

Addendum to the Technical Memorandum “U.S. 287 at Lamar: Noise Analysis” dated July 2003.

PREPARED FOR: U.S. 287 at Lamar - CDOT Region 2

PREPARED BY: Caitlin McCusker/CH2M HILL

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Introduction

This addendum memorandum updates the Technical Memorandum “U.S. 287 at Lamar: Noise Analysis” dated July 2003. The data presented in this addendum memorandum updates the analysis and conclusions of the original noise analysis.

Regulatory Framework

The noise impact analysis conducted for this project followed the CDOT *Noise Analysis and Abatement Guidelines* (CDOT, 2011). These guidelines establish “noise abatement criteria (NAC),” which represent the maximum noise impact thresholds that various land uses can be exposed to before considering noise reduction or abatement measures. The NAC for different activity categories are shown in Table 1.

The method used to describe noise levels along highways is the equivalent level (L_{eq}), which is the average noise level over a given time period. The time period used for highway noise analysis is 1 hour. All noise levels described in this analysis are hourly L_{eq} .

CDOT guidelines require that noise mitigation must be considered for any receptor for which predicted traffic noise levels, using design-year (2035) traffic volumes and roadway conditions, meet or exceed the CDOT Noise Abatement Criteria (i.e., 66 decibels for Category B and C receptors) as shown in Table 1. The guidelines also state that noise mitigation must be considered for any receptors where predicted noise levels for design-year conditions increase by 10 decibels or more above existing levels.

TABLE 1
CDOT Noise Abatement Criteria

Activity Category	Leq ^{1,2} (decibels)	Description
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (Exterior)	Active sport areas, amphitheatres, auditoriums, campgrounds, cemeteries, daycare centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.

D	51 (Interior)	Auditoriums, daycare 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	71 (Exterior)	Hotels, motels, offices, restaurants, bars, and other developed lands, properties, or activities not included in A–D or F.
F	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---	Undeveloped lands that are not permitted.

¹Hourly A-weighted equivalent level for the noisiest hour of the day in the design year.

²CDOT noise impact analyses use "approach criteria," which are 1 decibel less than the FHWA L_{eq} values. Source: CDOT. 2011. *Noise Analysis and Abatement Guidelines*. March 23.

Methodology

The original noise analysis, completed in 2003, used the STAMINA noise software to predict noise levels for the project. Since then, the Traffic Noise Model version 2.5 (TNM 2.5) has replaced STAMINA as the approved software for noise analysis on federal highway projects.

The noise analysis for this project has been updated with existing traffic volumes (2011) and design year traffic volumes (2035). Peak hourly volumes for existing conditions were derived from the Average Annual Daily Traffic (AADT), made available through CDOT's Online Transportation Information System. These volumes replace the 2002 existing condition volumes that were utilized in the original noise analysis.

Peak hourly volumes for future No Build and Proposed Action conditions were developed for design year 2035. These volumes replace the 2025 design year volumes that were utilized in the original noise analysis.

Noise Results

Existing and No Build noise levels were both measured and predicted. Because the existing, gravel alternative truck route is located where there is little to no existing traffic, a long-term noise level measurement was taken to determine the existing noise levels (i.e., the model could not be used because there is not enough traffic there to model accurately). Noise levels for the Proposed Action were estimated using TNM 2.5 and results for all three scenarios are illustrated below in Table 2.

TABLE 2
Summary of Noise Results

Representative Receptors	NAC	Maximum Concentration			Change in dBA from Existing to Proposed
		Existing (2011) (dBA)	No Build (2035) (dBA)	Proposed Action (2035) (dBA)	
R1	B 66	67	68	57	-10
R2	B 66	65	66	58	-8
R3	B 66	57	57	59	2
R4	B 66	60	61	62	2

TABLE 2
Summary of Noise Results

Representative Receptors	NAC	Maximum Concentration			Change in dBA from Existing to Proposed
		Existing (2011) (dBA)	No Build (2035) (dBA)	Proposed Action (2035) (dBA)	
R5 Museum	C 66	61	62	65	3
R6	B 66	59	58	58	-1
R7	B 66	59	57	57	-1
R8	B 66	52	51	52	1
R9	B 66	50	49	55	5
R10	B 66	43	42	47	4
R11	B 66	60	58	58	-2
R12 Motel	E 71	61	61	64	4
R13 Motel	E 71	60	61	64	4
R14 Motel	E 71	59	59	62	3
R15 Motel	E 71	61	61	64	4
R16 Historic Depot	C 66	59	59	59	0
R17 Centennial Park	C 66	65	65	65	0
R18 High School	C 66	62	62	62	0
R19 Ball fields	C 66	55	57	56	1
R20 CommCollege	C 66	58	60	58	1
R21	B 66	54	55	55	1
R22	B 66	50	52	51	1
R23	B 66	50	51	54	5
R24	B 66	56	58	47	-10
R25	B 66	43	43	43	0
R26*	B 66	43	43	42	-1
R27*	B 66	43	43	42	-1
R28*	B 66	43	43	45	2
R29*	B 66	43	43	45	2
R30*	B 66	43	43	46	3
R31*	B 66	43	43	48	5
R32*	B 66	43	43	45	2
R33	B 66	56	57	48	-8
R34	B 66	56	58	47	-9
R35	B 66	50	51	48	-2
R36 Mobile Home Park	B 66	61	61	56	-5
R37	B 66	68	68	62	-5
R38	B 66	68	69	63	-5
R39 Motel	E 71	67	68	62	-5
R40	B 66	59	59	54	-5
R41	B 66	70	70	65	-5
R42	B 66	70	70	65	-5

TABLE 2
Summary of Noise Results

Representative Receptors	NAC	Maximum Concentration			Change in dBA from Existing to Proposed
		Existing (2011) (dBA)	No Build (2035) (dBA)	Proposed Action (2035) (dBA)	
R43	B 66	69	70	64	-5
R44	B 66	54	54	50	-4
R45	B 66	56	56	52	-4
R46 School	C 66	56	56	52	-4
R47	B 66	61	61	56	-5
R48	B 66	60	60	55	-4

Noted: **bolded** results indicate the NAC is exceeded.

*Field measurements are used to represent Existing and No Build noise levels at receptors R26-R32 instead of estimated TNM results because of the lack of traffic represented along the existing, gravel alternative truck route.

Existing Conditions (2011)

Noise levels would range from 43 dBA to 70 dBA under the No Build. The loudest noise levels would occur along U.S. 50 within the Lamar city limits, largely due to the high percentage of heavy truck traffic.

No Build (design year 2035)

Noise levels would range from 43 dBA to 70 dBA under the No Build. The loudest noise levels would occur along U.S. 50 within the Lamar city limits, largely due to the high percentage of heavy truck traffic.

Proposed Action (design year 2035)

Noise levels would range from 42 dBA to 65 dBA under the Proposed Action. The greatest increase in noise levels over the existing noise levels would be 5 dBA. None of the representative noise receptors in the project area would exceed the NAC or would experience a substantial increase in noise levels under the Proposed Action. Noise levels would decrease compared to the Existing noise levels where the roadway would shift away from noise receptors. Noise levels would decrease along U.S 50 in town as well as a result of the reliever route diverting heavy truck traffic away from downtown Lamar.

Mitigation of Proposed Action

Avoidance and Minimization. The Proposed Action is not anticipated to cause noise impacts; therefore no mitigation is proposed.

References

CDOT. 2011. *Noise Analysis and Abatement Guidelines*. March 23.