

# Federal Highway Administration

## Highway Traffic Noise Frequently Asked Questions

### Table of Contents

#### A. General

- A1. What are the Federal standards for highway traffic noise?
- A2. What are the responsibilities of the FHWA and state departments of transportation regarding implementation of 23 CFR 772?
- A3. I have concerns about traffic noise levels in my community. What agency should I contact?
- A4. When does 23 CFR 772 apply to a project?
- A5. What are the differences between NEPA and 23 CFR 772 in considering traffic noise impacts?
- A6. Does the noise analysis performed to satisfy 23 U.S.C. 109(i) and 23 CFR 772 satisfy all noise analysis requirements for highway projects under NEPA?
- A7. Are payments allowed for noise damages?
- A8. What is Noise Compatible Planning (NCP)?
- A9. What is the focus of the FHWA Noise Abatement Criteria (NAC)?
- A10. What level of noise analysis is needed for a transit only project requiring limited FHWA participation?

#### B. Noise Analysis

- B1. What triggers the requirement to complete a noise analysis?
- B2. What is the maximum effective distance for noise barriers as an abatement measure?

#### C. Project Definitions

- C1. What is a Type I project?
- C2. How does the FHWA define auxiliary lanes when determining a Type I project?
- C3. Is the removal of an existing noise barrier a Type I project?
- C4. What is a Type II project?
- C5. What is a Type III project?

#### D. Land Use Considerations

- D1. What are the FHWA Noise Abatement Criteria (NAC)?
- D2. Activity Category A Land Use
  - a. What is an Activity Category A land use?
  - b. Must a site already be serene and quiet to receive an Activity Category A determination?
  - c. Are there any examples of Activity Category A classifications that help with making future determinations?
  - d. Does the Activity Category A determination apply to an entire property, or can it apply to a specific site within a larger area?
  - e. Will FHWA classify undeveloped lands as an Activity Category A land use?
  - f. Does a project sponsor have an obligation to make a site serene and quiet to receive an Activity Category A designation?

- g. Does the frequent human use requirement (23 CFR 772.11(b) and Table 1) apply to Activity Category A land uses?
- h. What process does FHWA use to make Activity Category A designations?

D3. What is an Activity Category B land use activity?

D4. Activity Category C Land Use Activity

- a. What is an Activity Category C land use activity?
- b. How does FHWA define a medical facility as used in 23 CFR 772?
- c. How is noise considered in evaluating use of Section 4(f) lands?
- d. How are noise impacts addressed in regard to historic properties in the context of Section 106 of the National Historic Preservation Act?
- e. How are trails and trail crossings defined in the context of 23 CFR 772?

D5. What is an Activity Category D activity?

D6. What is an Activity Category E activity?

D7. What is an Activity Category F activity?

D8. What is an Activity Category G activity?

- a. How does FHWA define "permit" under 23 CFR 772?

D9. What is the applicable Activity Category for undeveloped portions of a natural area or preserve with no exterior areas of frequent human use?

D10. What is the applicable Activity Category for a natural area or preserve with exterior areas of frequent human use?

D11. What is the applicable Activity Category for a rest stop or rest area?

#### E. Determination of Noise Levels

E1. How are existing noise levels determined?

E2. How are future noise levels determined?

E3. What is the method for analyzing abatement for multi-story land uses, such as multi-family apartments or condominiums?

E4. What is the methodology for analyzing Activity Category C, D and E land uses?

E5. How do we determine and abate noise levels for Category D (interior) activities?

#### F. Identifying Noise Impacts

F1. How do we determine noise impacts?

F2. What is a substantial increase in noise level?

F3. Can noise analysts use the TNM contours function to determine impacts or analyze abatement considerations?

F4. What noise barrier standards are required?

#### G. Noise Abatement

G1. Are states required to provide abatement when the analysis identifies noise impacts resulting from the project?

G2. What is "feasible" highway traffic noise abatement?

G3. What is "reasonable" highway traffic noise abatement?

G4. What types of abatement measures are eligible for Federal-aid funding?

G5. Can states use quieter pavement as abatement?

- G6. Does vegetation reduce noise levels?
- G7. Whom does the state DOT survey to obtain viewpoints?
- G8. When should the solicitation of viewpoints occur to satisfy the requirement in 23 CFR 772.13(d)(2)(i)?
- G9. What is the process for analyzing multi-family dwellings for impacts and consideration of abatement?
- G10. When only one side of the highway has a noise barrier, does the noise level increase for the opposite side of the highway where there is no noise barrier?
- G11. Why are some communities eligible for noise abatement while others are not?

## **A. General**

### **A1. What are the Federal standards for highway traffic noise?**

The Federal noise regulation at 23 CFR 772 constitutes the official Federal noise standards. The standards include the Noise Abatement Criteria along with all other requirements of 23 CFR 772, such as prediction of noise levels, abatement, information for local officials and construction noise. The entire Part 772 is the Noise Standard.

### **A2. What are the responsibilities of the FHWA and state departments of transportation regarding implementation of 23 CFR 772?**

The Federal Highway Administration (FHWA) is the designated government agency for administering the Federal-aid highway program. This program makes funds available to the States to assist in their highway construction and improvement programs. The States select the projects they will undertake by priority and develop these projects according to Federal requirements while considering project alternatives and potential impacts. The States are also responsible for the planning, design, and construction of highways within their jurisdictions. FHWA reviews each State's noise policy to make sure it satisfactorily meets Federal requirements. Additionally, FHWA provides technical advice and approvals at key stages of project development.

Each State transportation agency (including the District of Columbia and Commonwealth of Puerto Rico) is required to have a noise policy that is consistent with the FHWA noise standard. The State noise policies have all been reviewed and approved by FHWA for consistency with the FHWA noise standard.

### **A3. I have concerns about traffic noise levels in my community. What agency should I contact?**

Since each State has specific knowledge of the highway projects in their State, you should contact the State Department of Transportation (SDOT). The FHWA Division Office in your State can provide the contact information for the SDOT noise analysis section. The SDOT noise contact will be able to address public concerns regarding a specific project, noise complaint, or request for a noise barrier.

### **A4. When does 23 CFR 772 apply to a project?**

The regulation applies in the cases described in 23 CFR 772.7(a):

“(a) This regulation applies to all Federal or Federal-aid Highway Projects authorized under title 23, United States Code. Therefore, this regulation applies to any highway project or multimodal project that:

- (1) Requires FHWA approval regardless of funding sources, or
- (2) Is funded with Federal-aid highway funds.”

**A5. What are the differences between NEPA and 23 CFR 772 in considering traffic noise impacts?**

There is a major difference between NEPA and 23 CFR 772 requirements for determining traffic noise impacts. NEPA requires comparison of a proposed alternative with a baseline (the no-build alternative or no action alternative, in the design year) to determine whether traffic noise impacts will occur. The proposed project itself must create the traffic noise impact. However, 23 CFR 772 utilizes the opportunity provided by a proposed project to consider mitigating current as well as future noise problems. Therefore, under 23 CFR 772, if the predicted noise level approaches or exceeds the Noise Abatement Criteria, there is a traffic noise impact regardless of whether or not the proposed project is the cause. Even if noise levels decrease in the future, e.g. from 72 dB(A) to 69 dB(A), at a Category B site, there is still a traffic noise impact, and noise abatement must be considered.

**A6. Does the noise analysis performed to satisfy 23 U.S.C. 109(i) and 23 CFR 772 satisfy all noise analysis requirements for highway projects under NEPA?**

It is FHWA’s view that the noise analysis performed to satisfy the requirements of 23 CFR 772 generally satisfies the requirements under NEPA. However, some Type III projects may require additional analysis of traffic noise impacts on wildlife or historic properties, or for unusual circumstances where the project will increase noise levels, but does not include activities classified as a Type I project.

NEPA also requires analysis of the no build or no action alternative, which is not a requirement of 23 CFR 772. Some state DOT noise policies require analysis of the future no build case to satisfy the NEPA requirement. States may also find analysis of the future no build useful to compare future no build and future build noise levels because there are circumstances where project construction reduces future noise levels. For example, if a project’s purpose is to straighten out a curve, in which the alignment moves away from sensitive receptors, comparing the future build to future no-build could potentially show reductions in noise levels due to the project.

#### **A7. Are payments allowed for noise damages?**

States cannot use Federal-aid funds to compensate property owners for noise damages, but can use Federal-aid funds for noise abatement. Eligible noise abatement measures are listed at 23 CFR 772.15(c) and include noise barriers, traffic management measures, alteration of horizontal and vertical alignments, acquisition of land as buffer areas in predominantly undeveloped areas, and noise insulation of Activity Category D land use facilities. Normally, State DOT's provide noise abatement by contracting construction of highway traffic noise abatement measures to a third-party.

#### **A8. What is Noise Compatible Planning (NCP)?**

Reducing highway traffic noise is a shared responsibility between Federal, State and Local governments. The FHWA encourages State and Local governments to practice compatible land use planning and control near highways. The FHWA also encourages local governments to use their authority to regulate land development to either prohibit development of noise sensitive land uses adjacent to highways or establish requirements for developers to plan, design, and construct noise sensitive development using methods that minimize noise impacts.

The prevention of future impacts is one of the most important parts of noise control. New development and highways can be compatible. But, local government officials need to know what noise levels to expect from a highway and what techniques they can use to prevent future impacts. The regulation requires that States at a minimum must provide the distance to the approach criteria for each land use category on undeveloped lands (23 CFR 772-17(a)(2)). States may accomplish this by including a table of future noise levels at specific locations or a figure of distances to typical noise levels along the roadway. Title 23 CFR 772.17 requires states to provide this information to local governments. Making this information available for real estate transactions informs developers about the potential for future noise impacts. The regulation also requires that the state make local officials aware of the eligibility requirements for Federal-aid participation in Type II projects. Implementation of NCP will help eliminate situations where the State DOT is unable by law to provide noise mitigation. Please visit our NCP webpage for additional information.

#### **A9. What is the focus of the FHWA Noise Abatement Criteria (NAC)?**

The FHWA NAC focuses on levels where highway traffic noise could potentially interfere with speech communication in exterior areas. 23 CFR 772's primary focus is on determining traffic noise impacts and considering noise abatement for exterior areas of frequent human use.

#### **A10. What level of noise analysis is needed for a transit only project requiring limited FHWA participation?**

The determination of whether to use FHWA or FTA's noise analysis and procedures depends upon the specific circumstances of a project. The FHWA noise regulation under 23 CFR part 772 applies to multimodal projects, even though the term "multimodal" is not defined in the regulation. A proposed

transit project that would share an existing highway right-of-way (ROW) is not necessarily a multimodal project under 23 CFR 772.7(a). A transit-only project that meets all three of the following criteria is not considered a multimodal project for purposes of 23 CFR part 772:

1. **Lead Agency:** The Federal Transit Administration (FTA) is the lead agency in the National Environmental Policy Act (NEPA) process. The FHWA's limited participation is as a cooperating agency.
2. **Project Purpose:** The main transportation purpose of the project, as stated in the purpose and need statement of the NEPA document, is transit-related and not highway-related.
3. **Funding:** No Federal-aid highway funds are being used to fund the project.

Transit-only projects that meet all three criteria should use the FTA's Transit Noise and Vibration Impact Assessment Guidance Manual procedures to consider noise associated with the transit projects and any highway elements directly affected by the transit projects.

## **B. Noise Analysis**

### **B1. What triggers the requirement to complete a noise analysis?**

State highway agencies must complete a noise analysis for any project where 23 CFR 772.7(a) applies and the project includes any activity included in the list of Type I or Type II projects shown below.

### **B2. What is the maximum effective distance for noise barriers as an abatement measure?**

The maximum effective distance of a noise barrier depends on a variety of factors including the site geometry, the height of the barrier, the presence of noise sources other than the project, and meteorological effects, among others. For additional information on the limitations for using TNM to design noise barriers, see the TNM FAQ #26 under "Barriers", at: [http://www.fhwa.dot.gov/environment/noise/traffic\\_noise\\_model/tnm\\_faqs/faq07.cfm#mibarriers1](http://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_faqs/faq07.cfm#mibarriers1)

## **C. Project Definitions**

### **C1. What is a Type I project?**

Type I project is defined in 23 CFR 772.5:

1. The construction of a highway on a new location; or,
2. The physical alteration of an existing highway where there is either:
  - i. 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;
  - ii. 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 traffic noise source and the receptor; or

3. 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; or,
4. The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,
5. The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,
6. Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
7. The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.
8. 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.

### **C2. How does the FHWA define auxiliary lanes when determining a Type I project?**

The FHWA noise guidance recommends that State highway agencies take a broad approach to defining auxiliary lanes with respect to Type I projects as defined in paragraph (4) of the definition of Type 1 project in 23 CFR 772.5. Although the function of an auxiliary lane differs depending on the type of facility, an auxiliary lane should classify the project as Type I if the auxiliary lane is 2,500 feet or longer (see the AASHTO Policy on Highway Design or Green Book and Institute of Transportation Engineers (ITE) Manual “Freeway and Interchange Geometric Design Handbook” for more information).

### **C3. Is the removal of an existing noise barrier a Type I project?**

The removal of an existing noise barrier would most likely be a Type I project if the removal of the noise barrier meets the Type I definition of “substantial vertical alteration” under 23 CFR 772.5. The removal of an existing noise barrier may remove shielding by altering the topography, thereby exposing the line-of-sight between the highway traffic source and the sensitive noise receptors.

### **C4. What is a Type II project?**

Also called a retrofit project for noise abatement, a Type II project as defined in 23 CFR 772.5, provides noise abatement on an existing highway per 23 CFR 772(7)(d), participation in a Type II program. The regulation limits Federal participation in the funding of such projects to noise abatement measures (barriers) along lands developed prior to construction of the original highway. FHWA participation in Type II projects also requires that the State develop a system to prioritize projects using a variety of factors in accordance with 23 CFR 772.7(e). Typically, these factors include the density of development, traffic volumes and the age of the community among others.

### **C5. What is a Type III project?**

Type III projects include all projects subject to 23 CFR 772.7(a) that do not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

**D. Land Use Considerations**

**D1. What are the FHWA Noise Abatement Criteria (NAC)?**

The FHWA NAC are objective absolute noise levels for varying land use categories that are used to determine if and where traffic noise impacts occur, as defined in 23 CFR 772.5. States must consider noise abatement measures where impacts occur and must include abatement in the project plans, specifications and estimates if abatement is found to be feasible and reasonable.<sup>1</sup>

**Table 5 : 23 CFR Part 772, Table 1 Noise Abatement Criteria (NAC) Hourly A Weighted Sound Level in Decibels (dBA)**

Activity Category	L <sub>eq</sub> (h)	L <sub>10</sub> (h) <sup>2</sup>	Analysis Location	Description of Activity Category
A	57	60	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	70	Exterior	Residential.
C <sup>3</sup>	67	70	Exterior	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care 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	55	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	72	75	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.

<sup>1</sup>Either  $L_{eq}(h)$  or  $L_{10}(h)$  (but not both) may be used on a project.

<sup>2</sup>Either  $L_{eq}(h)$  and  $L_{10}(h)$  Activity Criteria values are for impact determination only, and are not design standards for noise abatement measures.

<sup>3</sup>Includes undeveloped lands permitted for this activity category.

## D2. Activity Category A Land Use

### a. What is an Activity Category A land use?

Activity Category A includes 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. The regulation further requires all highway agencies to submit a justification to FHWA on a case-by-case basis for approval of Activity Category A designation for locations identified as potential Activity Category A land uses. The following FAQs clarify FHWA’s approach to Activity Category A land use determinations and provides a test for Activity Category A designations.

Activity Category A land uses have a lower noise impact level at approach or exceed 57 dB(A)  $L_{eq}(h)$ , per 23 CFR772, Table 1. . It is important to note that noise abatement for impacts to Activity Category A land uses will be evaluated for feasibility and reasonableness in the same manner as noise abatement for all other land uses listed in Table 5.”

### b. Must a site already be serene and quiet to receive an Activity Category A determination?

Yes. Please see the evaluation criteria in the Test for Meeting Activity Category A Designation below.

### c. Are there any examples of Activity Category A classifications that help with making future determinations?

In making the determination, FHWA looks to examples of existing Activity Category A designations such as the Tomb of the Unknown Soldier at Arlington National Cemetery and the Wolf Trap Amphitheater. New Activity Category A determinations should be locations of similar character and significance.

**d. Does the Activity Category A determination apply to an entire property, or can it apply to a specific site within a larger area?**

When the considered use occurs in a particular area of a property the consideration for an Activity Category A determination occurs on a “site” basis rather than considering the entire property. For example, The Tomb of the Unknowns is an Activity Category A designated land use within the Arlington National Cemetery, which is not an Activity Category A land use.

**e. Will FHWA classify undeveloped lands as an Activity Category A land use?**

Undeveloped lands fall under Activity Category G in Table 1 to Part 772: Noise Abatement Criteria. If undeveloped land is permitted for development as a Activity Category A land use then the requirements of 23 CFR 772.11(c)(2)(vii)(B) apply.

**f. Does a project sponsor have an obligation to make a site serene and quiet to receive an Activity Category A designation?**

No, as with all Activity Categories listed in Table 1, the NAC value is only for the purpose of determining impacts. If impacts are determined, the Activity Category A land use is applied against the same feasible and reasonable criteria as any other Activity Category land use in Table 1. Therefore, the regulation does not require that noise levels be lowered to the NAC value. The definition of an Activity Category A land use includes serene and quiet, but for the reasons stated above, the regulation does not require that noise levels be lowered to achieve a serene and quiet setting.

**g. Does the frequent human use requirement (23 CFR 772.11(b) and Table 1) apply to Activity Category A land uses?**

Title 23 CFR 772 considers noise impacts on the human environment, thus a site must have frequent human use to receive classification as an Activity Category A land use. Serenity and quiet may be desirable at a wildlife preserve, but it would not be considered for Activity Category A classification if no human use occurs at the site.

**h. What process does FHWA use to make Activity Category A designations?**

The FHWA uses the following process to make Activity Category A designations:

Test for Meeting Activity Category A Designation

In order to meet the requirements for Activity Category A designation, evaluate the site and related activity in accordance with, and in compliance with, the above questions and answers and answer all of the following questions in the affirmative:

**Serenity and Quiet** Question: Is the site currently serene and quiet?

- Yes, if the current  $L_{eq}$  noise level does not approach or exceed the Activity Category A Noise Abatement Criterion (NAC) during any period when serving its intended purpose.
- No, if the current  $L_{eq}$  approaches or exceeds the Category A NAC during any period when serving its intended purpose.

**Public Need** Question: Does the site currently serve an important public need?

- Yes, if there is an important benefit of the public visiting or using the site due to its historical, religious, cultural, or natural significance.
- No, if there is no benefit.

**Intended Purpose** Question: Is the preservation of serenity and quiet essential to serve the site's intended purpose?

- Yes, if the intended use of the site in the future (design year) will continue to have historical, religious, cultural, or natural significance.
- No, if the current intended purpose of the site will change in the future in a manner that will not require serenity and quiet.

**Frequent Human Use** Question: Is the site frequently used (or frequently available for use) by the public?

- Yes, if the public can access the site during all times when it is available and able to serve its intended purpose. NOTE: The owner of a site may limit the number of visitors at a given time in order to conserve the site's serenity and quiet.
- No, if, with the exception of limits of usage established to maintain a site's serenity and quiet, the public is restricted from using the site during certain periods when the site is still available to serve its intended purpose.

**Determination:** If the answers to ALL of the above questions are yes, the SDOT should send supporting documentation to the appropriate FHWA Division Office and participate in any necessary additional coordination with FHWA staff to finalize the eligibility determination. If the answer(s) to any of the above questions is no, SDOTs must include this information in the project's noise documentation in accordance with the SDOT's noise policy and send the documentation to the FHWA

Division Office as required by the FHWA noise regulation and/or the SDOT's noise policy.

### **D3. What is an Activity Category B land use activity?**

Activity Category B includes single and multi-family residences. Residential hotels and motels that function as apartment dwellings should also be treated as Category B.

### **D4. Activity Category C Land Use Activity**

#### **a. What is an Activity Category C land use activity?**

Activity Category C includes active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, day care 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. Each State DOT must adopt standard practices for analyzing these land uses that is consistent and uniformly applied statewide.

#### **b. How does FHWA define a medical facility as used in 23 CFR 772?**

For the purposes of 23 CFR 772, the FHWA defines a medical facility as an inpatient medical facility where medical treatment and care occurs.

#### **c. How is noise considered in evaluating use of Section 4(f) lands?**

The requirements of Section 4(f) are separate from 23 CFR 772, but may also call for consideration of noise impacts to lands subject to Section 4(f). A noise impact does not necessarily constitute a Section 4(f) use. However, even when noise increases do not constitute a Section 4(f) use, noise impacts may still require consideration for abatement under 23 CFR 772. Abatement measures may result in additional impacts that require consideration under Section 4(f), NEPA, Section 106, or as visual impacts.

Section 23 CFR 774.15 of FHWA's regulations governing implementation of Section 4(f) include specific discussion to aid in assessing whether noise impacts would constitute a constructive use and require a Section 4(f) evaluation. In general, a constructive use occurs when "The projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a property protected by Section 4(f)". Examples include, hearing performances at an outdoor amphitheater, sleeping in a campground, visiting a historic site where a quiet setting is related to the site's significance, enjoying an urban park where serenity and quiet are significant attributes, or viewing wildlife in an area of a refuge intended for such viewing.

Conversely, 23 CFR 774.15(f) states that a constructive use does not occur when the impact of projected traffic noise levels of the proposed highway project on a noise-sensitive activity do not exceed the FHWA noise abatement criteria or the increase in the projected noise levels of the proposed project is barely perceptible (3 dB(A) or less).

**d. How are noise impact addressed in regard to historic properties in the context of Section 106 of the National Historic Preservation Act?**

As with Section 4(f), the consideration of historic properties under Section 106 is a separate requirement, but may be related to the assessment of noise impacts under 23 CFR 772. There is no metric for analyzing when a change in noise constitutes an effect under the regulations implementing Section 106 (36 CFR Part 800), since that will be dependent on the contributing characteristics and use of the historic resource. Some properties, such as designed or cultural landscapes where the landscape itself is the significant feature or where the setting is especially important, may be extremely sensitive to any change that can be perceived by the human ear. In such cases FHWA considers anything above 3 dB(A) to be a change that should be considered an effect. These cases should be assessed to determine whether it could adversely affect the contributing characteristics of the property. Other historic properties, such as historic transportation facilities, could be relatively unaffected by noise. It depends on the resource as to when noise impacts may diminish the integrity of a property's significant historic features, including a change in character of the property's setting or use [see 36 CFR 800.5(a)(1) and (2)]. Mitigation to address impacts of noise to a historic property is a separate matter from any abatement determined justified under 23 CFR 772, and as with Section 4(f) properties, the abatement measures may present additional impacts to be considered.

**e. How are trails and trail crossings defined in the context of 23 CFR 772?**

Trails and trail crossing are Activity Category C land use activities under 23 CFR 772.

Trails are defined in 23 USC 206(a)(2)(A-F) of the recreational trails program and require a noise analysis under 23 CFR 772. Motorized activities as described in 23 USC 206(a)(2)(G) are noise generators (Activity Category F) and consideration for noise impacts is not required.

Trail crossings describe locations where trails cross surface transportation facilities.

**D5. What is an Activity Category D activity?**

Activity Category D includes 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. Highway agencies consider abatement of interior locations at Category D land uses where exterior abatement is not feasible or reasonable.

**D6. What is an Activity Category E activity?**

Activity Category E includes a variety of commercial activities such as hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F. As stated in question D11, residential hotels and motels that function as apartment dwellings should be treated as Activity Category B.

**D7. What is an Activity Category F activity?**

Activity Category F includes a variety of land uses that are not considered sensitive to noise such as 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. Retail facilities under Category F include development such as malls, stores and shops.

**D8. What is an Activity Category G activity?**

Activity Category G includes undeveloped lands without a permit for future development. Treat undeveloped lands with a permit by the date of public knowledge as the developed use for the purposes of the noise analysis and consideration for abatement of project related noise impacts.

**a. How does FHWA define “permit” under 23 CFR 772?**

FHWA defines “permit” as used in category G as a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit. As of the effective date (July 13, 2011) of the current 23 CFR 772, FHWA eliminated “planned, designed and programmed” land use and requires issuance of a building permit as the trigger to indicate a definite commitment to develop the property in question has occurred. Some areas do not issue building permits. In these cases, the highway agency may use other triggers such as the presence of foundations to indicate a commitment to develop.

**D9. What is the applicable Activity Category for undeveloped portions of a natural area or preserve with no exterior areas of frequent human use?**

The appropriate activity category of natural areas, preserves, or similar locations with no exterior areas of frequent human use is Activity Category G, defined in 23 CFR 772 as undeveloped lands with no permitted use. In these cases, the SDOT must provide information on noise compatible planning concepts and the best estimation of the future design year noise levels to the appropriate local officials (see 23 CFR 772.17). In this case, FHWA also recommends providing that information to the landowner or landowner’s representative of the undeveloped land.

**D10. What is the applicable Activity Category for a natural area or preserve with exterior areas of frequent human use?**

Portions of natural areas, preserves, or similar locations with exterior areas of frequent human use normally receive an Activity Category C classification. This category includes cemeteries, schools, places of worship and other uses where serenity and quiet are desirable, but that do not meet the Activity Category A designation requirements.

**D11. What is the applicable Activity Category for a rest stop or rest area?**

The addition of a new or substantial alteration of an existing rest stop or rest area is a Type I project, per paragraph (7) of the Type I definition in 23 CFR 772.5, since either activity results in expansion of the highway facility. When assessing a rest stop or rest area for noise impacts, the Activity Category to be used will depend on the use of the rest stop. If the rest stop is designed and used to park vehicles, in particular heavy vehicles, then the rest stop is functioning more as a noise generating land use and should be categorized as Activity Category F. If the rest stop is designed and used in a park-like setting, such as those along scenic routes, then the rest stop should be treated as a noise sensitive land used under Activity Category C. As with any land use that is not listed on Table 1 of 23 CFR 772, the best approach is to investigate the site to determine how users interact with the site and classify the site accordingly.

**E. Determination of Noise Levels**

**E1. How are existing noise levels determined?**

Existing noise levels are determined by using one of the following methods:

1. Perform sound level measurements at representative receptors taken during the worst noise hour;
2. Predict noise levels using the FHWA Traffic Noise Model; or,
3. Use a combination of sound level measurements and prediction with a validated Traffic Noise Model. Measurements should occur during free flow traffic conditions and do not need to occur during the worst noise hour.

**E2. How are future noise levels determined?**

Future noise levels are determined by using the FHWA Traffic Noise Model® (FHWA TNM®) or any other model deemed by the FHWA as being consistent with the methodology of TNM per 23 CFR 772.9(a). For additional information on TNM, see the TNM FAQs at:

[http://www.fhwa.dot.gov/environment/noise/traffic\\_noise\\_model/tnm\\_faqs/](http://www.fhwa.dot.gov/environment/noise/traffic_noise_model/tnm_faqs/)

**E3. What is the method for analyzing abatement for multi-story land uses, such as multi-family apartments or condominiums?**

Generally, it is not feasible and/or reasonable to build a noise barrier tall enough to mitigate noise for floors above the ground floor level. For instances where the highway is elevated it is possible

that upper floors of adjacent buildings approach the same elevation as the highway and abatement for impacts to exterior areas at upper floors may be feasible and reasonable. Therefore, the analysis may result in abatement for the ground floor or upper floors in some cases. There may be situations, specific to local terrain or other shielding objects, where a noise barrier is warranted, reasonable and feasible for higher floors.

#### **E4. What is the methodology for analyzing Activity Category C, D and E land uses?**

Activity Category C, D and E land uses are generally any location that is not a residence, but may be sensitive to noise impacts. This would include any of the land uses listed in Categories C, D and E above. Each highway agency has methodologies in the noise policy that provides approaches to determining the number of receptors represented by a land use.

#### **E5. How do we determine and abate noise levels for Category D (interior) activities?**

If no exterior areas of frequent human use are present, then consider the NAC Category D activity. One commonly used method for determining an interior noise level is to measure the exterior noise level and use Table 7 from the [Highway Traffic Noise Analysis and Abatement policy \(PDF 325KB\)](#) to subtract from the exterior value and determine the interior noise level. The regulation does not allow Federal-aid funding for residential noise insulation.

### **F. Identifying Noise Impacts**

#### **F1. How do we determine noise impacts?**

A traffic noise impact occurs when the existing noise levels for a Type II project or future (design year) noise levels for a Type I project approach or exceed the noise abatement criteria (NAC) or when predicted future traffic noise levels substantially exceed the existing noise level even though the predicted levels may not exceed the NAC. This definition reflects the FHWA position that traffic noise impacts can occur under either of two separate conditions:

- When noise levels are unacceptably high (absolute level); or
- When a proposed highway project will substantially increase the existing noise environment (substantial increase)

Adequate assessment of the noise impact of a proposed project requires analysis of both criteria. The FHWA noise regulation requires State DOTs to establish a definition of "approach" that is at least 1 dB(A) less than the NAC for use in identifying traffic noise impacts in traffic noise analyses.

#### **F2. What is a substantial increase in noise level?**

For Type I projects, States are required to define a substantial increase in noise levels within a range of a 5 to 15 dB(A) increase over existing noise levels and then apply the substantial noise increase uniformly and consistently. Any predicted increase at or above the substantial increase limit selected by the state in their policy results in a noise impact. A substantial increase impact is not limited by the absolute noise level.



### **F3. Can noise analysts use the TNM contours function to determine impacts or analyze abatement considerations?**

Contours may not be used to determine impacts or for abatement consideration. As defined in 772.9(c), noise contour lines may be used for project alternative screening or for land use planning to comply with §772.17 of this part, but shall not be used for determining highway traffic noise impacts.

### **F4. What noise barrier standards are required?**

There are no Federal requirements or FHWA regulations related to the selection of material types used in the construction of highway traffic noise barriers. Individual state highway agencies select the material types they allow contractors to use when building these barriers, as well as the testing procedures required to evaluate barriers and construction materials. The state DOTs normally make this selection based on a number of factors such as aesthetics, durability and maintenance, cost, public comments, seismic or wind considerations, etc. Discussion of the process for evaluating noise barrier products designed and manufactured privately before installation, including testing such as susceptibility to shatter, flame spread, material strength, etc., can be found in Chapter 10 of the [Noise Barrier Design Handbook](#).

## **G. Noise Abatement**

### **G1. Are states required to provide abatement when the analysis identifies noise impacts resulting from the project?**

The state must consider abatement measures when the analysis identifies highway noise impacts in the design year and must implement noise abatement determined feasible and reasonable.

### **G2. What is "feasible" highway traffic noise abatement?**

Feasibility deals primarily with objective engineering considerations (e.g., can a barrier be built given the topography of the location; can a substantial noise reduction be achieved given certain access, drainage, safety, or maintenance requirements; are other noise sources present in the area, etc.). The preliminary and final project design should address safety, maintenance, and drainage concerns for all noise abatement measures. These issues should be part of the feasibility determination and can usually be resolved using good design practices. Also, noise barriers must be acoustically feasible. The minimal substantial reduction allowed is 5 dB(A). States define the number of impacted receptors that must achieve a 5 dB(A) reduction. A State must then apply these standards uniformly and consistently statewide.

### **G3. What is "reasonable" highway traffic noise abatement?**

Reasonableness considers three required criteria:

- Cost per benefited receptor
- Meeting the noise reduction design goal

- The outcome of a solicitation of viewpoints of benefited owners and residents

States may also use optional criteria as part of the assessment of reasonableness as shown in 23CFR772.13(d)(2)(v). The criteria used for determining reasonableness indicate a broad consideration of conditions that apply in a given location.

Highway Agencies consider the cost of abatement per benefited receptor using cost estimates based on historical construction costs for abatement. States that do not have a recent history of abatement construction may use regional or national trends as shown in the FHWA noise barrier inventory data available at [http://www.fhwa.dot.gov/environment/noise/noise\\_barriers/inventory/](http://www.fhwa.dot.gov/environment/noise/noise_barriers/inventory/) instead of historical costs. Some States allow for a quantity of noise barrier per benefited receptor rather than using a cost per benefited receptor.

Reasonable abatement must also achieve a noise reduction design goal for benefited receptors as defined in the state noise policy. The highway agency chooses the design goal in a range of 7-10 dB(A) and a number of benefited receptors that must receive a reduction equal to or greater than the agency design goal to meet this reasonableness criterion. Any receptor that meets or exceeds the design goal counts toward satisfying the noise reduction design goal of the reasonableness criterion.

Highway agencies must determine the desires of the benefiting residents and property owners. The FHWA-approved noise policy for each State outlines the procedure used to make this determination, but this process generally involves surveying the affected residents.

#### **G4. What types of abatement measures are eligible for Federal-aid funding?**

There are several alternative abatement measures allowed for use of Federal-aid funds. The noise analysis must at a minimum consider abatement in the form of a noise barrier and consider other measures where they are applicable. These alternative abatement measures are:

1. Traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations).
2. Alteration of horizontal and vertical alignments.
3. Construction of noise barriers, including acquisition of property rights, either within or outside the highway right of way. Landscaping is not a viable noise abatement measure.
4. 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. This measure may be included in Type I projects only.
5. Noise insulation of Category D land uses. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

#### **G5. Can states use quieter pavement as abatement?**

States cannot use quieter pavement for noise abatement. This does not preclude a State DOT from using quieter pavement as abatement on non-Federal-aid projects. States may also use quieter pavement on Federal-aid projects without classifying the pavement as a noise abatement measure.

**G6. Does vegetation reduce noise levels?**

States may not use vegetation for noise abatement, for projects subject to the provisions of 23 CFR 772. The FHWA takes this approach because studies have shown that vegetation must be a minimum of 100 feet thick, a minimum of 20 feet high and sufficiently dense (100% opacity) to provide a 5dBA noise reduction. However, vegetation may serve as a good visual screen for locations where abatement is not feasible or reasonable. States may use Federal-aid funds for vegetation near barriers or for landscaping near roadsides for aesthetic and visual purposes, but landscaping is not noise abatement.

**G7. Whom does the state DOT survey to obtain viewpoints?**

FHWA highway traffic noise regulation requires consideration of the viewpoints of the impacted residents and property owners in determining the reasonableness of the abatement. Highway agencies should engage in robust and meaningful outreach in order to solicit the viewpoint of all benefited receptors and obtain enough responses on which to base their decision. Decision makers should also consider a commercial establishment's preference to maintain visibility, but the primary consideration is to provide abatement.

There are different ways for highway agencies to conduct public outreach to solicit active public input, i.e. public meetings, surveys, mailings, community group meetings, etc. In order to obtain a majority of responses on which to base their decision, highway agencies should only consider votes that are submitted, and should not assume a "no response" is a vote for or against the noise abatement. The overall intent of this policy is to ensure that impacted residents and property owners have an open and fair opportunity to decide whether or not they want noise abatement.

**G8. When should the solicitation of viewpoints occur to satisfy the requirement in 23 CFR 772.13(d)(2)(i)?**

The solicitation of viewpoints should occur following approval of the final noise abatement design. The statement of likelihood should include a disclosure that the solicitation of viewpoints will occur during the completion of the project's final design and the public involvement processes, as stated in 23 CFR 772.13(g)(3).

**G9. What is the process for analyzing multi-family dwellings for impacts and consideration of abatement?**

The analysis must include all noise sensitive receptors, including multi-family dwellings for determination of noise impacts and consideration of abatement where impacts occur. The regulation requires consideration of each residence in a multi-family dwelling unit. The measurement location should be at areas of frequent human outdoor use. At times, it is difficult to determine areas of frequent human use, which may require a site visit. There may be locations where residents use balconies and patios making those locations the area of frequent human use. Other times there will be a communal outdoor area of frequent human use, such as a grill area, picnic tables, or playground. These are also good locations to take noise measurements as part of the noise study.

**G10. When only one side of the highway has a noise barrier, does the noise level increase for the opposite side of the highway where there is no noise barrier?**

Construction of a noise barrier on the opposite side of the highway from a receptor without a barrier should not result in a substantial increase in highway noise levels. If both the direct noise levels and the reflected noise levels are not abated by natural or artificial terrain features, the noise increase is theoretically limited to 3 dB(A) due to a doubling of energy from the noise source. In practice, however, not all of the acoustical energy reflects back to the receiver. The barrier diffracts some of the energy over the barrier, some energy is reflected to points other than the receiver, some is scattered by ground coverings (e.g., grass and shrubs), and some is blocked by the vehicles on the highway. Additionally, some of the reflected energy to the receiver is lost due to the longer path that it must travel. Attempts to measure this reflective increase rarely show an increase of greater than 1-2 dB(A).

**G11. Why are some communities eligible for noise abatement while others are not?**

The regulation requires consideration for feasible and reasonable noise abatement, typically a barrier, at locations where the noise analysis identifies impacts in the design year. Feasibility determinations deal with engineering considerations such as whether it is possible to build the barrier given the site constraints and whether the barrier achieves a 5 dB(A) or greater reduction in predicted noise levels for impacted receptors.

Reasonableness determinations consider the social, economic, and environmental factors of abatement. States consider, at a minimum, the cost of abatement, the ability of the abatement measure to meet or exceed the state's noise reduction design goal, and the views of the owners and residents of receptors predicted to benefit from an abatement measure. States may also consider alternative reasonableness factors, such as the predicted increase in noise level, the predicted absolute noise level, and the length of exposure to high noise levels among others. States have flexibility in the decision-making process and in defining their reasonableness factors. If a barrier is determined not to be feasible, it is usually due to either engineering or acoustic feasibility considerations. When abatement is determined not reasonable, it is because the cost exceeds cost reasonableness allowance, the residents did not desire abatement, or it was not possible to achieve a design that met the noise reduction design goal. Other reasonableness factors could have contributed to a determination that a barrier is not reasonable. The value of the properties considered for noise abatement is not an acceptable reasonableness criterion. The

FHWA will not participate in funding of noise abatement determined not to be feasible or reasonable.