

Arizona Department of Transportation

Instructions on Land Use Category Determination and Approach Considerations

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INTRODUCTION

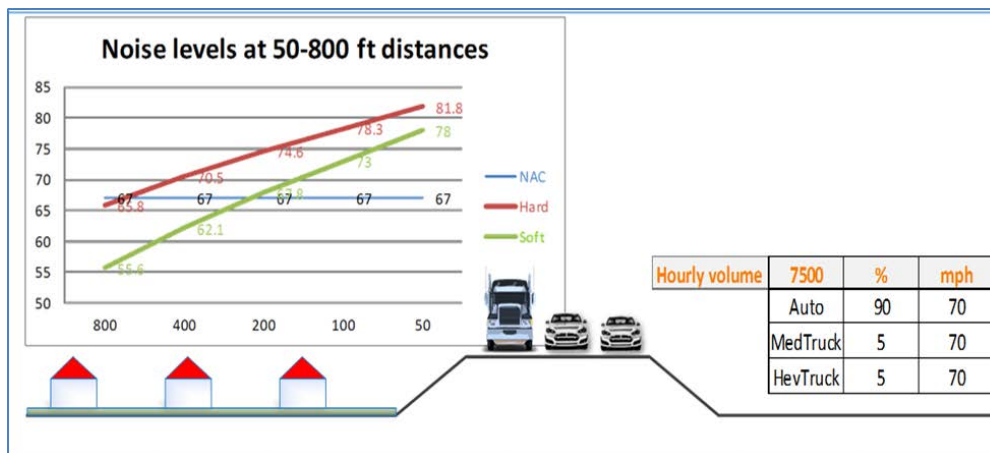
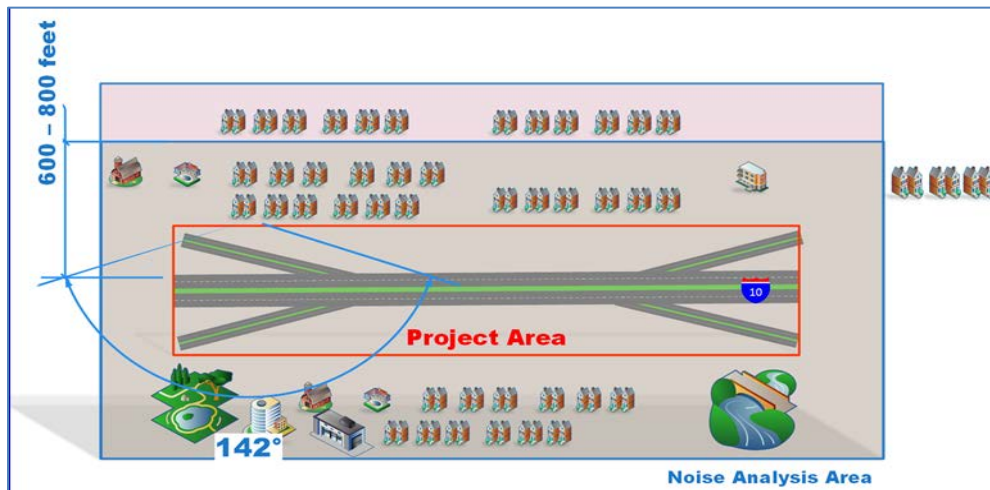
Land use determination is the second phase in noise analysis; it is preceded by the phase Type I project determination and is of fundamental importance for determining

- If there is a requirement for furtherance of Noise analysis
- The Extent and Comprehensiveness of the Noise analysis, and after eventual impact determination,
- The Feasibility and Reasonableness of the Noise abatement measures

For the purpose of noise analysis, land use determination should be extended beyond the project area to identify potential impacts from the project in question.

The most important factors in that determination are:

- Vehicle volumes and mix (AADT and % heavy trucks for example)
- Speed (50-65 mph or above)
- Distance between closest Receptor and roadway.



CLARIFICATION ON PERMITTED LAND USE STATUS

Although Activity Categories are clearly defined in the [Table 1 to Part 772—Noise Abatement Criteria](#), one area that particularly requires additional attention is the definition of the *permitted* when considering undeveloped land.

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, and it does not mean "*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.

Particular to the Arizona, both references that were provided used permitted and undeveloped as the descriptors, do not adequately address "partially developed and expired permit". Such ambiguity, not clarified and addressed thoroughly, may lead to significant, and unnecessary, financial ramifications.

To avoid such a situation, the following steps are to be followed.

1. *Identify Undeveloped Land.*
 - a. *If not, no furtherance is required.*
2. *Identify local jurisdiction responsible for that particular location, and the office responsible.*
 - a. *A first step resource may be [Arizona Records and Deeds](#).*
3. *From the jurisdiction, obtain the status of permit of the undeveloped land in writing (email, letter) , including the eventual expiry date*
 - a. *For example,*
 - [Phoenix](#), *"Permits shall expire 24 months from the date of permit issuance, if the work authorized by such permit is not started within 180 days from the date of permit issuance, or if work is suspended or abandoned for a period of 180 days"*
 - [Pinal County](#), *"Permits issued will expire within 180 days after issuance if no inspection has been performed. If the work is suspended or abandoned for a period of 180 days after the last inspection, the permit is considered expired.*
 - In [City of Glendale](#), *"Your building permit will remain valid for six months from the date of issuance. Once you start work, and pass your first inspection, your permit will remain valid as long as you continue to work, and call for inspections. If you stop work for more **than six months**, your permit will expire. "*

4. *If the permit is active, include the land in the noise analysis for the appropriate and permitted Activity Category to identify eventual impacts, as per ADOT Noise Abatement Requirement. If the noise analysis determines impact, include the land appropriately in noise abatement measures feasibility and reasonableness determination, as per ADOT NAR. Document the land use information in the pertaining section of the Noise Analysis Report and appropriate environmental documents.*
5. *If the permit is inactive or expired, include the land in the noise analysis and provide the noise contour information in line with Sections 2.6 Activity Categories and 8.3 Noise Compatible Land Use Planning of the ADOT NAR. Document the land use information in the pertaining section of the Noise Analysis Report and appropriate environmental documents.*
6. *No subsequent changes (beyond CE, ROD, FONSI) to the land permit status are to be considered. The date of approval of the Categorical Exclusion (CE), the Finding of No Significant Impact (FONSI) or the Record of Decision (ROD), as defined in 23 CFR 771. For state-funded projects, the Date of Public Knowledge is the date of approval of the appropriate environmental document.*

Relationship of Date of Public Knowledge and Date Permitted		
Activity	Scenario 1	Scenario 2
FEIS Completed	Last Week	Last Week
Building Permit Issued to Developer	Today	Today
ROD Issued	Yesterday	Next Week
Can Federal Participation be Considered?	No	Yes
Why or Why Not?	Development was permitted AFTER Date of Public Knowledge	Development was permitted BEFORE Date of Public Knowledge

EXAMPLE:

(A developer started a housing development on a location that is adjoining to a proposed highway project before an eventual fluctuation of financial environment, such as a housing market crash, or loss of financial ability to continue with the development resulting in the developer abandoning the project.)

The land was partially developed (i.e. underground utilities were installed, future roads were roughed in, and the future lots were graded).

However, the housing market crash, or any other consequentially similar situation, hits the developer, who never actually built any homes and the permit subsequently expired, while the highway project continues as phased.

It is not correct to assume the land would be used for its intended use, which was visually apparent, and incorporate a sound wall into the design at the location.

During construction is where the issue may come to a head, as FHWA may not participate in the cost of the wall due to the fact that the development currently was not permitted, even though a permit had been pulled and subsequently expired as described above.

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. FHWA approval is required prior to including a specific property as Category A in noise analysis.

Activity Category A land uses have a lower noise impact level at or higher than 56 dBA, as defined by AOT NAR – Chapter 3. If there is only a specific site of the property that meets criteria for Activity Category A, only that site is to be considered as Activity Category A, whereas other portions of the property are to be considered as applicable Activity Category. A modeled receiver assigned to the site is to represent Receptors calculated as an average hourly number of visitors present divided by 8.

Steps to follow in determining if the site in question may be considered for Activity Category A:

1. Identify property with a potential serene and quiet site (one may want to consult 23 CFR 774)
 - a. If a site is identified in other environmental documents as Section 4f or Section 106, it may be a good indicator to a noise analyst
2. Determine if the site is frequently used or is available for use by the public, while serving its primary intended purpose, and is likely to maintain its historical, religious, cultural, or natural significance in Design Year.
 - a. It is important to determine if there is a secondary intended purpose that may not require serene and quiet. In such an occurrence the site may not be eligible for Category A determination
3. Determine if the preservation of serenity and quiet is and is likely to be essential to serve the site's primary intended purpose in Design Year.
4. Determine and document Existing noise levels at the site, following the *Instruction on Determination on Existing Noise levels and Noise Measurement Data Form*

- a. If the Existing noise levels are less than 56 dBA, include the site as Category A in the analysis; otherwise consider the site and the respective property in line with Section 2.6 of ADOT NAR.
5. For predicting Design Year noise levels, determine the number of Receptors represented by the modeled receiver, by taking the average number of visitors, including consideration of eventual capacity restriction for the site, and that number dividing by 8.
6. All and any determination, including impact and meeting noise abatement measure feasibility and reasonableness criteria, is to be properly documented in accordance with the ADOT NAR.

ACTIVITY CATEGORY B LAND USE

Activity Category B includes single and multi-family residences. Every unit in multi-family residence is to be represented as a Receptor. Residential hotels and motels that function as apartment dwellings should also be treated as Category B. The receivers representing these facilities are to be placed at 5 ft, and 17 ft for the rooms at 2nd level.

ACTIVITY CATEGORY C LAND USE

As per [Table 1 to Part 772](#), Activity Category C includes active sport areas, amphitheaters, 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. For a medical facility to be considered in noise analysis under Category C, that facility must be an inpatient medical facility where medical treatment and care occurs. ADOT NAR Section 2.7 provides guidelines how to represent these facilities:

“a) The receivers representing facilities such as a school or a hospital building are to be placed on each of the corners of the building and in the middle of the longer side of the building closest to the highway at 5 ft, and 17 ft for the rooms at 2nd level. Number of represented Receptors is to be equally distributed between the representing receivers. The total number of Receptors assigned to the building is calculated by dividing the total number of occupants by 8.

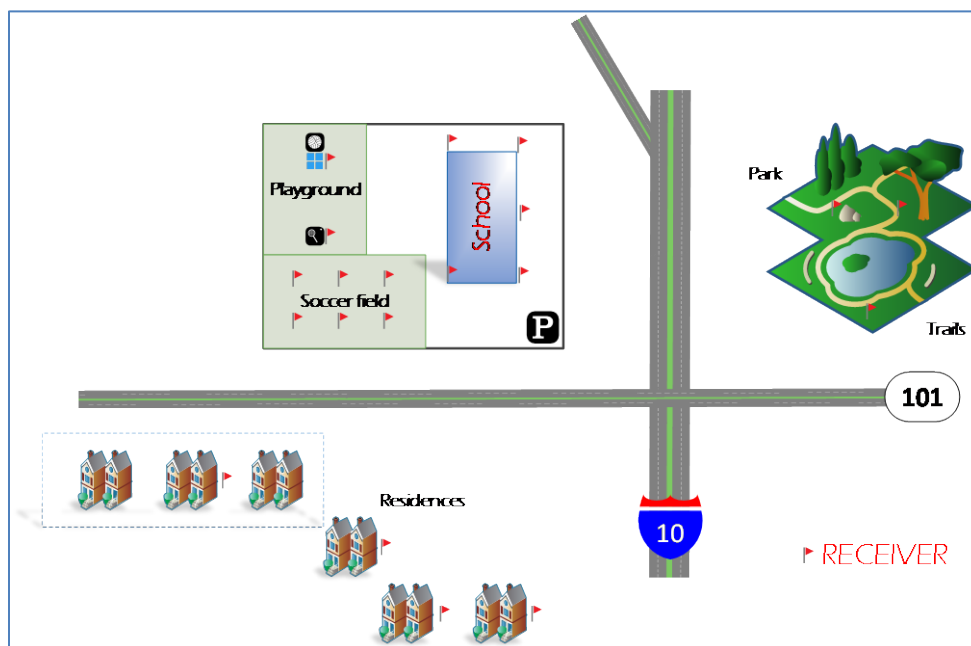
b) For other non-residential areas such as many of the Category C, D, and E locations listed in where the number of Receptors is not easily defined, the number and placement of receivers should consider the size of the area as well as the amount and intensity of use, as follows:

1) Determine the base number of Receptors in the area: divide the total land area of the receiver by 7,500 sqft, roughly the average size of a residential lot in Arizona.

2) Considering the intensity of use, assign one of the following values to each activity area:

- 0.5 – Low Intensity Area. A part of an area that receives limited use, or which is used primarily during non-peak traffic hours. Possible Examples: A general use section of a park, an overflow section of a camping ground, etc.
- 1 – Moderate Intensity Area. A part of an area that receives use comparable to a standard residence. Possible Examples: a small youth activity center, a designated picnic area, etc.
- 2 – High Intensity Area. An area which is used by either a moderate amount of people constantly or by a large number of people at one time. Possible Examples: a community center or swimming pool, a busy playground, or a courtyard.

Multiply the number of receivers from 1) by the intensity of use determined in 2), and place those receivers where the activity is most likely to occur. If this can't be determined, then the receivers should be distributed evenly across the area, or in a case of a track every 200 ft.



Example: A city park is located next to the transportation facility, and consists of an area 1000' long by 500' wide. It contains a youth swimming area (30,000 sqft, High Intensity), a picnic area (75,000 sqft, Moderate Intensity) and a Soccer Field (90,000 sqft, Moderate Intensity); the remaining 305,000 sqft of general use area is considered to be Low Intensity. The youth swimming area will be assigned 8 Receptors (4 x 2), the picnic area and soccer field will be assigned 10 and 12 Receptors respectively, and the remaining area will have 21 (41 x 0.5) Receptors spread across it evenly. Similar approach is to be used for land-development areas, where a lot of approx. 7500 sqft is to be considered as a single family residential facility, unless other facility is stated in the land use documents."

CONSIDERATION OF SECTION 4(f) AND SECTION 106 LAND USE

For properties subject to Section 4(f) protection, impacts must be evaluated by FHWA on a case-by-case basis to determine if there is a “substantial impairment” to the intended use of the property, up until ADOT assumes NEPA - NEPA assignment MOU signed/effective date of program. Section 4(f) protections do not apply to state-funded projects.

To best describe the method of analysis when dealing with Section 4(f) and Section 106, one may use a “*bifocal*” approach, as illustrated below. Noise analyst should have the Noise Analysis “bifocal” glasses in this case, as impact verse adverse effects thresholds depend on the federal regulation applicability.



The main frame, 23 CFR 772, is predominant in determining eventual noise abatement measures (feasibility and reasonableness) consideration. Regulations [23 CFR 774.15](#) and [36 CFR 800.5](#) do not provide metrics to determine when a change in noise establishes an effect under the regulations. As per [FHWA FAQ](#), in both cases FHWA considers anything above 3 dBA to be a change that should be considered an effect.

Therefore, for the noise analysis, the required steps are:

1. Identify Section 4(f) and Section 106 site on the property
 - a. Noise analyst is not the person to make the assessment and it is normally done long before the noise analysis under regular flow of NEPA process
2. Determine the applicable FHWA Activity Category
 - a. C, in most circumstances
 - b. A, if the site is serene and quiet (as discussed in previous chapters for Category A), or
3. Determine Existing noise conditions following [Instruction on Determination on Existing Noise levels and Noise Measurement Data Form](#) and Chapter 2 - ADOT NAR – Analysis of Traffic Noise

4. Determine Predicted noise levels, as per Chapter 2 - ADOT NAR – Analysis of Traffic Noise
5. Identify if
 - a. There is a change in noise levels above 3 dBA as a result of the highway project.
 - b. There is impact, as per [23 CFR 772.5](#) definition of impact and Chapter 3 – ADOT NAR – Noise Abatement Criteria and Impact Determination, for the pertaining Activity Category.
 - c. If there is no change in noise levels above the 3 dBA, but the future predicted noise levels are at or higher than 66 dBA (for Activity Category C, or 56 dBA for Activity Category A) the property is considered as impacted, and noise abatement measures are to be considered, under the ADOT NAR.
6. Identify applicable mitigation, or noise abatement measures in line with the ADOT NAR (Chapter 4 - Analysis of Noise Abatement Measures, Chapter 5 - Feasibility, and Chapter 6 – Reasonableness)
7. All and any determination, including impact and meeting noise abatement measure feasibility and reasonableness criteria, is to be properly documented in accordance with the ADOT NAR.

ACTIVITY CATEGORY D LAND USE

Activity Category D includes non-residential facilities, such as auditoriums, day care centers, hospitals, libraries, medical facilities, and places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios. Noise abatement measure of interior locations at Category D land uses is considered where exterior abatement is not feasible or reasonable. Interior noise levels may be determined by measurements or by reduction factors applied to results obtained by TNM. Arizona weather may be considered as extreme and vast majority of these buildings may have the windows closed throughout the year, unless otherwise determined at methodology meeting. Therefore the initial noise reduction factor for consideration for this category is 20 dBA, which is characteristic for light-frame buildings with ordinary sash windows while closed.

ACTIVITY CATEGORY E LAND USE

Activity Category E is the exterior criteria for motels, hotels, offices and other developed lands not included in A-D or F. For the Receptors for this Activity Category, the determination is done in the same manner as for the multi-family residences, while the determination for the pools or outdoor use area of frequent occupancy, same philosophy applies as described earlier. Parts of the hotels and motels that are used as permanent residential facilities are to be considered as Activity Category B. All these determinations are to be done at the methodology meeting.