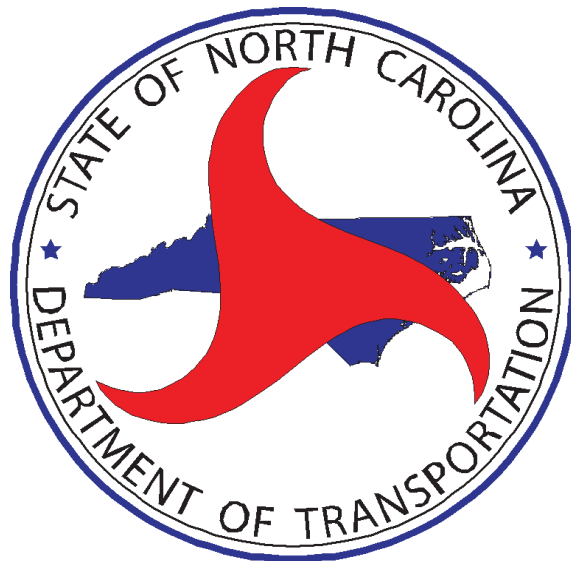


**NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
TRAFFIC NOISE ABATEMENT POLICY**



Effective Date: July 13, 2011


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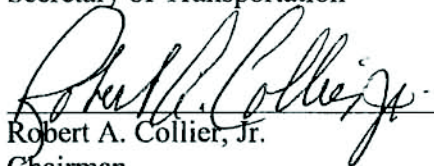
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2/28/2011
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INTRODUCTION

This document contains the North Carolina Department of Transportation (hereinafter NCDOT) policy on highway traffic noise and construction noise and describes the implementation of the requirements of the Federal Highway Administration (hereinafter FHWA) Noise Standard at 23 Code of Federal Regulations (CFR) Part 772 as they relate to federal and state funded highway construction in North Carolina. This policy was developed by the NCDOT and reviewed and approved by the FHWA.

The North Carolina Department of Transportation Traffic Noise Analysis and Abatement Guidance Manual and 23 CFR 772 are intended to be companion documents to this policy.

PURPOSE

This policy describes the NCDOT process that is used in determining traffic noise impacts and abatement measures and the equitable and cost-effective expenditure of public funds for traffic noise abatement. Where the FHWA has given highway agencies flexibility in implementing the 23 CFR 772 standards, this policy describes the NCDOT approach to implementation.

APPLICABILITY

This policy applies to all "Type I" federal, state or federal-aid highway projects in the State of North Carolina, including federal projects that are administered by local public agencies. NCDOT does not participate in nor fund Type II (retrofit) projects along existing state transportation facilities. Noise analyses are not required for Type III projects. Each of these project types are defined below. This policy shall be applied uniformly and consistently to all Type I federal projects throughout the state.

Type I Project

- (a) The construction of a highway on new location; or,
- (b) 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; or,
 - (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,
- (c) 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,

- (d) The addition of an auxiliary lane, except for when the auxiliary lane is a turn lane; or,
- (e) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,
- (f) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
- (g) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.
- (h) 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.

Type II Project.

A Federal or Federal-aid highway project for noise abatement on an existing highway. For a Type II project to be eligible for Federal-aid funding, the highway agency must develop and implement a Type II program in accordance with section 772.7(e).

Type III Project

A Federal or Federal-aid highway project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis.

The highway traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials in 23 CFR 772 and this policy constitute the noise standards mandated by 23 U.S.C. 109(1). All highway projects which are developed in conformance with this policy shall be deemed to be in accordance with the FHWA noise standards.

Projects let for construction on or after July 13, 2011 shall be reviewed under the criteria of this policy; however, the original date of public knowledge shall remain unchanged.

DATE OF PUBLIC KNOWLEDGE

The Date of Public Knowledge of the location and potential noise impacts of a proposed highway project is the approval date of the final environmental document, e.g., Categorical Exclusion (CE), State or Federal Finding of No Significant Impact (FONSI) or State or Federal Record of Decision (ROD).

After this date, the federal and state governments are no longer responsible for providing noise abatement measures for new development within the noise impact area of the proposed highway project. It is the responsibility of local governments and private landowners to ensure that noise-compatible designs are used for development permitted after the Date of Public Knowledge.

This policy applies only to developed land and to undeveloped land for which development is permitted before the project Date of Public Knowledge. The criteria (trigger date) for determining when undeveloped land is permitted for development is the approval date of a building permit for an individual lot or site.

TRAFFIC NOISE PREDICTION

All traffic noise analyses performed by or for NCDOT must utilize the most current version of the FHWA Traffic Noise Model (TNM®) or any other model determined by the FHWA to be consistent with the methodology of the TNM® model, pursuant to 23 CFR 772.9.

Average pavement type shall be used in the FHWA TNM® for future noise level prediction.

Noise contour lines may be used for project alternative screening or for land use planning, but shall not be used for determining highway traffic noise impacts.

Traffic characteristics that would yield the loudest hourly equivalent traffic noise levels for the design year shall be used in predicting noise levels and assessing noise impacts.

Traffic noise prediction must adhere to all methodologies detailed in the NCDOT Traffic Noise Analysis and Abatement Guidance Manual.

NOISE IMPACT DETERMINATION

Traffic noise abatement for NCDOT highway projects is warranted and must be considered when traffic noise impacts are created by either of the following two conditions:

- (a) The predicted traffic noise levels for the Design Year approach (reach one decibel less than) or exceed the Noise Abatement Criteria (NAC) contained in 23 CFR 772 and in Table 1, found on page 4 of this policy, OR
- (b) The predicted traffic noise levels for the Design Year substantially exceed existing noise levels as defined in Table 2, found on page 5 of this policy.

A receptor is a discrete or representative location of a noise sensitive area(s) for any of the land uses listed in Table 1. For multifamily dwellings, each residence shall be counted as one receptor when determining impacted and benefited receptors.

Primary consideration shall be given to exterior areas where frequent human use occurs in the determination of traffic noise impacts.

A traffic noise analysis shall be completed for each project alternative under detailed study and for each Activity Category listed in Table 1 that is present in the study area.

Table 1			
Noise Abatement Criteria			
Hourly Equivalent A-Weighted Sound Level (decibels (dB(A)))			
Activity Category	Activity Criteria¹ Leq(h)²	Evaluation Location	Activity Description
A	57	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 ³	67	Exterior	Residential
C ³	67	Exterior	Active sport areas, amphitheaters, 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	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 ³	72	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.

Table 2	
Substantial Noise Level Increase	
Hourly Equivalent A-Weighted Sound Level (decibels (dB(A)))	
Existing Noise Level ¹ (Leq(h))	Predicted Design Year Noise Level Increase ² (Leq(h))
50 or less	15 or more
51	14 or more
52	13 or more
53	12 or more
54	11 or more
55 or more	10 or more

¹ Loudest hourly equivalent noise level from the combination of natural and mechanical sources and human activity usually present in a particular area.
² Predicted hourly equivalent Design Year traffic noise level minus existing noise level.

ANALYSIS OF NOISE ABATEMENT MEASURES

When traffic noise impacts are identified and noise abatement is warranted, noise abatement measures shall be considered and evaluated for feasibility and reasonableness. All of the following conditions must be met in order for noise abatement to be justified and incorporated into project design, as applicable. Failure to achieve any single element of feasibility or reasonableness will result in the noise abatement measure being deemed not feasible or not reasonable, whichever applies.

Feasibility

The combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.

- (a) Any receptor that receives a minimum noise level reduction of five dB(A) due to noise abatement measures shall be considered a benefited receptor. Noise reduction of five dB(A) must be achieved for at least one impacted receptor.
- (b) Engineering feasibility of the noise abatement measure(s) shall consider adverse impacts created by or upon property access, drainage, topography, utilities, safety, and maintenance requirements.

Reasonableness

The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.

- (a) Viewpoints of the property owners and residents of all benefited receptors shall be solicited. One owner ballot and one resident ballot shall be solicited for each benefited receptor. Points per ballot shall be distributed in the following weighted manner:
 - 3 points/ballot for benefited front row property owners
 - 1 point/ballot for all other benefited property owners
 - 1 point/ballot vote for all residents

Consideration of the noise abatement measure will continue unless a simple majority of all distributed points are returned that indicates the balloted voters do not want the abatement measure.

- (b) The maximum allowable base quantity of noise walls and/or earthen berms per benefited receptor shall not exceed 2,500 ft² and 7,000 yd³, respectively. Additionally, an incremental increase of 35 ft² for noise walls and 100 yd³ for earthen berms shall be added to the base quantity per the average increase in dB(A) between existing and predicted exterior noise levels of all impacted receptors within each noise sensitive area, which is defined as a group of receptors that are exposed to similar noise sources. A base dollar value of \$37,500 plus an incremental increase of \$525 (as defined above) shall be used to determine reasonableness of buffer zones and noise insulation.
- (c) A noise reduction design goal of at least 7 dB(A) must be evaluated for all front row receptors. At least one benefited front row receptor must achieve the noise reduction design goal of 7 dB(A) to indicate the noise abatement measure effectively reduces traffic noise.

Other Considerations

Prior to CE approval or issuance of a FONSI or ROD, NCDOT shall identify in environmental documents:

- (a) Noise abatement measures that are feasible and reasonable,
- (b) Noise impacts for which no abatement appears to be feasible and reasonable;
- (c) Locations where noise impacts will occur, where noise abatement is feasible and reasonable, and the locations that have no feasible and reasonable abatement.
- (d) Whether it is “likely” or “unlikely” that noise abatement measures will be installed for each noise sensitive area identified. "Likely" does not mean a firm commitment. The final decision on the installation of the abatement measures shall be made upon

completion of the project design, the public involvement process, concurrence with the NCDOT Policy, and FHWA approval.

Acceptable Noise Abatement Measures

The following noise abatement measures may be considered for incorporation into a project to reduce traffic noise impacts.

- (a) Construction of noise barriers
- (b) Traffic management measures
- (c) Alteration of horizontal and vertical alignments
- (d) Establishment of buffer zones
- (e) Noise insulation of Activity Category D land use facilities listed in Table 1 on Page 4 of this policy.

Third Party Participation

- (a) Third party funding of noise abatement measures cannot be used to make up the difference between the reasonable base quantity allowance and the actual quantity of noise abatement. Third party funding is allowed only by public entities, and can only be used to pay for additional features such as landscaping and aesthetic treatments for noise barriers that meet cost-effectiveness criteria.
- (b) Traditional highway construction resources pay for required noise abatement measures. Should a local government request that materials be used that are more costly than those proposed by NCDOT, the requesting entity must assume 100% of the actual additional construction cost.
- (c) If a local government insists on the provision of a noise abatement measure deemed not reasonable by NCDOT, an abatement measure may be installed provided the local government assumes 100% of the costs and obtains an encroachment permit from NCDOT to perform the work. These costs include, but are not limited to, preliminary engineering, actual construction and maintenance. In addition, local governments must ensure that NCDOT's material, design and construction specifications are met. The local government must also assume 100% of the liability associated with the measure and hold harmless the NCDOT.
- (d) For (b) and (c) above, the settlement agreement shall be signed before third party noise abatement design begins and payment shall be made to NCDOT before project construction begins.

Quantity Averaging

NCDOT will utilize abatement measure quantity averaging among all noise sensitive areas within the same Activity Category in Table 1 that are exposed to a common noise environment, i.e., similar noise sources and levels, traffic volumes, traffic mix, speed and topographic features, if:

- (a) No single common noise environment exceeds two times the base quantity reasonableness criteria (e.g., two times 2,500 square feet, or two times 7,000 cubic yards); and,
- (b) Collectively, all common noise environments being averaged do not exceed the base quantity reasonableness criteria.

PUBLIC INVOLVEMENT

Communication with the community regarding noise impacts and possible noise abatement shall occur at the start of the noise study process and continue throughout the development of the project. NCDOT will communicate with citizens to present information on the nature of highway traffic noise and discuss the effects of noise abatement measures in attenuating traffic noise and the types of noise abatement measures that may be considered. The concerns of the community shall be a major consideration in reaching a decision on the abatement measures to be provided.

COORDINATION WITH LOCAL OFFICIALS

NCDOT will provide all traffic noise analyses to local government officials within whose jurisdiction a highway project is proposed as early in the project planning process as possible to protect future development from becoming incompatible with traffic noise levels. Specifically, environmental documents and design noise reports will contain information identifying areas that may be impacted by traffic noise, predicted noise level contour information, the best estimation of future noise levels for developed and undeveloped lands or properties in the immediate vicinity of the project and other appropriate design information. If requested, NCDOT will assist local officials with coordination and distribution of this information to residents, property owners and developers. NCDOT will provide assistance to local jurisdictions in the development of local noise controls, when requested. NCDOT will advocate the planning, design and construction of noise-compatible development and encourage its practice among planners, building officials, developers and others.

All noise-sensitive areas and any known noise abatement measures will be presented and discussed at the Design Public Hearing and Design Public Meetings.

CONSTRUCTION NOISE

To minimize the impacts of construction noise on the public, NCDOT shall:

- (a) Identify land uses or activities that may be affected by noise from construction of the project.
- (b) Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall consider the benefits achieved and the overall adverse social, economic, and environmental effects and costs of the abatement measures.
- (c) Consider construction techniques and scheduling to reduce construction noise impacts to nearby receptors and incorporate the needed abatement measures in the project plans and specifications.

FEDERAL PARTICIPATION

The costs of noise abatement measures may be included in federal-aid participating project costs with the federal share being the same as that for the system on which the project is located when:

- (a) Traffic noise impacts have been identified; and
- (b) Abatement measures have been determined to be feasible and reasonable pursuant to 23 CFR 772 and this policy.

REVIEW OF POLICY

This policy shall be reviewed by the NCDOT Board of Transportation at least every five years.