ALAMO RMA

Alamo Regional Mobility Authority

"Moving people faster"

Traffic Noise Technical Report

Blanco Road

From West Oak Estates Drive to Borgfeld Drive

CSJ: 0915-12-585

Bexar County, Texas

June 2018

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by TxDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated December 16, 2014, and executed by FHWA and TxDOT.

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1.0 INTRODUCTION

The Alamo Regional Mobility Authority (ARMA) proposes to improve a 3.6 mile segment of Blanco Road between West Oak Estates Drive and Borgfeld Drive in Bexar County from a two-lane roadway to a four-lane roadway with two 12-foot travel lanes and 6-foot shoulders/bike lanes in each direction. The roadway would have a raised median, and curb and sidewalk on the northbound side of the project. No additional right-of-way (ROW) is needed for the proposed improvements. The length of the proposed project is approximately 3.6 miles.

2.0 TRAFFIC NOISE ANALYSIS

This analysis was accomplished in accordance with TxDOT's (Federal Highway Administration [FHWA] approved) *Guidelines for Analysis and Abatement of Roadway Traffic Noise* (2011).

Sound from highway traffic is generated primarily from a vehicle's tires, engine and exhaust. It is commonly measured in decibels and is expressed as "dB."

Sound occurs over a wide range of frequencies. However, not all frequencies are detectable by the human ear; therefore, an adjustment is made to the high and low frequencies to approximate the way an average person hears traffic sounds. This adjustment is called A-weighting and is expressed as "dB(A)."

Also, because traffic sound levels are never constant due to the changing number, type and speed of vehicles, a single value is used to represent the average or equivalent sound level and is expressed as "Leq."

The traffic noise analysis process includes the following elements:

- Identification of land use activity areas that might be impacted by traffic noise.
- Determination of existing noise levels.
- Prediction of future noise levels.
- Identification of possible noise impacts.
- Consideration and evaluation of measures to reduce noise impacts.

The FHWA has established the following Noise Abatement Criteria (NAC), shown in **Table 1**, for various land use activity areas that are used as one of two means to determine when a traffic noise impact would occur.

Table 1: FHWA Noise Abatement Criteria (NAC)

Activity Category	FHWA dB(A) Leq	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	67 (exterior)	Residential.
C	67 (exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or non-profit 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	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.

A noise impact occurs when either the absolute or relative criterion is met:

Absolute criterion - the predicted noise level at the receiver approaches, equals, or exceeds the NAC. "Approach" is defined as one dB(A) below the NAC. For example, a noise impact would occur at a Category B residence if the noise level is predicted to be 66 dB(A) or above.

Relative criterion - the predicted noise level substantially exceeds the existing noise level at a receiver even though the predicted noise level does not approach, equal, or exceed the NAC. "Substantially exceeds" is defined as more than 10 dB(A). For example: a noise impact would occur at a Category B residence if the existing level is 54 dB(A) and the predicted level is 65 dB(A).

When a traffic noise impact occurs, noise abatement measures must be considered. A noise abatement measure is any positive action taken to reduce the impact of traffic noise on an activity area.

The FHWA traffic noise modeling software was used to calculate existing and predicted traffic noise levels. The model primarily considers the number, type, and speed of vehicles; highway alignment and grade; cuts, fills, and natural berms; surrounding terrain features; and the locations of activity areas likely to be impacted by the associated traffic noise.

Table 2 and **Appendix B** shows the 2021/2041 traffic data utilized in the Blanco Road traffic noise models, as provided by TxDOT's Transportation Planning and Programming Division (TPP). Since the traffic data provided by TPP was for the existing year 2021 and a design year of 2041, the annual growth rate (2021 to 2041) of the TPP approved traffic was determined. This annual growth rate (2.2 percent) was then applied to the 2021/2041 traffic data to determine existing/proposed traffic counts for 2018/2038. The resulting values for 2018/2038 were then used for this noise analysis.

Table 2: Traffic Noise Analysis Parameters

Roadway	Speed Limit	Average Annual Daily Traffic		Vehicle Distribution (%)			Directional Distribution
		2018	2038	Light Duty	Medium Duty	Heavy Duty	
Blanco Road from W. Oaks estate to Approx 4 miles North (North of Borgfeld Rd)	55 mph	7,203	11,148	95	3.6	1.4	64-36

Existing and predicted traffic noise levels were modeled at receiver locations (see **Table 3** and **Appendix A**) that represent the land use activity areas adjacent to the project area that might be impacted by traffic noise and might potentially benefit from feasible and reasonable noise abatement.

Table 3: Traffic Noise Levels [dB(A) Leq]

Receiver ID	Land Use	NAC Category	NAC Level	Predicted Traffic Noise Level [dB(A) Leq]			Noise Impact
				Existing (2017)	Predicted (2037)	Change (+/-)	
R1	Residential	B	67	55	57	+2	N
R2	Daycare (interior)	D	52	33	38	+5	N
R3	Residential	B	67	56	59	+3	N
R4	Residential	B	67	52	56	+4	N
R5	Residential	B	67	56	60	+4	N
R6	Residential	B	67	58	64	+6	N
R7	Residential	B	67	58	63	+5	N
R8	Residential	B	67	60	63	+3	N
R9	Residential	B	67	59	62	+3	N
R10	Residential	B	67	57	61	+4	N
R11	Residential	B	67	57	63	+6	N
R12	Residential	B	67	57	61	+4	N
R13	Residential	B	67	56	59	+3	N
R14	Residential	B	67	51	55	+4	N
R15	Residential	B	67	55	59	+4	N
R16	Residential	B	67	56	60	+4	N
R17	Residential	B	67	54	58	+4	N
R18	Residential	B	67	51	55	+4	N
R19	Residential	B	67	56	60	+4	N
R20	Park – Picnic Table	C	67	54	57	+3	N

3.0 NOISE ABATEMENT MEASURES

As indicated in **Table 3**, the proposed project would not result in a traffic noise impact; therefore, no noise abatement measures were considered for this project.

4.0 NOISE PLANNING

To avoid noise impacts that may result from future development of properties adjacent to the proposed project, local officials responsible for land use control programs must ensure, to the maximum extent possible, no new activities are planned or constructed along or within the following predicted (2037) noise impact contours (see **Table 4**).

Table 4: Traffic Noise Contours [dB(A) Leq]

Location	Distance from Proposed ROW	
	NAC Category B & C 66 dB(A)	NAC Category E 71 dB(A)
East side of Blanco Rd at Cowgill Rd	ROW	ROW
East side of Blanco Rd, 800 feet south of Slumber Pass	ROW	ROW

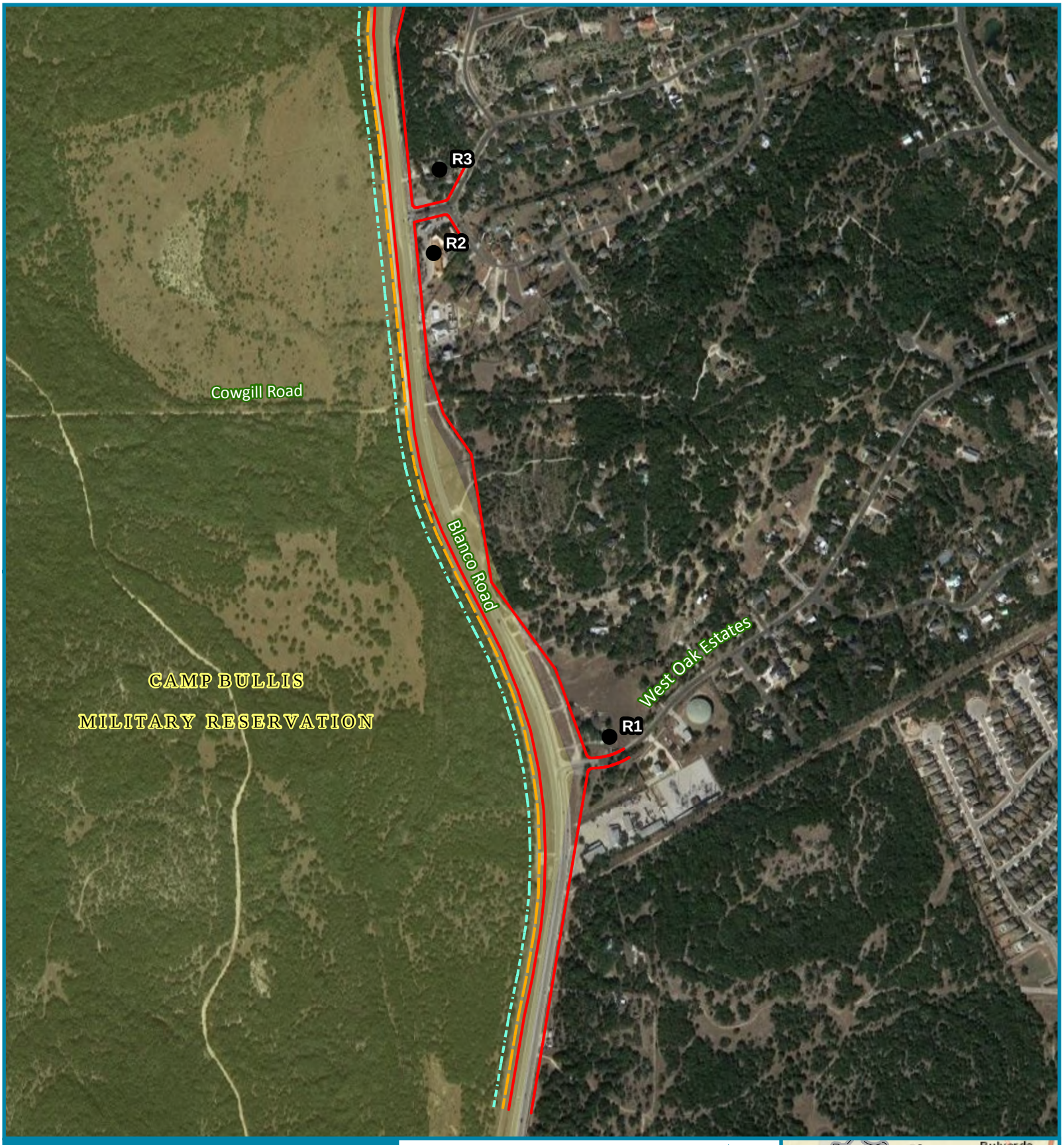
5.0 CONCLUSION

Based on this modeled noise analysis, there are no projected noise impacts within the corridor; therefore, no noise abatement measures were considered for this project. Noise associated with the construction of the proposed project is difficult to predict. Heavy machinery, the major source of noise in construction, is constantly moving in unpredictable patterns. However, construction normally occurs during daylight hours when occasional loud noises are more tolerable. None of the receivers are expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is expected. Provisions would be included in the plans and specifications that require the contractor to make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

A copy of this traffic noise analysis would be made available to local officials. On the date of approval of this document (Date of Public Knowledge), FHWA and TxDOT are no longer responsible for providing noise abatement for new development adjacent to the proposed project.

APPENDIX A

REPRESENTATIVE NOISE RECEIVERS EXHIBIT



Representative Receivers

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BC06 Blanco Road
Phase II

Blanco Road from West Oak Estates
to Borgfeld Drive, San Antonio
Bexar County, TX
CSJ 0915-12-585

Feet
0 600 1,200

NORTH

- Existing ROW
- Non-Impacted Receiver
- 66 dB(A) Contour
- 71 dB(A) Contour

Basemap: Esri World Street, Texas Google Imagery 2016

Representative Receivers

Page 2 of 3

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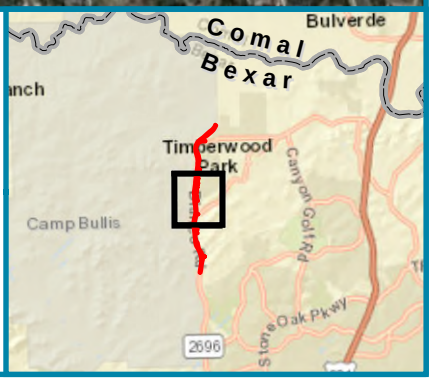

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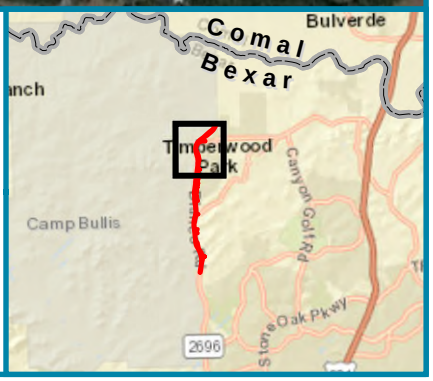

APPENDIX B

TRAFFIC DATA

Texas Department of Transportation

MEMO

June 2, 2017

To: Mario Jorge, P.E., District Engineer
Attention: Jonathan Bean, P.E., Director of TPD

Through: William E. Knowles, P.E.
Traffic Analysis Section Director, TPP

From: Bruce R. Uphaus
Planner, TPP

Subject: Traffic Data
CSJ: 0915-12-585
Blanco Road:
From W. Oaks Estate
To Approx. 4.0 Miles North (North Leg of Borgfeld Rd.)

Bexar County

Attached are tabulations showing traffic analysis for highway design for the 2021 to 2041 twenty year period and 2021 to 2051 thirty year period for the described limits of the route. Included is a tabulation showing data for use in air and noise analysis.

Please refer to your original memorandum dated April 27, 2017.

If you have any questions or need additional information, please contact Bruce R. Uphaus at (512) 486-5104.

Attachment

CC: Richard De La Cruz, P.E., Transportation Engineer, San Antonio District
Design Division

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

San Antonio District

June 1, 2017

Description of Location	Average Daily Traffic 2021	Average Daily Traffic 2041	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 20 Year Period (2021 to 2041) Flexible Pavement	S N	Rigid Pavement	SLAB
Blanco Road From W. Oaks Estate To Approx. 4.0 Miles North (North of Borgfeld Rd) Bexar County	7,700	11,900	64 - 36	12.8	6.7	5.0	10,900	30	1,401,000	3	1,610,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	93.3	95.0
Medium Duty	4.8	3.6
Heavy Duty	1.9	1.4

Description of Location	Average Daily Traffic 2021	Average Daily Traffic 2051	Base Year Dir Dist %	Base Year K Factor	Base Year Percent Trucks ADT	Base Year Percent Trucks DHV	ATHWLD	Percent Tandem Axles in ATHWLD	Total Number of Equivalent 18k Single Axle Load Applications One Direction Expected for a 30 Year Period (2021 to 2051) Flexible Pavement	S N	Rigid Pavement	SLAB
Blanco Road From W. Oaks Estate To Approx. 4.0 Miles North (North of Borgfeld Rd) Bexar County	7,700	13,100	64 - 36	12.8	6.7	5.0	10,900	30	2,230,000	3	2,562,000	8"