MISSOURI DEPARTMENT OF TRANSPORTATION

TRAFFIC NOISE POLICY

Prepared by MoDOT Preliminary Studies Division
Environmental Section
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MoDOT Noise Policy

Highway Traffic Noise Analysis and Abatement Guidelines

The purpose of this noise policy is to conform to the requirements of Title 23, Article 772, Code of Federal Regulations (23 CFR 772), and the noise-related requirements of the National Environmental Policy Act (NEPA) of 1969. The guidelines delineated here will determine the need, feasibility and reasonableness of noise abatement measures and provide the basis for statewide uniformity in analysis of traffic noise.

DEFINITIONS

Following are definitions for terms used in these guidelines:

Abatement -- measures used to mitigate or reduce traffic noise impacts.

Approach, as used in 23 CFR 772.5(g) -- noise levels [L(h)] which are 1 decibel (dBA) below the levels shown in the Noise Abatement Criteria (NAC; Table 1) of these Guidelines.

Barrier -- a solid wall or combination earthen berm and wall to provide traffic noise reduction for impacted receptors.

Berm -- earthen berm constructed to provide a traffic noise reduction for impacted receptors. Noise berms and noise barriers may be combined to provide noise abatement.

CFR -- Code of Federal Regulations.

dBA -- A-weighted decibel, unit used to measure noise which best corresponds to the frequency response of the human ear.

Design Year -- the future year used to estimate the probable traffic volume for which a highway project is designed, typically 20 years into the future.

Existing Noise Level -- the noise resulting from the natural and mechanical sources and human activity considered to be usually present in a particular area.

Impacted Receiver/Receptor -- Any receiver that has a loudest hour L_{eq} approaching (within 1 dB) or exceeding the Noise Abatement Criteria for the corresponding land use category, or exceeding existing noise levels by 15 dB.

Insertion Loss -- the difference in L_{eq} with and without the barrier (barrier level minus no barrier level). The insertion loss goal for each impacted sensitive receptor is 5 dBA or more.

L_{eq} -- the equivalent steady-state sound level; that is, the steady-state sound level for a stated period of time that contains the same acoustic energy as the time-varying sound level during the same time period.

$L_{eq}(h)$ -- the hourly value of L_{eq}.

NAC -- the Noise Abatement Criteria as shown in Table 1 of these Guidelines.

Receiver/Receptor -- specific location of outdoor activity on any property that is considered to contain noise-sensitive land use.

Substantially exceed the existing noise levels, as cited in 23 CFR 772.5(g) -- increases of 15 dBA or more above the existing noise level.

Traffic Noise Impacts -- impacts which occur when the predicted traffic noise levels approach or exceed the NAC or when the predicted traffic noise levels substantially exceed the existing noise levels.

Type I Project -- a proposed Federal or Federal-aid highway project for the construction of a highway on a new location, or for physical alteration of an existing highway that significantly changes either the horizontal or vertical alignment or increases the number of through-traffic lanes.

Type II Project -- a proposed Federal or Federal-aid highway project for noise abatement on an existing highway.

SELECTION OF LOCATIONS FOR ANALYSIS

Traffic noise analysis will be conducted for developed lands and undeveloped lands, for development that is planned, designed and programmed. Development will be deemed to be planned, designed and programmed if a building permit for a noise-sensitive land use (including but not limited to, a residence, school, church, hospital, or library) has been approved by the local agency with jurisdiction at the time of the noise analysis.

MoDOT will furnish the results of all highway traffic noise analyses to local government officials within whose jurisdiction a proposed highway project is located. Specifically, environmental documents and design noise reports will contain noise and other pertinent design information. Local officials should coordinate and distribute this information to the local area affected. Following this procedure will encourage planners, developers, and affected communities to practice noise-compatible development.

DATE OF PUBLIC KNOWLEDGE AND NOISE ABATEMENT

MoDOT is required to identify when the public is officially notified of the adoption of the location for a proposed highway project. This date establishes the "date of public knowledge" and determines the date after which Federal/State governments are no longer responsible for providing noise abatement for new development that occurs adjacent to the proposed highway project.

The date of public knowledge will be the date that a project's environmental analysis and documentation is approved, i.e., the date of approval of Categorical Exclusions (CE), Findings of No Significant Impact (FONSI) or Records of Decision (ROD). After this date, MoDOT is still responsible for analyzing changes in traffic noise impacts, when appropriate, but MoDOT is no longer responsible for providing noise abatement for new development that occurs adjacent to the proposed highway project. Provision of such noise abatement becomes the responsibility of local communities and private developers.

IDENTIFICATION OF TRAFFIC NOISE IMPACTS

TYPE I PROJECTS

A noise analysis will be conducted for all MoDOT Type I highway transportation projects where potentially impacted receivers are present. Analysis, whether by nomograph, STAMINA 2.0, or other FHWA-approved traffic noise model, should be done even if potential abatement may not be feasible or reasonable.

Analysis of traffic noise impacts is conducted in accordance with 23 CFR Part 772.9. The level of detail and effort required for the traffic noise analysis on each alternative of a proposed project should be commensurate with the type of project and the associated impacts and/or issues.

23 CFR Part 772.9 reads, in part:

"Analysis of traffic noise impacts and abatement measures.

(a) The highway agency shall determine and analyze expected traffic noise impacts and alternative noise abatement measures to mitigate these impacts, giving weight to the benefits and cost of abatement, and to the overall social, economic and environmental effects.

(b) The traffic noise analysis shall include the following for each alternative under detailed study:

(1) Identification of existing activities, developed lands, and undeveloped lands for which development is planned, designed and programmed, which may be affected by noise from the highway;

(2) Prediction of traffic noise levels;

(3) Determination of existing noise levels;

(4) Determination of traffic noise impacts; and

(5) Examination and evaluation of alternative noise abatement measures for reducing or eliminating the noise impacts."

Existing noise levels will be determined using FHWA's current noise measurement procedures, as described in "Sound Procedures for Measuring Highway Noise, Final Report."

Future noise levels will be predicted using FHWA's current highway traffic noise prediction model (e.g., "FHWA Highway Traffic Noise Prediction Model FHWA-RD-77-108").

A traffic noise impact is deemed to occur whenever the predicted traffic noise levels approach or exceed FHWA's NAC or whenever predicted traffic noise levels substantially exceed existing noise levels. "Approach" shall mean sound levels of one dBA less than the NAC, while "substantially exceed" shall mean an increase of at least 15 dBA from existing sound levels.

CONSIDERATION OF TRAFFIC NOISE ABATEMENT

Generally, traffic noise abatement will be considered whenever traffic noise impacts are identified. However, MoDOT will not normally provide abatement for Activity Category C (see Table 1) or in areas of mixed land use which are dominated by or changing to Activity Category C.

Traffic noise abatement measures will be implemented on a highway project if found to be reasonable and feasible. A discussion of the reasonableness and feasibility of abatement is presented in the next

section. The traffic noise analysis document will contain a discussion of the reasonableness and feasibility of abatement and the types of abatement measures considered, whether or not any abatement measures are implemented.

When noise impacts are shown to exist on a project, a number of possible noise abatement measures will be considered, including, but not limited to:

1. Traffic management measures: modified speed limits, traffic control devices, time-use restrictions for certain vehicles, and prohibition of certain vehicle types.

2. Changes in horizontal or vertical alignment to break the line of sight between receiver and source.

3. Noise barriers or berms: a noise barrier or berm must provide a noise reduction of 5 decibels or more for first-row receivers.

REASONABLENESS AND FEASIBILITY OF ABATEMENT

There are two main elements in the consideration of noise abatement: reasonableness and feasibility. The criteria and procedures used to determine reasonableness and feasibility should be objective enough to be quantifiable, but flexible enough to allow MoDOT to make meaningful judgments on a case-by-case basis for unusual or special circumstances. The following discussion covers feasibility and reasonableness of noise abatement.

FEASIBILITY

Feasibility deals with the engineering considerations of noise abatement, for example, topography, access, drainage, safety, maintenance, and if other noise sources are present. Feasibility is the ability to provide abatement in a given location with consideration to the physical and acoustical limitations of the site. MoDOT requires at least a 5 dBA insertion loss for first-row receivers for noise abatement to be considered feasible.

REASONABLENESS

The reasonableness evaluation of proposed noise abatement mitigation measures is more subjective than evaluation of feasibility. Reasonableness implies use of common sense and good judgment and is based on a number of factors. These factors include, but are not limited to:

(a) Noise wall must provide noise reduction of at least 5 dBA for all primary receptors. Primary receptors are those which are closest to the highway.
(b) Noise wall must provide attenuation for more than one receptor.
(c) Noise wall must be 18' (5.5m) or less in height above normal grade.

(d) Noise wall must not interfere with normal access to the property.
(e) Noise wall must not pose a traffic safety hazard.
(f) Noise wall must not exceed a cost of $30,000 per benefited receptor. A benefited receptor is defined as a receptor which receives a noise reduction of 5 dBA or more.
(g) The majority of the affected residents (primary and benefited receptors) must concur that a noise wall is desired.

Cost per residence: MoDOT has established that noise abatement will be considered reasonable if the cost to provide the abatement is $30,000 or less per receptor. All receptors that will benefit from noise abatement will be included in the cost index. Benefited receptors are all residences , including those which are not first-row residences, but which receive a 5 dBA reduction in noise or greater due to the implementation of traffic noise abatement.

Residences include all dwelling units, such as homes, apartments and mobile homes. Each first-floor apartment in an apartment complex will be counted as a separate dwelling unit.

Timing of development: This is an important factor in determining the reasonableness of noise abatement. MoDOT will give greater consideration to (1) residential areas along highways on a new location, (2) residential areas that were constructed before an existing highway, and (3) residential areas that have been in place along an existing highway for an extended period of time. MoDOT will give less consideration to residential areas that have developed along an existing highway without proper consideration of traffic noise impacts by the local community or developer.

Views of impacted residents or organizations: This mainly applies to projects in which a noise barrier or berm is being considered for noise abatement. Views of impacted residents will be a major factor in consideration of noise abatement. MoDOT will make every reasonable effort to solicit the views and opinions of impacted residents before making a final determination on the reasonableness and feasibility of noise abatement.

When considering the construction of noise abatement measures, MoDOT will consider any potential negative effects on the natural environment, as well as potential positive effects of noise reduction during highway construction. .

PUBLIC INVOLVEMENT

During the project development stage for a proposed highway project, informational meetings, both formal and informal, will be conducted to solicit comments, opinions and concerns from local officials and the public. A list of potentially affected areas and reasonable and feasible noise abatement measures will be developed and addressed in environmental documents prepared for the project. Likely noise abatement measures will be presented and discussed at the Design Public Hearing. Following public comment, a Final Noise Report will be prepared if needed. Abatement design measures deemed reasonable, feasible and cost-effective will be incorporated into the document.

COORDINATION WITH LOCAL OFFICIALS

Highway traffic noise should be reduced through a program of shared responsibility. Local governments should use their authority to regulate land development in such a way that noise-sensitive land uses are either prohibited from being located adjacent to a highway, or that developments are planned, designed, and constructed so as to minimize noise impacts.

It is MoDOT policy to furnish the results of highway traffic noise analyses to local government officials. Local coordination will specifically be accomplished through the distribution of highway project

environmental documents and noise study reports. MoDOT encourages local communities and developers to practice noise-compatible development.

EXTENUATING CIRCUMSTANCES

There may be extenuating circumstances where unique or unusual conditions (such as extremely noise-sensitive areas, Section 4(f) resources, etc.) warrant special consideration of highway traffic noise impacts and/or implementation of noise abatement measures. Extenuating circumstances will be considered on an individual case-by-case basis.

TYPE II PROJECTS

Noise abatement will be considered along existing highways if all of the following criteria are met:

(a) The noise abatement will only be considered on an existing highway that was built or expanded after the adjacent development which is to be protected had occurred or for adjacent land use which was in existence prior to May 14, 1976.

(b) The noise abatement must meet all of the criteria of the Type I Noise Abatement Policy.

(c) Existing highest sound levels must approach or exceed the NAC.

(d) The Type II noise abatement project must be eligible for federal funds and must be requested by a local government entity. The majority of the affected residents (primary and benefited receptors) must concur that a noise wall is desired.

(e) Any required adjustment to the existing highway will be considered part of the cost of the noise abatement.

(f) The local government entity must provide 75% of the cost. The Commission will provide the 25% matching funds. If the cost of the abatement exceeds $30,000 per benefited receptor, the local government entity will pay 100% of the cost exceeding the $30,000 per benefited receptor. A benefited receptor is defined as a receptor which receives a noise reductions of 5 dBA or more.

CONSTRUCTION NOISE

To reduce the impacts of construction noise, MoDOT has special provisions in the construction contract which requires that all contractors comply with all applicable local, state, and federal laws and regulations relating to noise levels permissible within and adjacent to the project construction site. Construction equipment will be required to have mufflers constructed in accordance with the equipment manufacturer's specifications. Further, MoDOT will monitor project construction noise and require noise abatement in cases where the criterion is exceeded.

NOISE ABATEMENT REVIEW TEAM

MoDOT will consider the style, architectural features and aesthetics of noise walls to ensure the following:

(1) The walls will blend into and with the surrounding area.

(2) The walls are visually pleasing to the residents of the area being served.

(3) The walls are visually pleasing to the through traffic on the route and do not detract from the overall aesthetics of the highway.

For each project requiring walls for noise abatement, a design review team consisting of a representative from the Design, Maintenance and Traffic, and Construction Divisions and a fourth member from a private architectural firm will review the designs and make recommendations for appropriate noise walls. The final design will be made in consultation with the residents of the areas.

TABLE I
NOISE ABATEMENT CRITERIA

Hourly A-weighted Sound Level -- decibels (dBA)

Activity Category	$L_{eq}(h)$	Description of Activity Category
A	57 (exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of these qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	Developed lands, properties, or activities not included in Categories A and B above.
D		Undeveloped lands.
E	52 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.