

**The Maryland Department of Transportation**  
**State Highway Administration**

**Highway Noise Policy**

**Date of Issuance: April 13, 2011**

**Effective Date: July 13, 2011**

**(Revised August 19, 2011)**

**FINAL**

# **Policy Overview**

## **► POLICY STATEMENT**

It is the policy of the Maryland Department of Transportation, State Highway Administration (SHA) to abate traffic-generated noise from state highways, for communities adjoining the highway, that meet the criteria for Type I or Type II abatement.

## **► POLICY GUIDANCE**

The Maryland Department of Transportation, State Highway Administration (SHA) Highway Noise Policy provides guidance for the evaluation of traffic noise effects and noise abatement opportunities for communities adjacent to state highways. Highway noise impacts are analyzed as either Type I or Type II situations, as defined in the Code of Federal Regulations (23 CFR 772), Procedures for Abatement of Highway Traffic Noise and Construction Noise. Section 772.5, in 23 CFR 772, provides definitions and additional terms related to the analysis and abatement of highway traffic noise.

- **Type I** projects are associated with the construction of new highways, capacity additions to existing highways, major operational improvements, and the construction or modification of specific highway-related facilities as defined in 23 CFR 772.5. Federal regulations require the evaluation of highway traffic noise impacts and consideration of abatement when certain highway improvements are being proposed.
- **Type II** projects assess impacts adjacent to existing fully controlled-access highways not being expanded, where the majority of the impacted development was built prior to the original construction or approval of a highway.

This policy was adopted with the approval of the Federal Highway Administration (FHWA) as meeting the intent of the provisions of 23 CFR 772, which require States to adopt their own policies on the abatement of highway traffic noise. Regulations and policies suggested in 23 CFR 772, and other Federal guidance documents, are consistent with the guidance outlined in this document. Revisions to this noise policy will not be retro-actively applied to past Type I or Type II decisions.

## **► FEDERAL PARTICIPATION**

The Maryland State Highway Administration's highway noise policy is applicable to projects funded with Federal and/or State funds, and projects funded by local jurisdictions or developers that are intended to be accepted by the State for operation and/or maintenance.

## **► APPEALS**

Appeals of decisions not to implement noise abatement on a particular project will be considered by the Secretary of the Department of Transportation and the State Highway Administrator. An appeal will be reviewed when there is a question regarding interpretation or application of the noise policy criteria, or the preparation and accuracy of the technical noise analysis. The noise policy criteria will not be a basis for appeal.

# Noise Abatement Evaluation

The evaluation of whether or not noise abatement will be considered for a community requires that three questions be considered:

- Does a noise **impact** currently exist, or is it projected to exist?
- Is the design of noise abatement **feasible**?
- Is the construction of noise abatement **reasonable**?

Each noise study area will be evaluated to determine if construction of abatement is both feasible and reasonable. This evaluation will be performed during the environmental clearance phase of project development. The final determination on the location, height, length, and noise reduction performance will be made during the final design phase of project development. Changes in the final design of a project will be re-evaluated for their effects on noise levels and to determine if noise abatement is still feasible and reasonable.

## ► IMPACT CRITERIA

Noise levels and impact criteria will be based on the one-hour, A-weighted equivalent sound level (Leq(h)), as defined in 23 CFR 772. The abbreviation for decibels in the A-weighted scaled is **dB(A)**.

Federal guidelines require that States define impact criteria that are at least 1 dB(A) less than the Noise Abatement Criteria (NAC) in the Code of Federal Regulations, based upon the identified type of activity or land use. Table 2 shows SHA's Noise Impact Levels, which are based off of the NAC; SHA's levels are set 1 dB(A) less than the NAC. The majority of noise sensitive areas that SHA evaluates fall within Activity Categories B and C. This typically includes ground level outdoor living spaces where frequent human use typically occurs, but may also include the evaluation of upper floors in certain instances. Activity Category B noise sensitive receptors are defined exclusively as residences. Category C noise sensitive receptors consist of non-residential land uses not specifically covered in Category A or B, as defined in Table 1.

**Table 1 to Part 772 Noise Abatement Criteria**  
***Hourly Equivalent A-Weighted Sound Level (decibels (dB(A))***

<b>Activity Category</b>	<b>Activity Criteria<sup>1</sup> Leq(h)<sup>2</sup></b>	<b>Maryland SHA Approach Criteria</b>	<b>Evaluation Location</b>	<b>Activity Description</b>
A	57	56	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 <sup>3</sup>	67	66	Exterior	Residential
C <sup>3</sup>	67	66	Exterior	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, daycare 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	52	51	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 <sup>3</sup>	72	71	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 The Leq(h) Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.
- 2 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.
- 3 Includes undeveloped lands permitted for this activity category.

The following are the impact levels that are most commonly used:

- **Type I:** A sensitive land use is impacted if:
  - Design year noise levels are projected to equal or exceed 66 dB(A) - **OR** -
  - Projected noise levels are anticipated to increase over existing year noise levels by the amount shown in Table 2. For example, if a land use has an existing noise level of 41 dB(A), the design year noise level would need to increase by at least 15 dB(A) for a noise impact to occur.

**Table 2**

<b>Existing Noise Level</b>	<b>Projected Increase</b>
45 dB(A) or less	15 dB(A)
46 dB(A)	14 dB(A)
47 dB(A)	13 dB(A)
48 dB(A)	12 dB(A)
49 dB(A)	11 dB(A)
50 dB(A) or greater	10 dB(A)

- **Type II:** A noise sensitive use is impacted if existing noise levels equal or exceed 66 dB(A).

## ► FEASIBILITY CRITERIA

Feasibility of noise abatement is defined as the engineering and acoustical ability to safely provide effective noise reduction. Noise abatement measures, such as noise barriers, earth berms, berm and noise barrier combinations, or soundproofing of publicly owned public buildings to mitigate interior noise impacts, will be analyzed for all impacted sites. The following criteria will be used in determining if noise abatement is feasible:

### Acoustic Considerations

- A modeled reduction of projected noise levels by at least 5 dB(A) at 50% of impacted sites, in any given noise sensitive area, will be considered feasible.
- Reduction of noise levels may be limited in areas where external noise sources exist, such as areas where aircraft flight paths exist. Implementation of a noise barrier, in situations such as this, may not be feasible.

### Safety & Access Considerations

- Noise abatement may not be feasible in areas where driveway access needs to be maintained, where local street access exists, or if pedestrian access would be restricted.
- Noise abatement measures that would create adverse safety conditions, such as limiting sight distance or reduction of a vehicle recovery area, will not be considered feasible.

## Site Constraint Assessment

When determining if noise abatement alternates are feasible, a Site Constraint Assessment (SCA) may be conducted when additional engineered elements, besides a typical noise wall system, are required. Examples of when an SCA will be performed include when:

- Extensive fill or excavation is needed to install noise abatement elements, due to topographic conditions.
- Significant utility relocations need to be performed, such as: substantial relocation of primary electrical lines, primary water main distribution systems, or primary sanitary sewer systems.
- Major drainage systems need to be implemented to accommodate changed drainage patterns or to avoid floodplain impacts through extensive site grading and/or roadway alignment adjustments.
- The introduction of structural elements is considered, such as performing major bridge re-construction or providing new structures for barrier placement.

The assessment will include alternate engineered options, an evaluation of permitting constraints, and the development of a construction estimate of the additional engineered elements.

### ► REASONABLE CRITERIA

A reasonable decision is based upon a combination of social, economic and environmental factors. These factors include the viewpoints of benefited property owners and residents, the number of benefited residences, the proposed acoustical effectiveness of the abatement, and the cost effectiveness of the proposed abatement.

#### ➤ Viewpoints of Benefited Property Owners & Residents

The viewpoints of benefited property owners and residents will be solicited during the environmental clearance phase of project development. The SHA will evaluate benefited property owner viewpoints, for individual Noise Sensitive Areas (NSA), during the Public Hearing commenting period of the environmental clearance phase. In the event that SHA receives opposing viewpoints from at least 25% of benefited residents within a NSA, a voting process will be administered. The voting process will require that more than 50% of benefited residents in the NSA be opposed to the noise abatement measure for the abatement to be deemed not reasonable.

#### ➤ Benefited Residences & Design Goal

- The total number of benefited residences will be the sum of the following:
  - The number of *impacted and non-impacted* residences that receive a 5 dB(A) or greater noise reduction.
  - The number of *impacted and non-impacted* non-residential noise sensitive facilities (i.e. schools, places of worship, etc.) that would benefit from abatement by receiving a 5 dB(A) or greater noise reduction. Noise sensitive facilities such as these, which have active public outdoor uses, will be weighted based on their linear frontage along the subject highway (refer to Linear Footage Factor – as described under Cost Effectiveness).

- At least 50% of benefited residences, in a defined Noise Sensitive Area (NSA), must receive at least a 7 dB(A) reduction from the proposed abatement in order for the abatement to be considered reasonable. This is the SHAs Noise Reduction Design Goal.

➤ Cost Effectiveness

Noise barriers that are determined to be feasible to design and construct also need to be evaluated for reasonable cost. SHA will consider either square footage of barrier per benefited residence or the linear frontage of property when determining the cost of a barrier. In certain instances, when additional engineered elements are identified through the Site Constraint Assessment, an additional cost analysis will be performed. The following methods will be considered in determining the cost of a barrier:

- Square Footage per Benefited Residence – A barrier system will be considered reasonable if the area of wall provided per benefited residence is equal to, or less than, 2,700 square feet. This measure will be used for.
  - Square Foot Averaging (*Type I Projects Only*) - SHA will assess both individual noise sensitive areas, along with the entire common noise environment, for cost effectiveness. The common noise environment is defined as a group of receptors, within the same Activity Category, that are exposed to similar noise sources and levels, traffic, and topographical features. In this instance, individual NSAs that have a square foot per residence exceeding 2,700 square feet, *but do not exceed 3,700 square feet*, will be re-assessed. If the square footage per residence for the entire common noise environment is calculated to be less than 2,700 square feet, then those NSAs considered for reevaluation would meet this reasonable criterion.
- Linear Footage Factor – There are activity categories that need to be considered for abatement, but are not residential in character. In these instances, an equivalent residence factor will be utilized. SHA will consider every 125 feet of linear frontage along a highway to be considered equivalent to one (1) residence. For example, if there is 1,000 linear feet of park land adjacent to a highway, it will be considered as eight (8) equivalent residences ( $1,000/125 = 8$ ). The square footage of the barrier system will be compared with respect to the equivalent residences.
- Site Constraint Assessment Analysis – When additional engineered elements are required, a cost of the barrier system will be evaluated. This will be performed by using annually updated highway estimate information to establish an allowable cost of barrier (based on the allowable square feet of wall per residence). A barrier system will be considered reasonable if the cost of the barrier plus the cost of additional engineered elements is less than, or equal to, the allowable cost of barrier.

# **Type I Program**

## **► NOISE ANALYSIS CONSIDERATION**

As defined in 23 CFR 772.5, a highway noise analysis will be considered for:

- The construction of a highway on new location
- The physical alteration of an existing highway where there is either:
  - 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.
  - 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 between the highway noise source and the receptor.
- The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane
- The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane
- The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange
- Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane
- The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza
- If a project is determined to be a Type I project under this definition then the entire project area as defined in the environmental document is a Type I project.

## **► ANALYSIS OF FUTURE NOISE IMPACTS**

Type I highway noise impacts will be determined by forecasting build conditions for the design year (typically 20-25 years into the future). This will be accomplished by using ambient (or existing) noise measurements, in combination with projected design year traffic volumes and design year truck traffic percentages, to assess highway noise impacts. Forecasts will consider traffic conditions that will generate the greatest amount of highway noise. This saturation point is determined by considering the greatest amount of traffic volume that continues to travel at a free flow speed. Highway noise analyses will utilize the current Federal Highway Administration approved noise prediction model. Other elements of the analysis include the following:

- Noise impacts will be analyzed for noise sensitive land uses (i.e. residences, schools, places of worship, historic sites) that existed, or were permitted for construction, prior to the location approval of the project.
- Residences include all dwelling units. For buildings containing multiple dwelling units, each impacted unit will be analyzed and considered as a separate residence.
- Analysis of noise impacts and abatement will focus on exterior, ground level receptors.

**► DATE OF PUBLIC KNOWLEDGE**

- Traffic noise analyses will be performed for developed lands and undeveloped lands. Sites that have existing noise sensitive land uses will be evaluated for noise abatement. If a building permit has been issued for a site where a noise sensitive land use is planned, prior to the date of public knowledge for the highway project, the site will be evaluated for noise abatement. Noise impacts will be documented for all other undeveloped lands; however these areas will not be considered for noise abatement.
- The date of public knowledge is the date that a project receives location approval. Location approval occurs when the Federal Highway Administration approves the final environmental document. New noise sensitive development which occurs adjacent to a proposed state highway project after this date is not eligible for noise abatement consideration.
- Types of final environmental documents include: Categorical Exclusions, Finding of No Significant Impact, and a Record of Decision.
- Noise abatement for new development occurring after the date of public knowledge is the responsibility of the local jurisdiction, private developers, and/or individual property owners.

## **Type II Program**

The Type II, or retrofit, program considers abatement measures for communities that were constructed before construction of the original highway. SHA considers eligibility and local participation requirements in administering the Type II program:

**► ELIGIBILITY CRITERIA**

- The majority of the impacted residences, or other noise sensitive sites, must have been built prior to the system opening date of the original highway.
- Communities must be adjacent to an existing fully access controlled highways; where ingress and egress to the highway is via grade-separated interchanges.
- The Type II program is voluntary but must meet Federal requirements when Federal Aid is used for construction.

## ► LOCAL PARTICIPATION

- The Type II program only applies to communities in counties with development regulations or land use controls requiring the provision of noise protection for new noise sensitive development adjacent to state highways. SHA has examples of existing development regulations regarding highway traffic noise that can be considered by local officials.
- At least 75% of the potentially impacted homes in a community that are adjacent to the highway must provide written concurrence before preliminary engineering will be initiated. When a request for consideration is received, the SHA will mail vote cards to the property owners of improved noise sensitive parcels, adjacent to the highway, informing them of the request, and will solicit a vote for or against performing an analysis. This commitment will entail a study of noise levels to determine the degree of noise impact and whether a barrier is feasible and reasonable.
- Right of way that may be required for the construction or permanent location of Type II noise abatement must be donated to the State, including necessary easements for barrier maintenance, and utility relocations.
- The local jurisdiction must agree to fund 20% of the total engineering and construction cost before the State will consider funding.

Programming for design and construction of Type II noise abatement that is feasible and reasonable will be based upon the availability of funds in the Maryland Department of Transportation's Consolidated Transportation Program (CTP).