Noise Analysis Initial Procedures
- Step 3 – Determining Highway Traffic Noise Impacts and Establishing Abatement Requirements
- Step 4 – Additional Considerations for Final Design Noise Barrier Analysis
- Step 5 – Construction Noise Consideration
- Step 6 – Public, Municipality, and Agency Involvement
- Step 7 – Reporting Results of Highway Traffic Noise Analysis

These steps are for organizational purposes only and are intended to illustrate the progression that is undertaken when conducting Type I and Type II projects through the project development stages for transportation improvement projects.

**NOTE** – *Applicable Early Preliminary Engineering and Preliminary Engineering Steps:*

Step 1 should occur when the Type I, Type II or Type III project is initially identified. The applicable sections of Step 2 through Step 7 should be addressed during both the Early Preliminary Engineering (EPE) Phase and the Preliminary Engineering (PE) Phase of a proposed transportation improvement project. Attention should be given to any changes that occurred in the project area between the time the environmental clearance document was approved and the completion of final design activities. When federal funds are associated with the project, coordination with FHWA should occur throughout the project's development.

### **I.3 Policy Statements**

MDOT follows all Federal laws, regulations, and guidance for highway noise abatement. The Michigan State Transportation Commission Policy (10136) (Appendix H) addresses MDOT's commitment. This Handbook details activity in Type I and Type II noise abatement to limit intrusion of highway noise into adjacent residential areas to reasonably achievable levels consistent with the U.S. Department of Transportation's Code of Federal Regulations (CFR), and taking into consideration MDOT's pavement life-cycle cost analysis and safety requirements, as well as other technical and financial implications. The Michigan State Transportation Commission supports four approaches to achieve this objective to alleviate traffic noise impacts summarized in the following:

- **Reduction of Noise at the Source** – Reduction of potential traffic noise by design to avoid areas of sensitive receivers, or through available treatment, if any, of the chosen road surface type are the most cost-effective noise controls available to MDOT.
- **Noise Abatement** - When noise impacts are identified through the NEPA process, feasible and reasonable noise abatement measures shall be incorporated into the project. Use of road surface treatment is not an acceptable noise abatement measure and is not eligible for Federal-aid participation
- **Encouraging Compatible Adjacent Land Use** - The Commission encourages those who plan and develop land, and local governments controlling development or planning land use near known freeway locations, to exercise their powers and responsibility to minimize the effect of highway vehicle noise through appropriate land-use control.
- **Noise Abatement by Others** - The Commission encourages developers and local governments to coordinate their efforts to mitigate highway noise without encroachment of MDOT's right-of-way unless authority is granted.

## **I.4 Qualifications Necessary to Perform Noise Analysis and Abatement Design**

Only individuals (MDOT or consultant staff) qualified in the field of highway traffic noise impact analysis shall be responsible for the highway traffic noise analysis for MDOT's transportation improvement projects. In order to be considered qualified, the person performing the analysis must have demonstrated experience in conducting highway traffic noise analyses for transportation improvement projects and must have exhibited a working knowledge of the procedures outlined in Report Number FHWA-DP-96-046, *Measurement of Highway-Related Noise*, May 1996; 23 CFR 772; and the State Transportation Commission's Policy on Noise Abatement (10136,) and the rules and procedures as defined in this handbook. The qualified individual must also have successfully completed the following:

- MDOT approved highway traffic noise analysis training; and
- Training on the most current version of the approved FHWA noise analysis computer model.

A copy of the individual's certificate of training must be included in their employer's prequalification packet provided to MDOT Lansing Office. Refresher and additional training may be necessary as a result of advanced highway traffic noise modeling technologies and changes in highway traffic noise policy and/or procedure.

## **I.5 Time-Related Factors and Their Effects on Noise Studies**

Several factors may influence the conduct of noise studies, the evaluation of noise impacts, and the selection of feasible and reasonable noise abatement features. The factors presented below are generally related to the influences of changes that may occur over time and/or between various phases of a project's development.

### ***I.5.1 Effects of Noise Guidance Revisions***

It is the intent of MDOT to update its noise guidance material on an as-needed basis to respond to policy changes and technical enhancements. Most recent example is this handbook (which supersedes MDOT's *Procedures and Rules for Implementation of State Transportation Commission Policy 10136 - Noise Abatement*).

Noise studies may have been performed in accordance with noise policies and guidance which have subsequently been modified. If CE determination, FONSI or ROD has not been issued before effective date of this revised MDOT policy, MDOT and other project applicants should consult FHWA to determine what revised or new noise analyses should be prepared. If the final NEPA approval has been issued before the effective date, the need to revise or update noise analyses will be discussed during the consultations as required by 23 CFR 771.129 before MDOT and other project applicants seek subsequent FHWA approvals.

### *I.5.2 Using Different Traffic Noise Models and Versions*

It is the intent of MDOT to utilize the most up-to-date and efficient modeling techniques in order to provide the most accurate and comprehensive noise analyses for its projects, as long as:

- these modeling techniques do not result in a reduction in the number of areas considered for noise abatement compared to the areas considered in previous noise studies and
- the newer modeling techniques do not result in any reduction of abatement measures determined to be likely based on the noise modeling performed in the previous noise studies.
- The model is approved by FHWA for use in noise abatement analyses.

**NOTE** – *Mandatory Use of the FHWA Traffic Noise Model version 2.5 (TMN2.5<sup>®</sup>)*

23 CFR 772.9(a) states that the TNM2.5<sup>®</sup> model must be used for traffic noise analysis, or “any other model determined by the FHWA to be consistent with the methodology of the FHWA TNM.” (Refer to 23 CFR 772.9(a) in Appendix I)

#### **I.5.2.1 Using Different Versions of the FHWA TNM**

For some projects, previous noise analyses may have been performed during earlier project phases using a currently outdated version of the FHWA TNM. Additional noise analyses for these projects may now be required because of a new project phase, the need to reevaluate the project, or for some other reason. In such instances, it is suggested that the most current version of the FHWA TNM be used for additional noise modeling.

#### **I.6 Contact Information**

MDOT will issue updates and/or make modification to this Handbook as necessary. Please direct questions, comments, or suggestions about this Handbook to the MDOT Lansing Office at one of the following addresses:

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Michigan Department of Transportation  
Bureau of Transportation Planning  
Environmental Section  
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