NOISE ANALYSIS - Flow chart

May 2025

Project Determination

Collect and Review Project Data (Scope, location, adjacent land)

Project adds capacity?
1. Is this a new highway on new location?
2. Does the project add capacity, by adding HOV lane, general-purpose lane, or auxiliary lane longer than 2500, except turn lane?

No

Substantial Horizontal Alteration?
3. Does it half the distance between roadway and noise sensitive land use categories (residences, schools, parks or other sensitive land uses)? This is considered a substantial horizontal alteration.

No

Substantial Vertical Alteration?
4. Does the project break the line-of-sight between roadway and noise sensitive area? If one can see a top of a truck looking from a location of noise receptors (5 ft above ground). Even landscaping or berm removal is considered.

Yes

No

If any answered YES
Noise sensitive
land use consideration
WARRANTED

Yes

Land Use Determination

Start review of land use area within approx 800 ft of roadway.

Are there residences?

Are there active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries?

Are there 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?

Is there an important site due to its historical, religious, cultural, or natural significance, with exterior human use (Section 4f, Section 106)?

Is there undeveloped land with active permit?

If any answered YES
Noise analysis
Traffic & Construction noise
WARRANTED

Yes

No

Are there known nesting sites within 1000 ft?

No

Yes

No need for noise analysis

Documenting the traffic and construction noise in relation to the project individually or cumulatively have **no significant** effect on the environment.

Consult with ADOT EP Noise staff for process.

Noise Impact Determination

Start process of **Impact Determination** for all land use categories after **Methodology meeting** with ADOT EP Noise

Perform sound level measurements at representative receptors during the "worst" noise hour

Identify and quantify alternate noise source such as other roadways/streets, railroads, industrial facilities, and airplane flight paths

Model highway traffic noise using FHWA-approved Traffic Noise Model (TNM)

Predict **Existing and Future (BUILD&NO BUILD)** noise levels using validated FHWA Traffic Noise Model for all sensitive land use categories

Traffic Noise Impact Determination

Traffic noise levels approach or exceed the noise abatement criteria?

Predicted future noise levels substantially exceed the existing noise level? (15 dBA)

Yes

Consideration of Noise Abatement Measures **REQUIRED**

No

No need for further noise analysis

Documenting the traffic and construction noise in relation to the project individually or cumulatively have **no significant** effect on the environment.

Noise Abatement Determination

Start process of identification and evaluation of **Noise Abatement Measures**

Identify location, height, and length of noise barrier(s) using validated FHWA TNM for all impacted receivers. Consider other measures as appropriate.

Evaluate Engineering Feasibility Factors

Not potential safety hazard?

Yes

Not higher than 24 ft?

Yes

Not require breaks in barrier diminishing its effectiveness, hinder access to properties, drainage, utilities and maintenance?

Yes

Meets Engineering Feasibility Requirements

Yes

Evaluate Acoustic Feasibility Factor

Achieves of at least a five dB(A) highway traffic noise reduction at 50 % of impacted Receptors?

Yes

Meets both Engineering and Acoustic Feasibility Requirement

Yes

No

No

No

No need for further noise analysis

Documenting the traffic and construction **noise impacts** in relation to the project on the environment are **identified**. Proposed Noise Abatement Measures **do not meet** Engineering, Acoustic, or Reasonableness criteria.

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Evaluate Reasonableness Criteria

Meets Noise Reduction Design Goal? (provides 7 dBA reduction for >50% of 1st row benefited Receptors)

Yes

Meets Cost Effectiveness Criteria? (<$49,000 per benefited Receptor)

Yes

Meets Property Owners Viewpoint Criteria? (no substantial opposition to building wall)

Yes

Meets Reasonableness Criteria

No

Noise Analysis Completed. Noise Abatement Measures identified and recommended

Documenting the traffic and construction **noise impacts** in relation to the project on the environment are **identified**. Proposed Noise Abatement Measures **collectively meet** Engineering, Acoustic, and Reasonableness criteria and are recommended.

Phase - Analyses

Phase – Findings & Decision

Phase – Documenting Findings & Decision