Noise Impact Analysis Technical Report

FM 2642 Widening from FM 35 to SH 66

CSJ: 2658-01-013

July 2019

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

This analysis was accomplished in accordance with TxDOT's Guidelines for Analysis and Abatement of Roadway Traffic Noise (2011), which is approved by the Federal Highway Administration (FHWA). 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 typically 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.

As shown in **Table 1**, the FHWA has established the following Noise Abatement Criteria (NAC) 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

Activity Category	dB(A) Leq	Description of Land Use Activity Areas
A	57 (exterior)	Lands on which serenity and quiet are of extra-ordinary 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 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
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.

Table 1 - FHWA Noise Abatement Criteria		
Activity Category	dB(A) Leq	Description of Land Use Activity Areas
F	--	Agricultural, 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 a receiver approaches, equals or exceeds the NAC. "Approach" is defined as one dB(A) below the FHWA NAC. For example: a noise impact would occur at a Category B residence if the noise level is predicted to be sixty-six (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 ten (10) dB(A). For example: a noise impact would occur at a Category B residence if the existing level is fifty-four (54) dB(A) and the predicted level is sixty-five (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.

The Union Square neighborhood has a discontinuous existing solid masonry wall fence adjacent to receivers, which was included in the model.

Existing and predicted traffic noise levels were modeled at receiver locations (**Table 2** and **Figures 1.1 through 1.6**) that represent the land use activity areas adjacent to the proposed roadway expansion project that might be impacted by traffic noise and potentially benefit from feasible and reasonable noise abatement.

Table 2 - Traffic Noise Levels dB(A) Leq						
Receiver	NAC Category	NAC Level	Existing	Predicted 2046	Change (+/-)	Noise Impact
R1A - Residence	B	67	69	70	+1	**Yes**
R1 - Residence	B	67	67	68	+1	**Yes**
R2 - Residence	B	67	69	68	-1	**Yes**
R2A - Residence	B	67	68	66	-2	**Yes**
R2B - Residence	B	67	68	65	-3	No
R3 - Residence	B	67	68	65	-3	No
R3A - Residence	B	67	68	65	-3	No
R3B - Residence	B	67	68	67	-1	**Yes**

Table 2 - Traffic Noise Levels dB(A) Leq						
Receiver	NAC Category	NAC Level	Existing	Predicted 2046	Change (+/-)	Noise Impact
R4 - Residence	B	67	69	69	0	Yes
R5 - Residence	B	67	68	69	+1	Yes
R6 - Residence	B	67	69	69	0	Yes
R6A - Residence	B	67	68	68	0	Yes
R6B - Residence	B	67	69	69	0	Yes
R7 - Residence	B	67	60	60	0	No
R8 - Residence	B	67	60	61	+1	No
R9 - Residence	B	67	57	60	+3	No
R10 - Residence	B	67	51	55	+4	No
R11 - Residence	B	67	56	60	+4	No
R12 - School	C	67	53	58	+5	No
R13 - Residence	B	67	56	60	+4	No
R14 - Residence	B	67	56	60	+4	No
R15 - Residence	B	67	53	57	+4	No
R16 - Residence	B	67	56	59	+3	No
R17 - Residence	B	67	56	59	+3	No
R18 - Residence	B	67	57	58	+1	No
R19 - Residence	B	67	51	55	+4	No
R20 - Residence	B	67	53	56	+3	No
R21 - Residence	B	67	54	58	+4	No
R22 - Residence	B	67	54	60	+6	No
R23 - Residence	B	67	54	59	+5	No
R24 - Event Center	C	67	61	64	+3	No
R25 - Residence	B	67	50	54	+4	No
R26 - Residence	B	67	53	57	+4	No

As Indicated in **Table 2**, the proposed project would result in a traffic noise impact and the following noise abatement measures were considered: traffic management, alteration of horizontal and/or vertical alignments, acquisition of undeveloped property to act as a buffer zone and the construction of noise walls.

Before any abatement measure can be proposed for incorporation into the proposed interchange project, it must be both feasible and reasonable. In order to be "feasible," the abatement measure must be able to reduce the noise level at greater than 50% of impacted, first row receivers by at least five (5) dB(A); and to be "reasonable," it must not exceed the cost-effectiveness criterion of $25,000 for each receiver that would benefit by a reduction of at least five (5) dB(A). The abatement measure must be able to reduce the noise level of at least one impacted, first row receiver by at least seven (7) dB(A).

Traffic management: control devices could be used to reduce the speed of the traffic; however, the minor benefit of one (1) dB(A) per five mph reduction in speed does not outweigh the associated

increase in congestion and air pollution. Other measures such as time or use restrictions for certain vehicles are prohibited on state highways.

Alteration of horizontal and/or vertical alignments: any alteration of the existing alignment would displace existing businesses and residences, require additional right of way and not be cost effective/reasonable.

Buffer zone: the acquisition of undeveloped property to act as a buffer zone is designed to avoid rather than abate traffic noise impacts and, therefore, is not feasible.

Noise barriers: this is the most commonly used noise abatement measure. Noise barriers were evaluated for each of the impacted receiver locations.

A noise barrier would be feasible and reasonable for the following impacted receivers and, therefore, is proposed for incorporation into the project (**Table 3**):

- **R1A through R6B** – These receivers represent a total of 34 residences. A continuous noise barrier would block access to an existing street, so a barrier in two segments was proposed. Based on preliminary calculations, a noise barrier 2,219 feet in length and 8 feet in height would reduce noise levels by at least 5 dB(A) for 6 benefited receivers and at least 7 dB(A) for 26 benefited receivers at a total cost of $319,470 or $9,983 for each benefited receiver.

Table 3 - Noise Barrier Proposal (preliminary)

Barrier	Representative Receivers	Total # Benefited	Length	Height	Total Cost	$/Benefited Receiver
Proposed Barrier 1	R1A thru R6B	32	2,219 feet	8 feet	$319,470	$9,983

Any subsequent project design changes may require a reevaluation of this preliminary noise barrier proposal. The final decision to construct the proposed noise barrier will not be made until completion of the project design, utility evaluation and polling of adjacent property owners.

To avoid noise impacts that may result from future development of properties adjacent to the 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 (2046) noise impact contours (**Table 4**).

Table 4 - Noise Impact Contours

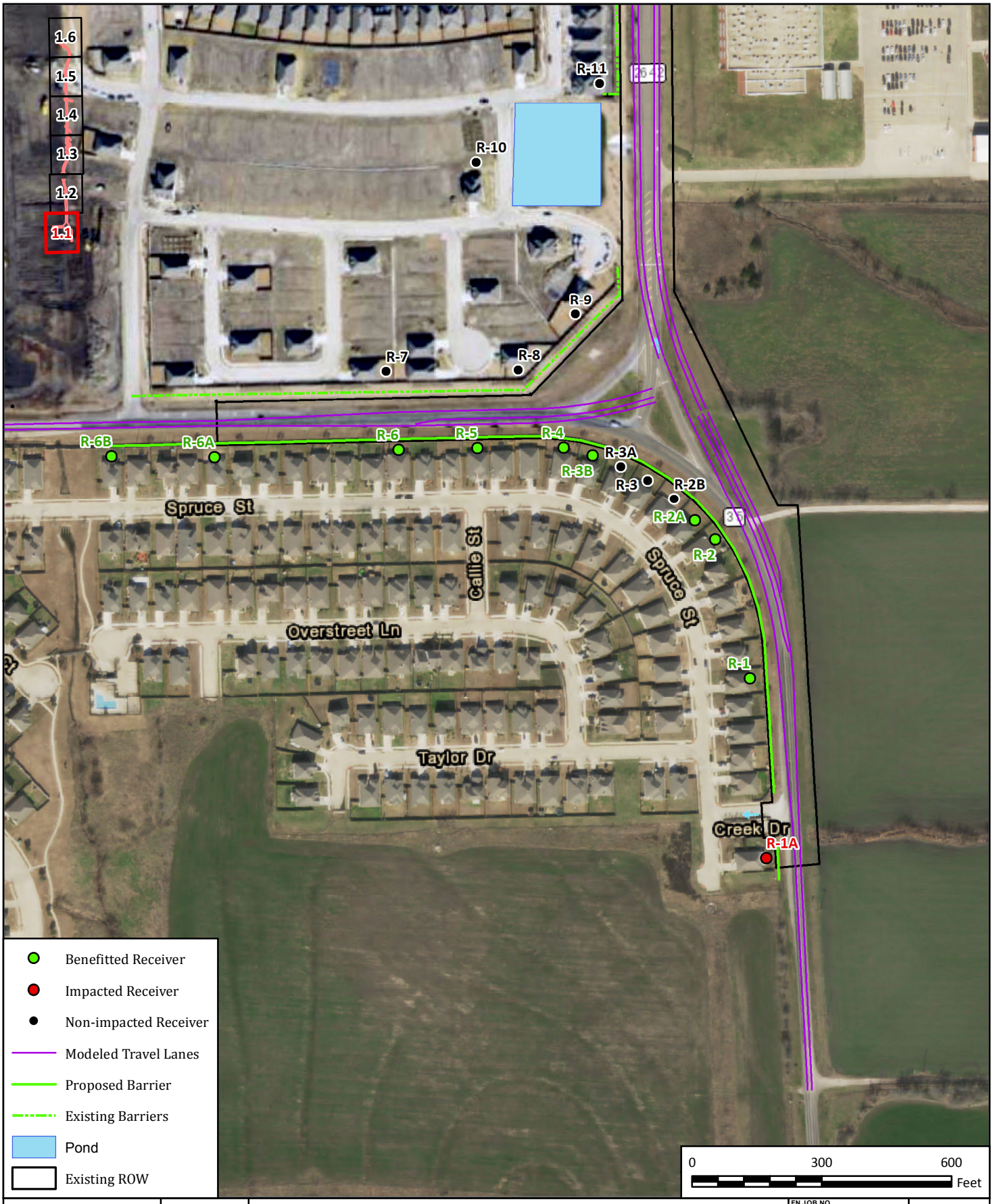
Land Use	Impact Contour	Distance from Right of Way
NAC category B&C	66 dB (A)	50 feet
NAC category E	71 dB (A)	0 feet

Noise associated with the construction of the 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 is expected to be exposed to construction noise for a long duration; therefore, any extended disruption of normal activities is not expected. Provisions will 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 will be 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 project.

Figures



FREESE AND NICHOLS
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HUNT COUNTY

FM 2642 (FM 35 to SH 66)

Noise Impacts Analysis
Proposed Year 2046

FN JOB NO	HUC17463
FILE NAME	1_Noise_Analysis.mxd
DATE	7/18/2019
SCALE	1:3,600
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1.1
FIGURE

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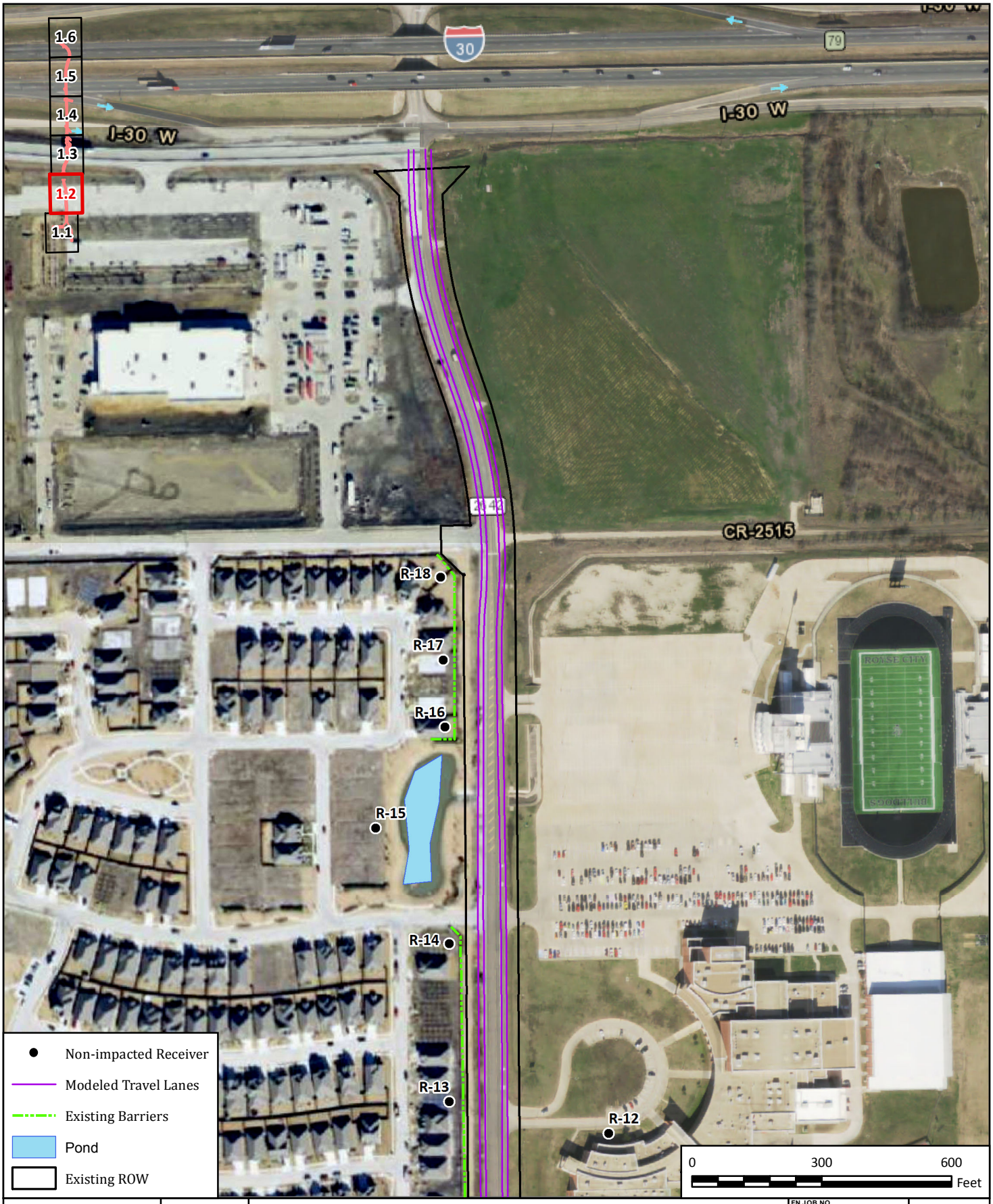
NAD 1983 StatePlane Texas North Central FIPS 4202 Feet
Base Map: BING Imagery Service & 2018 NAIP



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NAD 1983 StatePlane Texas North Central FIPS 4202 Feet
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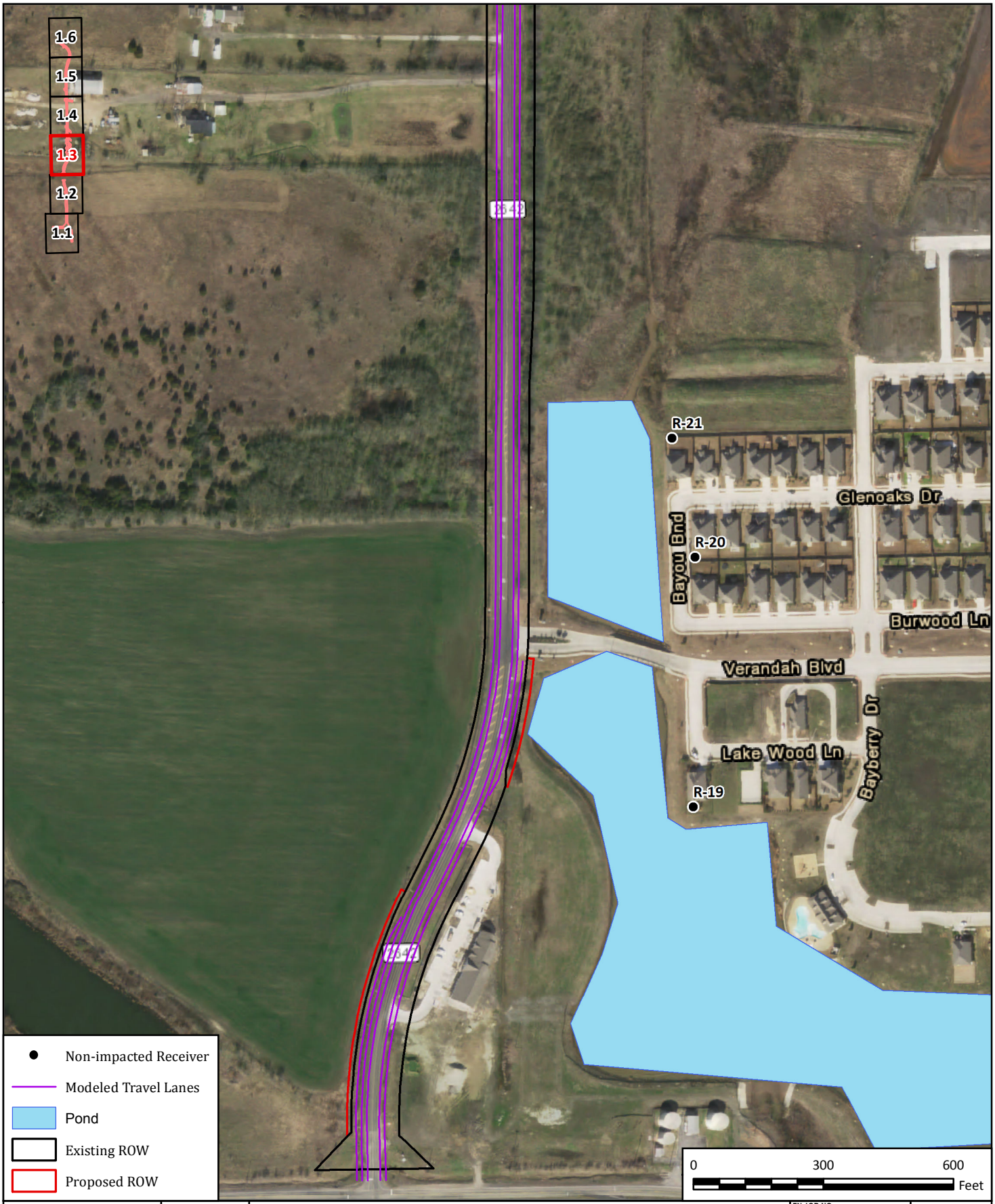

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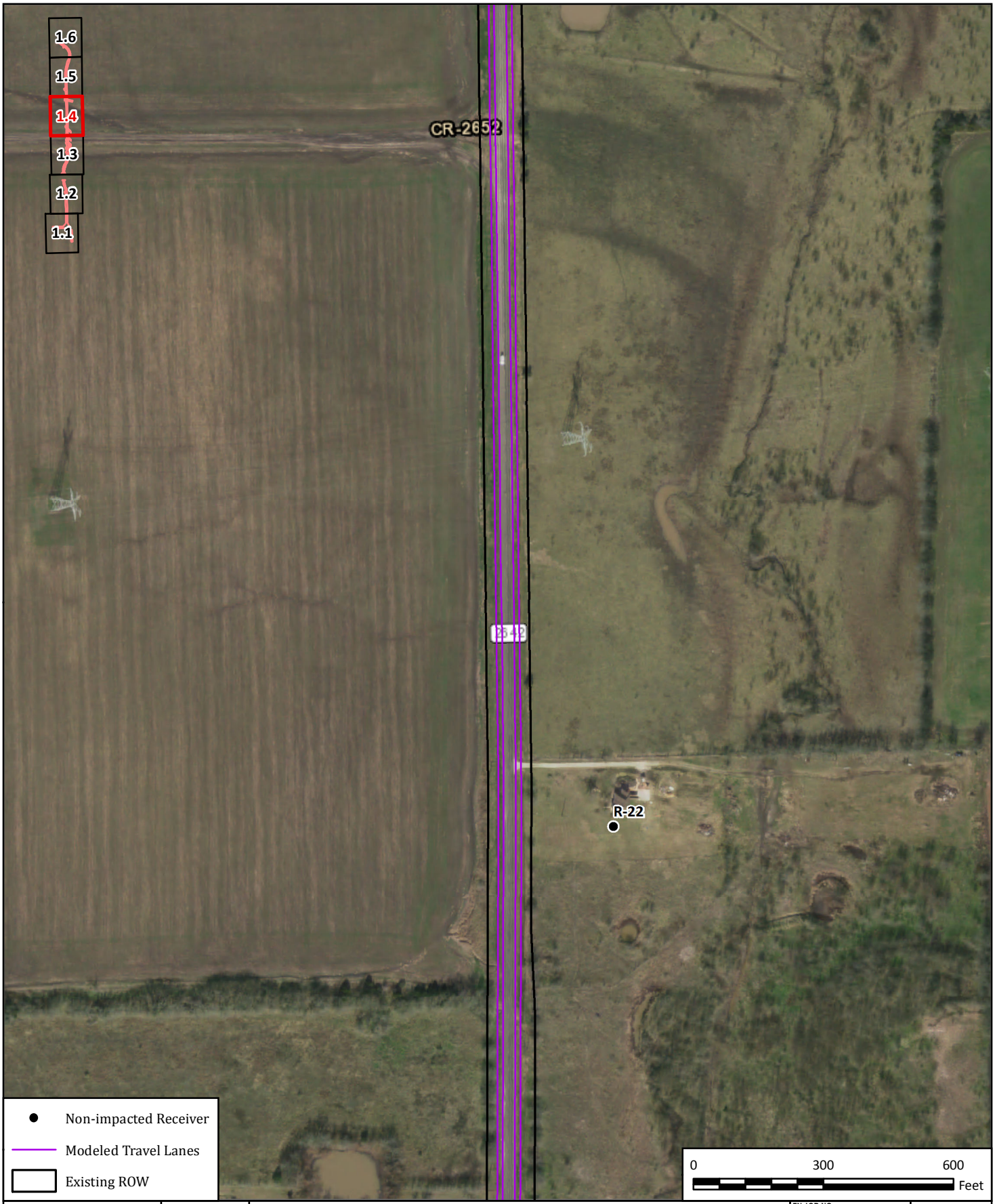

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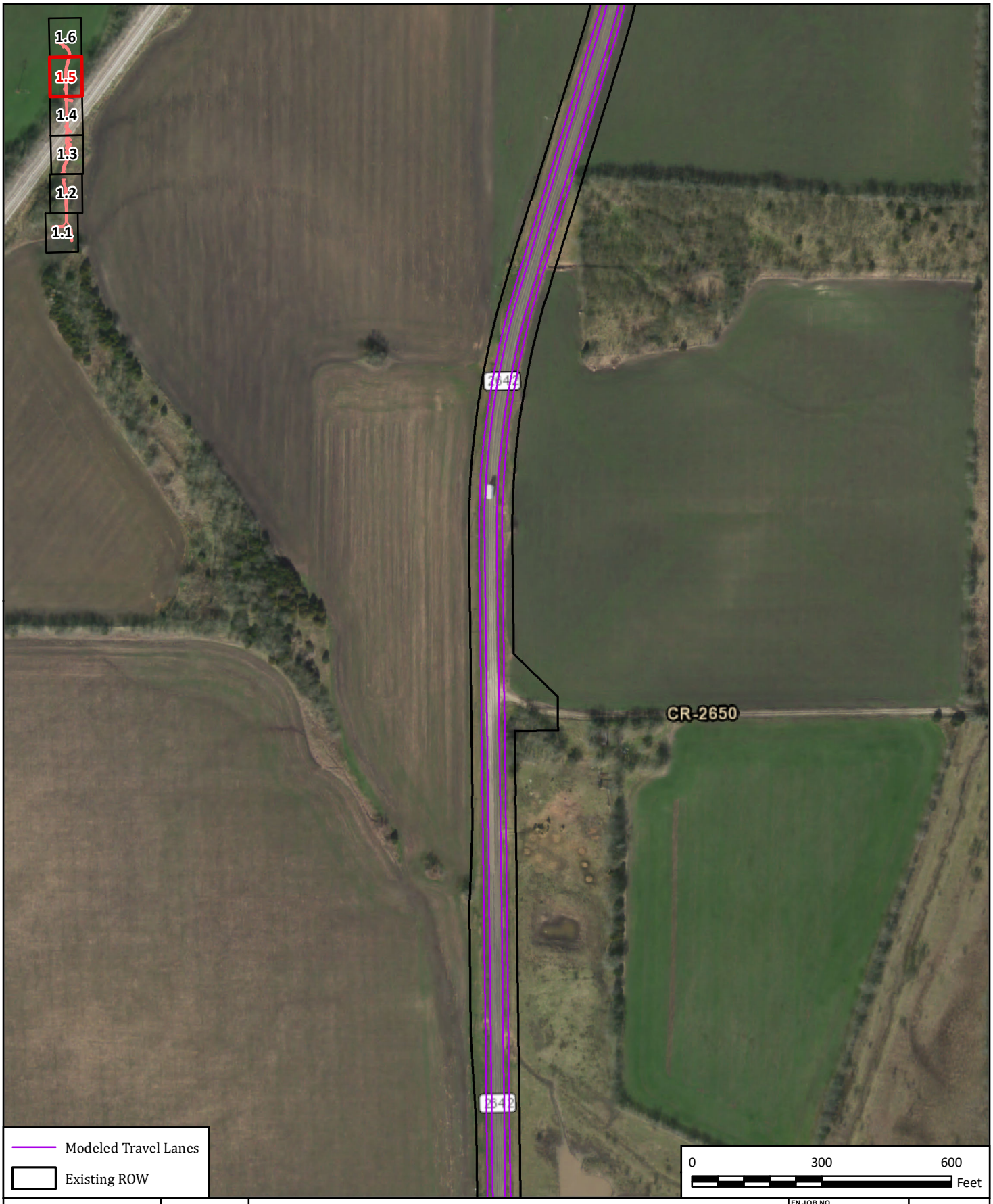

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Base Map: BING Imagery Service & 2018 NAIP

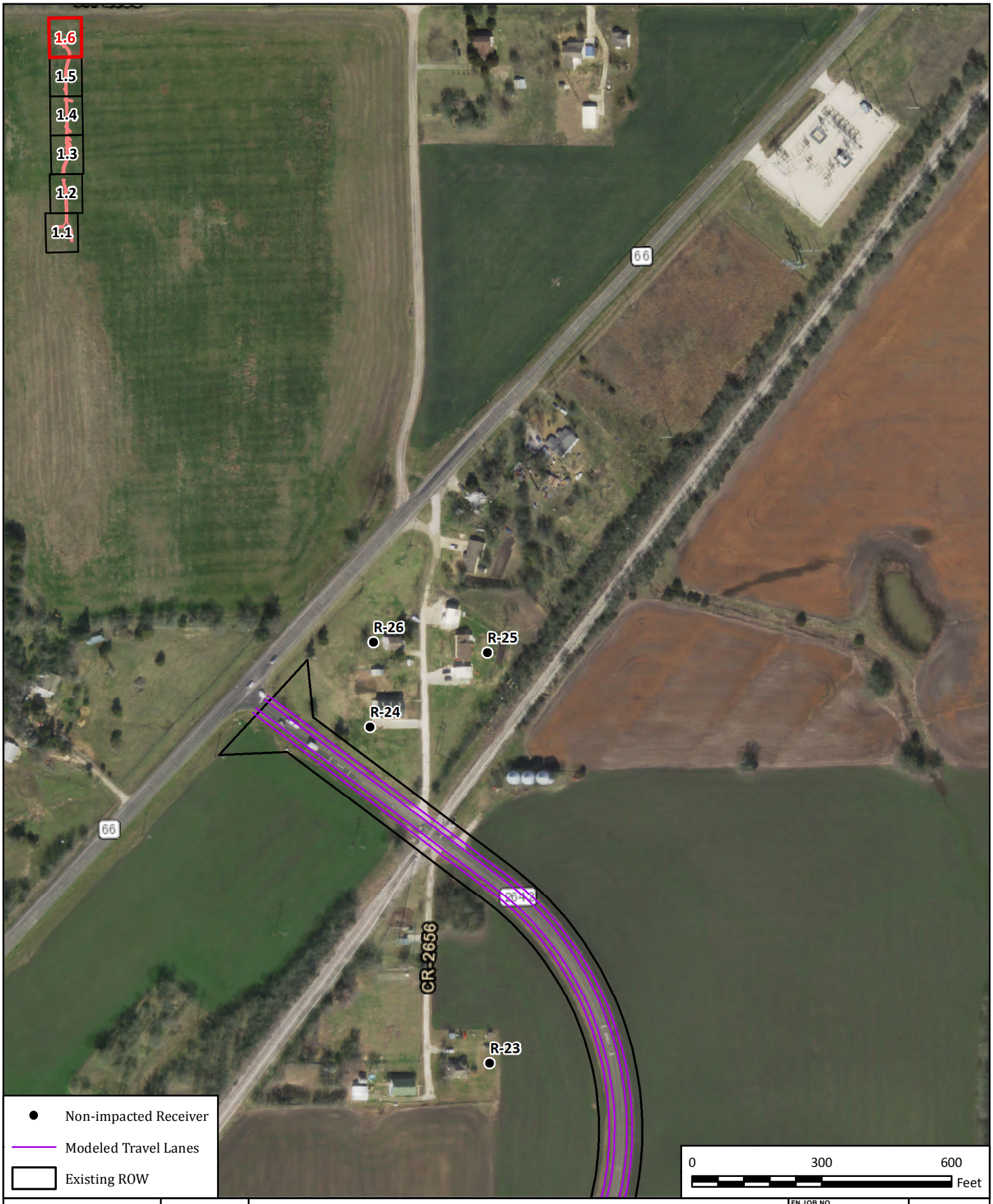

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FIGURE

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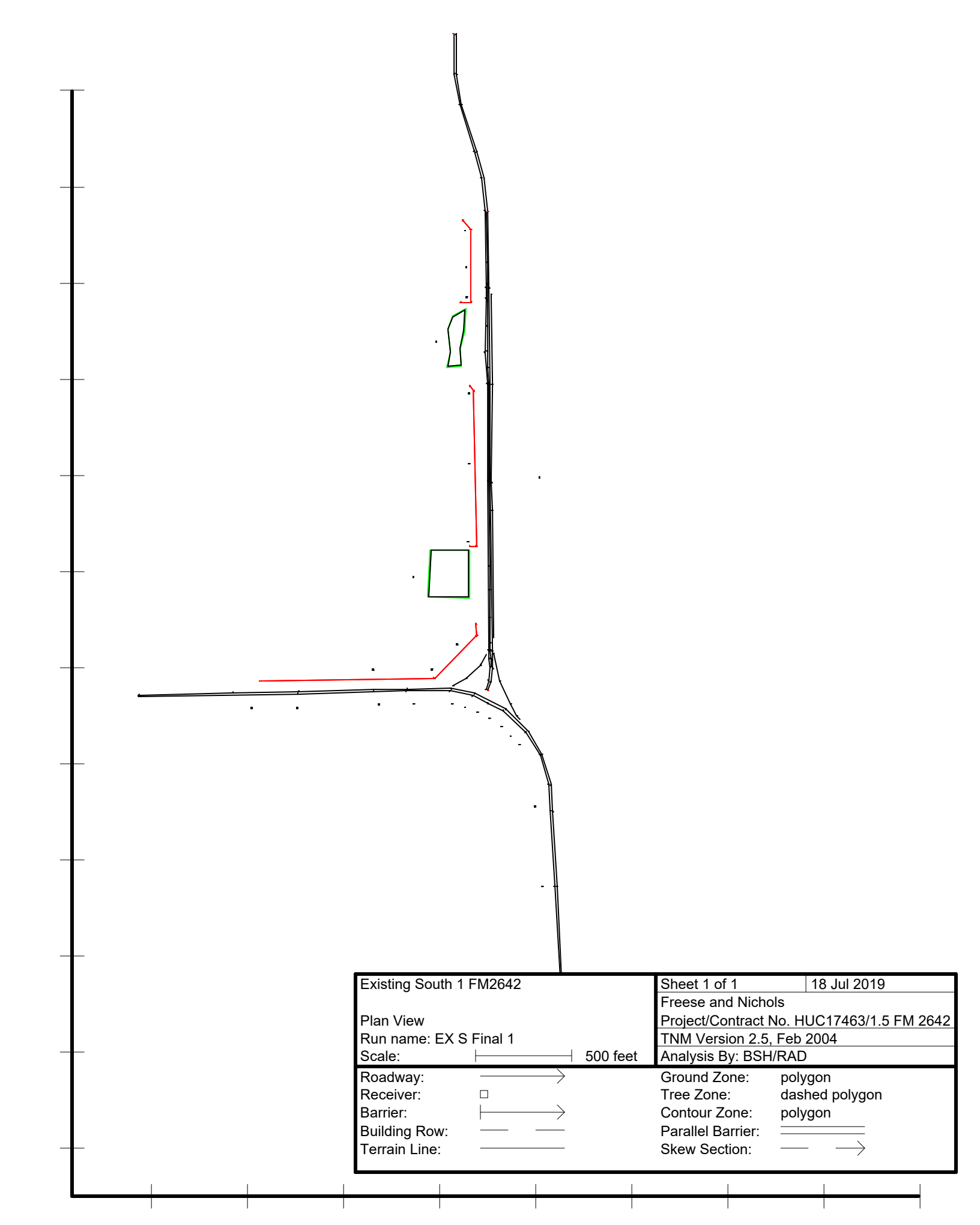
NAD 1983 StatePlane Texas North Central FIPS 4202 Feet
Base Map: BING Imagery Service & 2018 NAIP

Noise Model Summary Data



Existing South 1 FM2642	Sheet 1 of 1 | 18 Jul 2019
	Freese and Nichols
Plan View	Project/Contract No. HUC17463/1.5 FM 2642
Run name: EX S Final 1	TNM Version 2.5, Feb 2004
Scale: 500 feet	Analysis By: BSH/RAD

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

Freese and Nichols
BSH/RAD
15 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Existing South 1 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-1	1	7	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
R-2	2	3	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
R-3	3	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
R-4	4	2	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
R-5	5	3	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
R-6	6	5	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
R-7	7	2	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
R-8	8	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
R-9	9	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
R-10	10	2	0.0	51.7	66	51.7	10	----	51.7	0.0	8	-8.0
R-11	11	4	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
R-12	12	1	0.0	53.1	66	53.1	10	----	53.1	0.0	8	-8.0
R-13	13	8	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
R-14	14	4	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
R-15	15	2	0.0	53.8	66	53.8	10	----	53.8	0.0	8	-8.0
R-16	16	2	0.0	56.4	66	56.4	10	----	56.4	0.0	8	-8.0
R-17	17	3	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
R-18	18	2	0.0	57.4	66	57.4	10	----	57.4	0.0	8	-8.0
R-1A	19	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
R-2A	20	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	8	-8.0
R-2B	21	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
R-3A	22	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
R-3B	23	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
R-6A	24	6	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0

R-6B	25	2	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**									
			Min	**Avg**	**Max**							
			dB	**dB**	**dB**							
All Selected		66	0.0	0.0	0.0							
All Impacted		34	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

Freese and Nichols
BSH/RAD
15 July 2019
TNM 2.5
Calculated with TNM 2.5

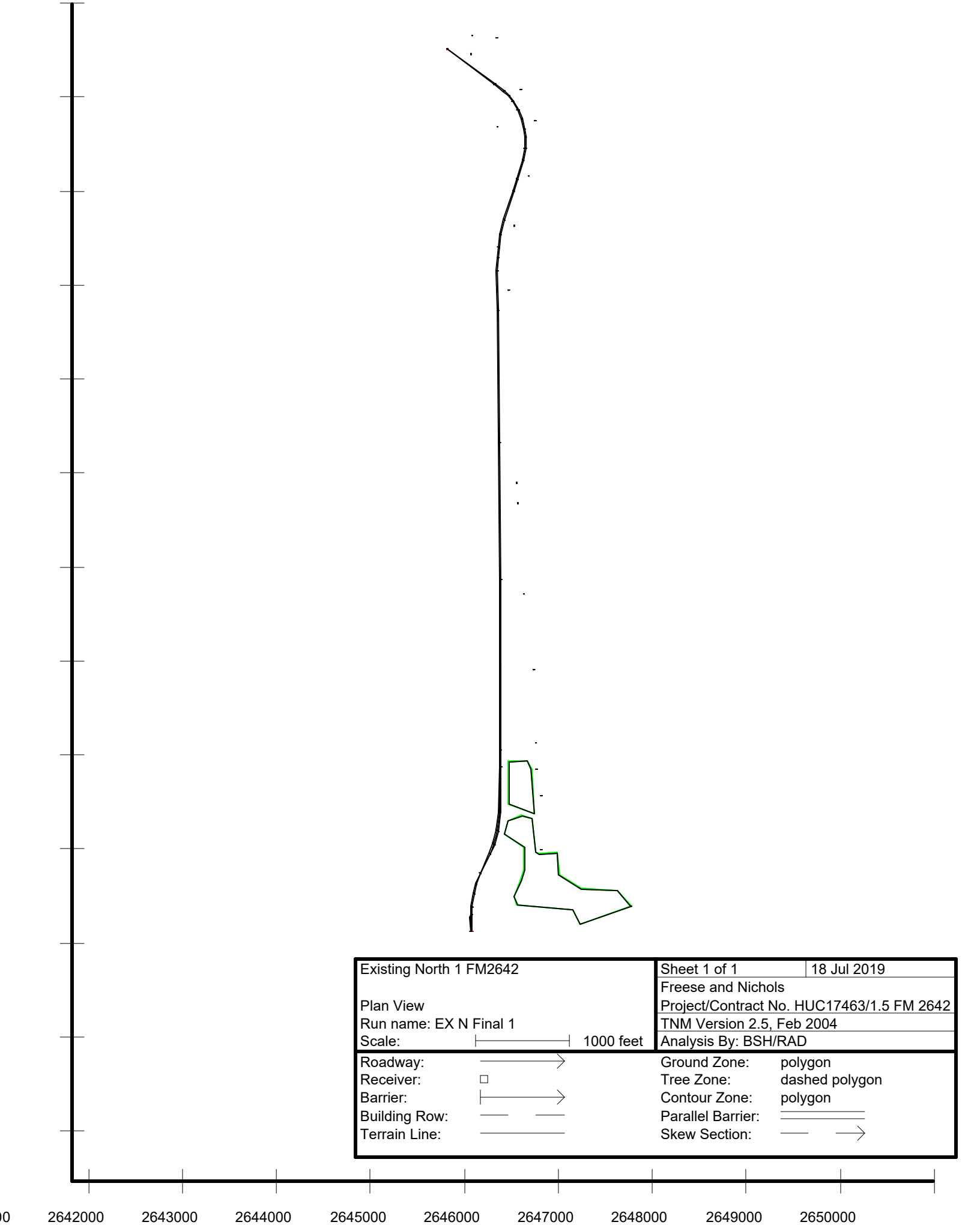
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Existing South 2 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-1	1	7	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
R-2	2	3	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
R-3	3	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	8	-8.0
R-4	4	2	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
R-5	5	3	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0
R-6	6	5	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
R-7	7	2	0.0	60.6	66	60.6	10	----	60.6	0.0	8	-8.0
R-8	8	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
R-9	9	1	0.0	57.2	66	57.2	10	----	57.2	0.0	8	-8.0
R-10	10	2	0.0	51.6	66	51.6	10	----	51.6	0.0	8	-8.0
R-11	11	4	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
R-12	12	1	0.0	53.6	66	53.6	10	----	53.6	0.0	8	-8.0
R-13	13	8	0.0	56.7	66	56.7	10	----	56.7	0.0	8	-8.0
R-14	14	4	0.0	56.5	66	56.5	10	----	56.5	0.0	8	-8.0
R-15	15	2	0.0	53.4	66	53.4	10	----	53.4	0.0	8	-8.0
R-16	16	2	0.0	56.3	66	56.3	10	----	56.3	0.0	8	-8.0
R-17	17	3	0.0	56.6	66	56.6	10	----	56.6	0.0	8	-8.0
R-18	18	2	0.0	56.9	66	56.9	10	----	56.9	0.0	8	-8.0
R-1A	19	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	8	-8.0
R-2A	20	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
R-2B	21	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
R-3A	22	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
R-3B	23	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
R-6A	24	6	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	8	-8.0

R-6B	25	2	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		66	0.0	0.0	0.0
All Impacted		34	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0



Existing North 1 FM2642	Sheet 1 of 1 | 18 Jul 2019
	Freese and Nichols
Plan View	Project/Contract No. HUC17463/1.5 FM 2642
Run name: EX N Final 1	TNM Version 2.5, Feb 2004
Scale: 1000 feet	Analysis By: BSH/RAD

Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

Freese and Nichols
BSH/RAD
15 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Existing North 1 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-19	1	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
R-20	2	2	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0
R-21	3	1	0.0	54.1	66	54.1	10	----	54.1	0.0	5	-5.0
Fut-27	4	4	0.0	52.4	66	52.4	10	----	52.4	0.0	5	-5.0
Fut-28	5	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
R-22	6	1	0.0	54.8	66	54.8	10	----	54.8	0.0	5	-5.0
Fut-29	7	1	0.0	56.9	66	56.9	10	----	56.9	0.0	5	-5.0
Fut-30	8	1	0.0	57.4	66	57.4	10	----	57.4	0.0	5	-5.0
Fut-31	9	7	0.0	60.8	66	60.8	10	----	60.8	0.0	5	-5.0
Fut-32	10	8	0.0	61.2	66	61.2	10	----	61.2	0.0	5	-5.0
Fut-33	11	10	0.0	61.9	66	61.9	10	----	61.9	0.0	5	-5.0
Fut-34	12	10	0.0	60.8	66	60.8	10	----	60.8	0.0	5	-5.0
Fut-35	13	10	0.0	59.3	66	59.3	10	----	59.3	0.0	5	-5.0
R-23	14	1	0.0	54.2	66	54.2	10	----	54.2	0.0	5	-5.0
R-24	15	1	0.0	61.5	66	61.5	10	----	61.5	0.0	5	-5.0
R-25	16	1	0.0	50.3	66	50.3	10	----	50.3	0.0	5	-5.0
R-26	17	1	0.0	53.5	66	53.5	10	----	53.5	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	61	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

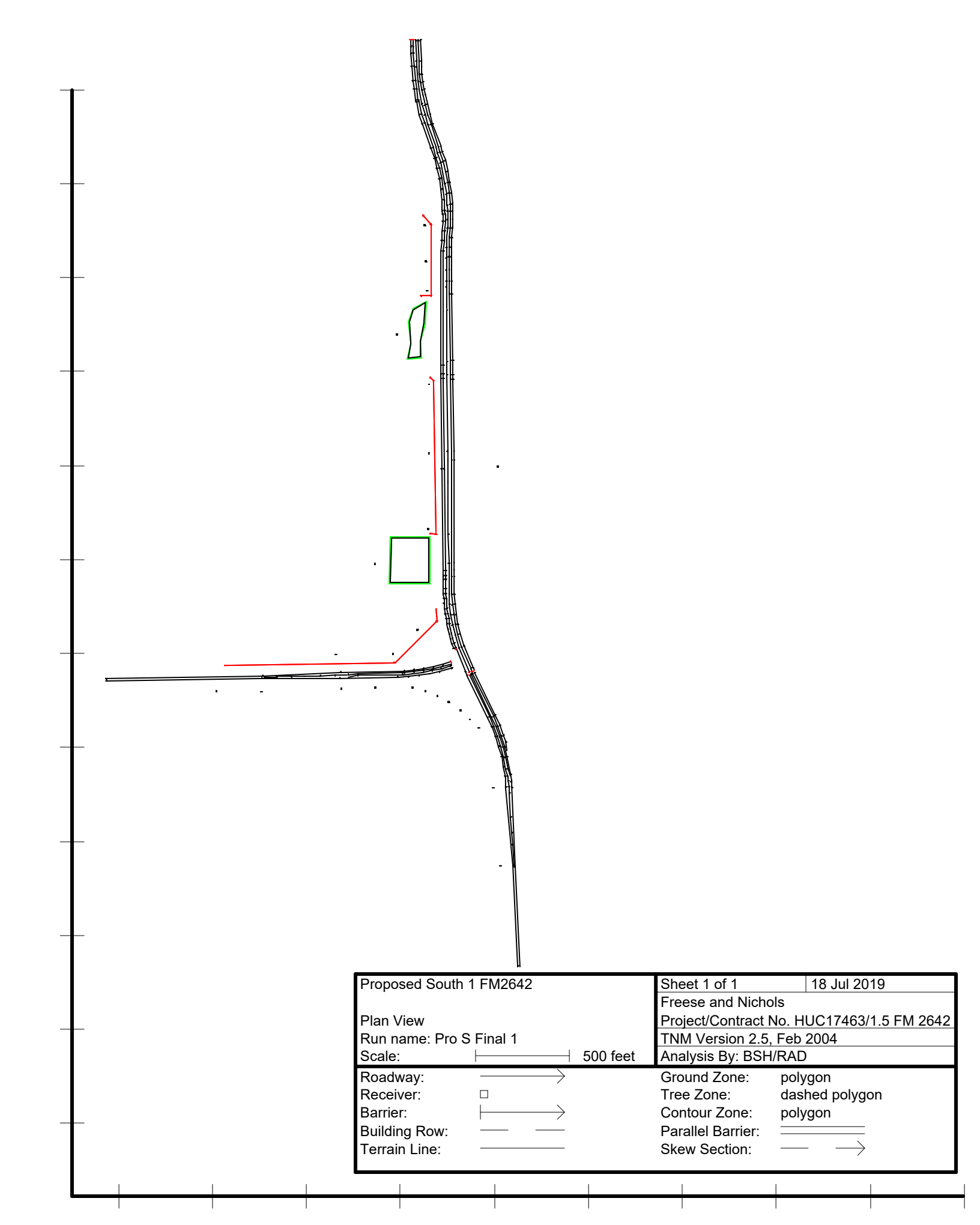
Freese and Nichols
BSH/RAD
15 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Existing North 2 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-19	1	1	0.0	51.2	66	51.2	10	----	51.2	0.0	5	-5.0
R-20	2	2	0.0	52.9	66	52.9	10	----	52.9	0.0	5	-5.0
R-21	3	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
Fut-27	4	4	0.0	52.2	66	52.2	10	----	52.2	0.0	5	-5.0
Fut-28	5	1	0.0	51.7	66	51.7	10	----	51.7	0.0	5	-5.0
R-22	6	1	0.0	54.8	66	54.8	10	----	54.8	0.0	5	-5.0
Fut-29	7	1	0.0	57.1	66	57.1	10	----	57.1	0.0	5	-5.0
Fut-30	8	1	0.0	57.6	66	57.6	10	----	57.6	0.0	5	-5.0
Fut-31	9	7	0.0	61.0	66	61.0	10	----	61.0	0.0	5	-5.0
Fut-32	10	8	0.0	61.4	66	61.4	10	----	61.4	0.0	5	-5.0
Fut-33	11	10	0.0	62.1	66	62.1	10	----	62.1	0.0	5	-5.0
Fut-34	12	10	0.0	61.0	66	61.0	10	----	61.0	0.0	5	-5.0
Fut-35	13	10	0.0	59.5	66	59.5	10	----	59.5	0.0	5	-5.0
R-23	14	1	0.0	54.0	66	54.0	10	----	54.0	0.0	5	-5.0
R-24	15	1	0.0	61.8	66	61.8	10	----	61.8	0.0	5	-5.0
R-25	16	1	0.0	50.0	66	50.0	10	----	50.0	0.0	5	-5.0
R-26	17	1	0.0	53.0	66	53.0	10	----	53.0	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	61	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0


Proposed South 1 FM2642
Plan View
Run name: Pro S Final 1
Scale: 500 feet
Sheet 1 of 1
18 Jul 2019
Freese and Nichols
Project/Contract No. HUC17463/1.5 FM 2642
TNM Version 2.5, Feb 2004
Analysis By: BSH/RAD
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
43500
2644000
2644500
2645000
2645500
2646000
2646500
2647000
2647500
2648000

Freese and Nichols
BSH/RAD
16 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Proposed South 1 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-1	1	7	67.0	68.8	66	1.8	11	Snd Lvl	68.8	0.0	8	-8.0
R-2	2	3	69.0	68.6	66	-0.4	11	Snd Lvl	68.6	0.0	8	-8.0
R-3	3	1	68.0	65.0	66	-3.0	11	----	65.0	0.0	8	-8.0
R-4	4	2	69.0	69.3	66	0.3	11	Snd Lvl	69.3	0.0	8	-8.0
R-5	5	3	68.0	69.9	66	1.9	11	Snd Lvl	69.9	0.0	8	-8.0
R-6	6	5	69.0	69.9	66	0.9	11	Snd Lvl	69.9	0.0	8	-8.0
R-7	7	2	60.0	60.9	66	0.9	11	----	60.9	0.0	8	-8.0
R-8	8	1	60.0	61.6	66	1.6	11	----	61.6	0.0	8	-8.0
R-9	9	1	57.0	60.1	66	3.1	11	----	60.1	0.0	8	-8.0
R-10	10	2	51.0	55.6	66	4.6	11	----	55.6	0.0	8	-8.0
R-11	11	4	56.0	59.9	66	3.9	11	----	59.9	0.0	8	-8.0
R-12	12	1	53.0	57.3	66	4.3	11	----	57.3	0.0	8	-8.0
R-13	13	8	56.0	60.0	66	4.0	11	----	60.0	0.0	8	-8.0
R-14	14	4	56.0	59.9	66	3.9	11	----	59.9	0.0	8	-8.0
R-15	15	2	53.0	57.3	66	4.3	11	----	57.3	0.0	8	-8.0
R-16	16	2	56.0	59.3	66	3.3	11	----	59.3	0.0	8	-8.0
R-17	17	3	56.0	59.4	66	3.4	11	----	59.4	0.0	8	-8.0
R-18	18	2	57.0	58.6	66	1.6	11	----	58.6	0.0	8	-8.0
R-1A	19	1	69.0	70.0	66	1.0	11	Snd Lvl	70.0	0.0	8	-8.0
R-2A	20	1	68.0	66.7	66	-1.3	11	Snd Lvl	66.7	0.0	8	-8.0
R-2B	21	1	68.0	65.6	66	-2.4	11	----	65.6	0.0	8	-8.0
R-3A	22	1	68.0	65.4	66	-2.6	11	----	65.4	0.0	8	-8.0
R-3B	23	1	68.0	67.0	66	-1.0	11	Snd Lvl	67.0	0.0	8	-8.0
R-6A	24	6	68.0	68.6	66	0.6	11	Snd Lvl	68.6	0.0	8	-8.0

R-6B	25	2	69.0	69.3	66	0.3	11	Snd Lvl	69.3	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		66	0.0	0.0	0.0
All Impacted		31	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0

Freese and Nichols
BSH/RAD
16 July 2019
TNM 2.5
Calculated with TNM 2.5

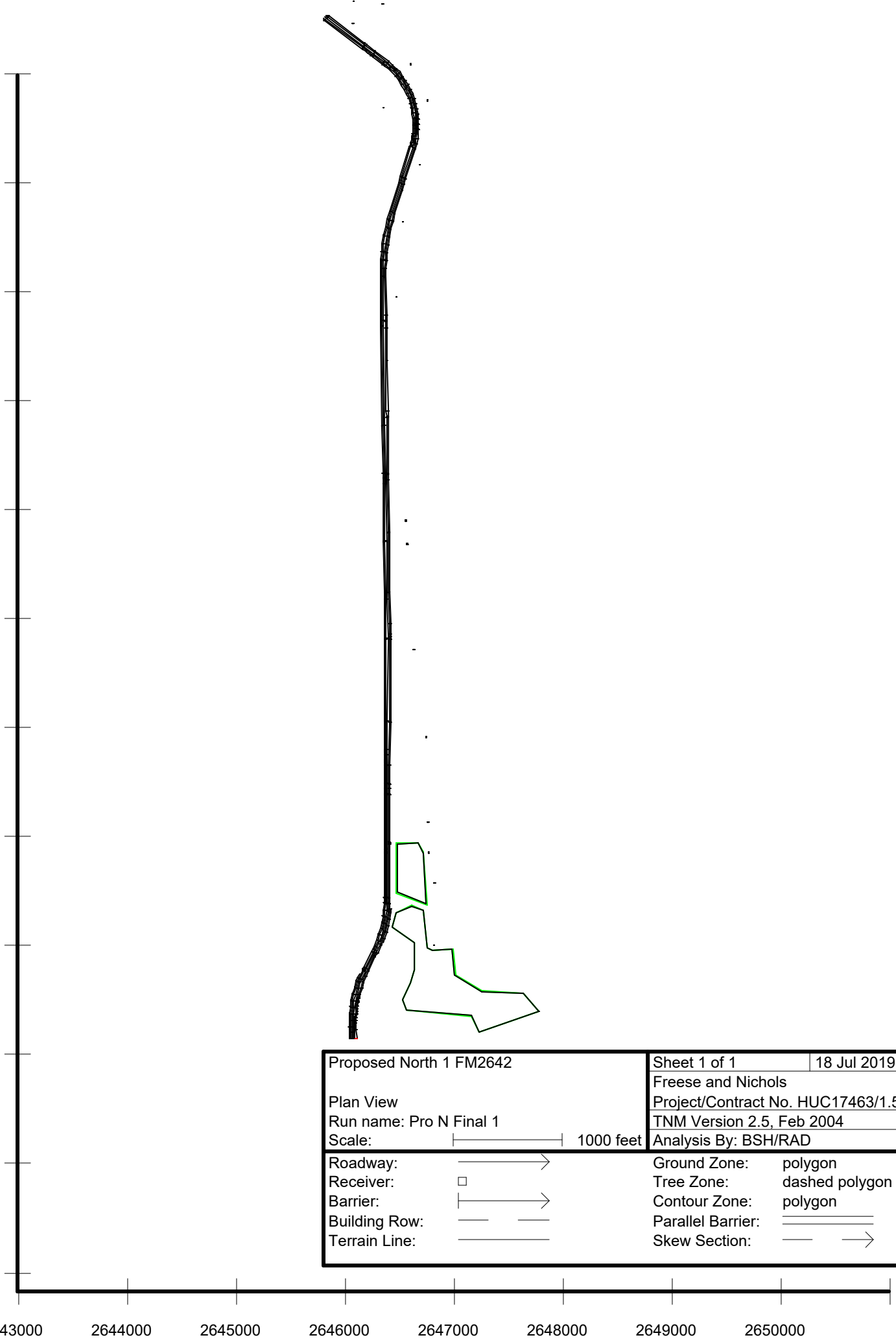
RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Proposed South 2 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-1	1	7	67.0	68.8	66	1.8	11	Snd Lvl	68.8	0.0	8	-8.0
R-2	2	3	69.0	68.5	66	-0.5	11	Snd Lvl	68.5	0.0	8	-8.0
R-3	3	1	68.0	64.8	66	-3.2	11	----	64.8	0.0	8	-8.0
R-4	4	2	69.0	69.3	66	0.3	11	Snd Lvl	69.3	0.0	8	-8.0
R-5	5	3	68.0	69.9	66	1.9	11	Snd Lvl	69.9	0.0	8	-8.0
R-6	6	5	69.0	69.9	66	0.9	11	Snd Lvl	69.9	0.0	8	-8.0
R-7	7	2	60.0	60.8	66	0.8	11	----	60.8	0.0	8	-8.0
R-8	8	1	60.0	61.5	66	1.5	11	----	61.5	0.0	8	-8.0
R-9	9	1	57.0	59.8	66	2.8	11	----	59.8	0.0	8	-8.0
R-10	10	2	51.0	55.1	66	4.1	11	----	55.1	0.0	8	-8.0
R-11	11	4	56.0	60.2	66	4.2	11	----	60.2	0.0	8	-8.0
R-12	12	1	53.0	58.0	66	5.0	11	----	58.0	0.0	8	-8.0
R-13	13	8	56.0	60.4	66	4.4	11	----	60.4	0.0	8	-8.0
R-14	14	4	56.0	60.3	66	4.3	11	----	60.3	0.0	8	-8.0
R-15	15	2	53.0	56.8	66	3.8	11	----	56.8	0.0	8	-8.0
R-16	16	2	56.0	59.7	66	3.7	11	----	59.7	0.0	8	-8.0
R-17	17	3	56.0	59.7	66	3.7	11	----	59.7	0.0	8	-8.0
R-18	18	2	57.0	58.9	66	1.9	11	----	58.9	0.0	8	-8.0
R-1A	19	1	69.0	70.0	66	1.0	11	Snd Lvl	70.0	0.0	8	-8.0
R-2A	20	1	68.0	66.6	66	-1.4	11	Snd Lvl	66.6	0.0	8	-8.0
R-2B	21	1	68.0	65.4	66	-2.6	11	----	65.4	0.0	8	-8.0
R-3A	22	1	68.0	65.2	66	-2.8	11	----	65.2	0.0	8	-8.0
R-3B	23	1	68.0	66.9	66	-1.1	11	Snd Lvl	66.9	0.0	8	-8.0
R-6A	24	6	68.0	68.6	66	0.6	11	Snd Lvl	68.6	0.0	8	-8.0

R-6B	25	2	69.0	69.3	66	0.3	11	Snd Lvl	69.3	0.0	8	-8.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		66	0.0	0.0	0.0
All Impacted		31	0.0	0.0	0.0
All that meet NR Goal		0	0.0	0.0	0.0



Proposed North 1 FM2642		Sheet 1 of 1	18 Jul 2019
		Freese and Nichols	
Plan View		Project/Contract No. HUC17463/1.5 FM 2642	
Run name: Pro N Final 1		TNM Version 2.5, Feb 2004	
Scale:	1000 feet	Analysis By: BSH/RAD	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

Freese and Nichols
BSH/RAD
15 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Proposed North 1 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-19	1	1	51.0	55.3	66	4.3	11	----	55.3	0.0	5	-5.0
R-20	2	2	53.0	56.9	66	3.9	11	----	56.9	0.0	5	-5.0
R-21	3	1	54.0	58.1	66	4.1	11	----	58.1	0.0	5	-5.0
Fut-27	4	4	52.0	56.9	66	4.9	11	----	56.9	0.0	5	-5.0
Fut-28	5	1	51.0	56.9	66	5.9	11	----	56.9	0.0	5	-5.0
R-22	6	1	54.0	60.1	66	6.1	11	----	60.1	0.0	5	-5.0
Fut-29	7	1	57.0	61.7	66	4.7	11	----	61.7	0.0	5	-5.0
Fut-30	8	1	57.0	62.0	66	5.0	11	----	62.0	0.0	5	-5.0
Fut-31	9	7	61.0	64.6	66	3.6	11	----	64.6	0.0	5	-5.0
Fut-32	10	8	61.0	65.1	66	4.1	11	----	65.1	0.0	5	-5.0
Fut-33	11	10	62.0	65.3	66	3.3	11	----	65.3	0.0	5	-5.0
Fut-34	12	10	61.0	63.9	66	2.9	11	----	63.9	0.0	5	-5.0
Fut-35	13	10	59.0	62.4	66	3.4	11	----	62.4	0.0	5	-5.0
R-23	14	1	54.0	58.3	66	4.3	11	----	58.3	0.0	5	-5.0
R-24	15	1	61.0	64.8	66	3.8	11	----	64.8	0.0	5	-5.0
R-25	16	1	50.0	54.0	66	4.0	11	----	54.0	0.0	5	-5.0
R-26	17	1	53.0	57.4	66	4.4	11	----	57.4	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	61	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Freese and Nichols
BSH/RAD

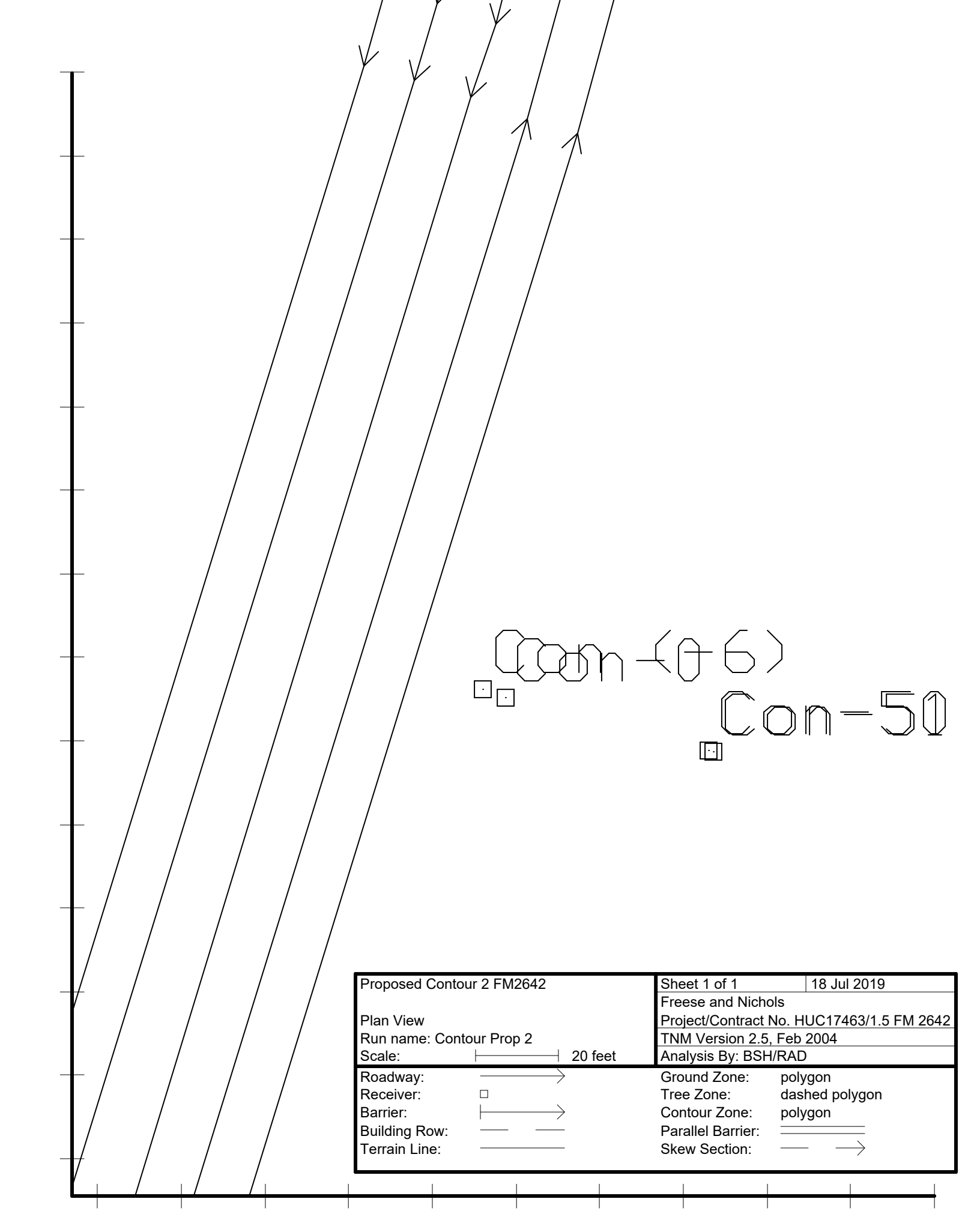
15 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Proposed North 2 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R-19	1	1	51.0	54.6	66	3.6	11	----	54.6	0.0	5	-5.0
R-20	2	2	53.0	56.2	66	3.2	11	----	56.2	0.0	5	-5.0
R-21	3	1	54.0	57.3	66	3.3	11	----	57.3	0.0	5	-5.0
Fut-27	4	4	52.0	56.0	66	4.0	11	----	56.0	0.0	5	-5.0
Fut-28	5	1	51.0	55.9	66	4.9	11	----	55.9	0.0	5	-5.0
R-22	6	1	54.0	59.2	66	5.2	11	----	59.2	0.0	5	-5.0
Fut-29	7	1	57.0	61.0	66	4.0	11	----	61.0	0.0	5	-5.0
Fut-30	8	1	57.0	61.3	66	4.3	11	----	61.3	0.0	5	-5.0
Fut-31	9	7	61.0	64.4	66	3.4	11	----	64.4	0.0	5	-5.0
Fut-32	10	8	61.0	64.9	66	3.9	11	----	64.9	0.0	5	-5.0
Fut-33	11	10	62.0	65.3	66	3.3	11	----	65.3	0.0	5	-5.0
Fut-34	12	10	61.0	63.8	66	2.8	11	----	63.8	0.0	5	-5.0
Fut-35	13	10	59.0	62.2	66	3.2	11	----	62.2	0.0	5	-5.0
R-23	14	1	54.0	59.3	66	5.3	11	----	59.3	0.0	5	-5.0
R-24	15	1	61.0	64.7	66	3.7	11	----	64.7	0.0	5	-5.0
R-25	16	1	50.0	53.2	66	3.2	11	----	53.2	0.0	5	-5.0
R-26	17	1	53.0	56.5	66	3.5	11	----	56.5	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	61	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0



Proposed Contour 2 FM2642		Sheet 1 of 1	18 Jul 2019
		Freese and Nichols	
Plan View		Project/Contract No. HUC17463/1.5 FM 2642	
Run name: Contour Prop 2		TNM Version 2.5, Feb 2004	
Scale:	20 feet	Analysis By: BSH/RAD	
Roadway:		Ground Zone:	polygon
Receiver:		Tree Zone:	dashed polygon
Barrier:		Contour Zone:	polygon
Building Row:		Parallel Barrier:	
Terrain Line:		Skew Section:	

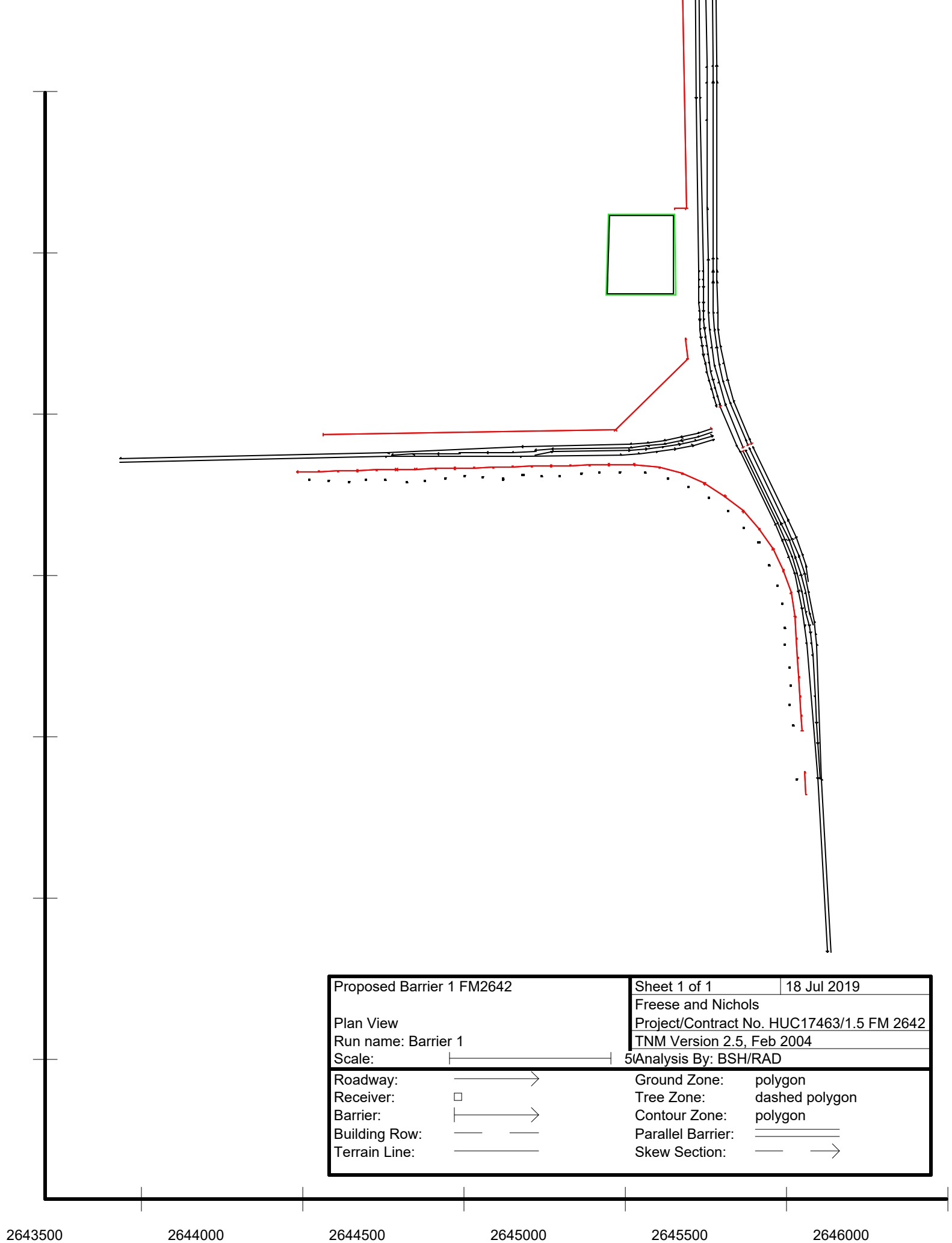
Freese and Nichols
BSH/RAD
16 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Proposed Contour 2 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Con-51	18	1	0.0	65.9	66	65.9	11	----	65.9	0.0	5	-5.0
Con-50	19	1	0.0	66.0	66	66.0	11	Snd Lvl	66.0	0.0	5	-5.0
Con-0	20	1	0.0	71.6	66	71.6	11	Snd Lvl	71.6	0.0	5	-5.0
Con (-6)	21	1	0.0	72.4	66	72.4	11	Snd Lvl	72.4	0.0	5	-5.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	4	0.0	0.0	0.0
All Impacted	3	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0


Proposed Barrier 1 FM2642
Plan View
Run name: Barrier 1
Scale:
Sheet 1 of 1
18 Jul 2019
Freese and Nichols
Project/Contract No. HUC17463/1.5 FM 2642
TNM Version 2.5, Feb 2004
Analysis By: BSH/RAD
Roadway:
Receiver:
Barrier:
Building Row:
Terrain Line:
Ground Zone: polygon
Tree Zone: dashed polygon
Contour Zone: polygon
Parallel Barrier:
Skew Section:
2643500
2644000
2644500
2645000
2645500
2646000

Freese and Nichols
BSH/RAD
18 July 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: HUC17463/1.5 FM 2642
RUN: Proposed Barrier 1 FM2642
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

Average pavement type shall be used unless a State highway agency substantiates the use of a different type with approval of FHWA.

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1A	26	1	69.0	70.1	66	1.1	11	Snd Lvl	66.0	4.1	5	-0.9
R-b2	27	1	67.0	70.4	66	3.4	11	Snd Lvl	65.7	4.7	5	-0.3
R-b3	28	1	67.0	69.4	66	2.4	11	Snd Lvl	61.6	7.8	5	2.8
R-b4	29	1	67.0	70.0	66	3.0	11	Snd Lvl	61.0	9.0	5	4.0
R-b5	30	1	67.0	70.0	66	3.0	11	Snd Lvl	60.9	9.1	5	4.1
R1	31	1	67.0	68.9	66	1.9	11	Snd Lvl	60.3	8.6	5	3.6
R-b7	32	1	67.0	69.5	66	2.5	11	Snd Lvl	60.6	8.9	5	3.9
R-b8	33	1	67.0	69.7	66	2.7	11	Snd Lvl	60.7	9.0	5	4.0
R-b9	34	1	69.0	69.5	66	0.5	11	Snd Lvl	60.6	8.9	5	3.9
R-b10	35	1	69.0	68.9	66	-0.1	11	Snd Lvl	60.4	8.5	5	3.5
R2	36	1	69.0	68.7	66	-0.3	11	Snd Lvl	59.9	8.8	5	3.8
R2A	37	1	68.0	66.8	66	-1.2	11	Snd Lvl	59.2	7.6	5	2.6
R2B	38	1	68.0	65.7	66	-2.3	11	----	58.8	6.9	5	1.9
R3	39	1	68.0	65.2	66	-2.8	11	----	58.5	6.7	5	1.7
R3A	40	1	68.0	65.5	66	-2.5	11	----	58.8	6.7	5	1.7
R3B	41	1	68.0	67.1	66	-0.9	11	Snd Lvl	59.5	7.6	5	2.6
R4	42	1	69.0	69.4	66	0.4	11	Snd Lvl	60.3	9.1	5	4.1
R-b18	43	1	69.0	70.0	66	1.0	11	Snd Lvl	60.5	9.5	5	4.5
R-b19	44	1	68.0	70.1	66	2.1	11	Snd Lvl	60.5	9.6	5	4.6
R5	45	1	68.0	70.1	66	2.1	11	Snd Lvl	60.5	9.6	5	4.6
R-b21	46	1	68.0	69.3	66	1.3	11	Snd Lvl	60.2	9.1	5	4.1
R-b22	47	1	69.0	69.1	66	0.1	11	Snd Lvl	60.2	8.9	5	3.9
R6	48	1	69.0	70.0	66	1.0	11	Snd Lvl	60.5	9.5	5	4.5
R-b24	49	1	69.0	68.7	66	-0.3	11	Snd Lvl	60.1	8.6	5	3.6

R-b25	50	1	69.0	69.5	66	0.5	11	Snd Lvl	60.6	8.9	5	3.9
R-b26	51	1	69.0	70.0	66	1.0	11	Snd Lvl	60.5	9.5	5	4.5
R-b27	52	1	68.0	69.3	66	1.3	11	Snd Lvl	60.6	8.7	5	3.7
R-b28	53	1	68.0	68.6	66	0.6	11	Snd Lvl	60.6	8.0	5	3.0
R-b29	54	1	68.0	68.0	66	0.0	11	Snd Lvl	60.7	7.3	5	2.3
R6A	55	1	68.0	68.6	66	0.6	11	Snd Lvl	61.2	7.4	5	2.4
R-b31	56	1	68.0	68.7	66	0.7	11	Snd Lvl	60.8	7.9	5	2.9
R-b32	57	1	68.0	68.1	66	0.1	11	Snd Lvl	61.6	6.5	5	1.5
R-b33	58	1	69.0	68.6	66	-0.4	11	Snd Lvl	61.3	7.3	5	2.3
R6B	59	1	69.0	69.3	66	0.3	11	Snd Lvl	63.3	6.0	5	1.0

Dwelling Units		**# DUs**	**Noise Reduction**		
			Min	**Avg**	**Max**
			dB	**dB**	**dB**
All Selected		34	4.1	8.1	9.6
All Impacted		31	4.1	8.2	9.6
All that meet NR Goal		32	6.0	8.3	9.6

Freese and Nichols **18 July 2019**
BSH/RAD **TNM 2.5**

RESULTS: BARRIER DESCRIPTIONS
PROJECT/CONTRACT: **HUC17463/1.5 FM 2642**
RUN: **Proposed Barrier 1 FM2642**
BARRIER DESIGN: **INPUT HEIGHTS**

Barriers

Name	Type	Heights along Barrier			Length	If Wall	If Berm			Cost
		Min	Avg	Max		Area	Volume	Top Width	Run:Rise	
		ft	ft	ft	ft	sq ft	cu yd	ft	ft:ft	$
North Barrier	W	6.00	6.00	6.00	498	2988				0
Center Barrier	W	6.00	6.00	6.00	880	5278				0
South Barrier	W	6.00	6.00	6.00	1283	7697				0
Prop Barrier Seg 1	W	8.00	8.00	8.00	2145	17159				308866
Prop Barrier Seg 2	W	8.00	8.00	8.00	74	589				10604
									Total Cost:	319470

Traffic Analysis for Highway Design

Texas Department of Transportation

MEMO

March 8, 2019

To: Noel S Paramanantham, P.E., District Engineer
Attn: Daniel J. Perry, P.E., Director of TPD

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

From: Farideh Dassi
Planner, TPP

Subject: Traffic Data
CSJ: 2658-01-013
FM 35:
From FM 2453
To County Road 2595
Hunt County

RECEIVED
MAR 0 7 2019
TXDOT
PARIS DISTRICT

Attached are tabulations showing traffic analysis for highway design for the 2026 to 2046 twenty year period and the 2026 to 2056 thirty year period for the described limits of the route. Also, included is a tabulation showing data for use in air and noise analysis.

Please refer to your original memorandum dated January 29, 2019.

If you have any questions or need additional information, please contact Farideh Dassi at (512) 467-3944.

Attachment

CC: Julie Rook, P.E., Transportation Engineer Supvr., Paris District
Nancy Peron, P.E., Transportation Engineer, Paris District
Design Division

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Paris District

March 5, 2019

Description of Location	Average Daily Traffic 2026	Average Daily Traffic 2046	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 (2026 to 2046) Flexible Pavement	S N	Rigid Pavement	SLAB
FM 35 From FM 2453 To County Road 2595 Hunt County	12,800	16,800	52 - 48	10.0	2.8	2.1	10,700	40	999,000	3	1,208,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	97.2	97.9
Medium Duty	1.7	1.3
Heavy Duty	1.1	0.8

Description of Location	Average Daily Traffic 2026	Average Daily Traffic 2056	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 (2026 to 2056) Flexible Pavement	S N	Rigid Pavement	SLAB
FM 35 From FM 2453 To County Road 2595 Hunt County	12,800	18,700	52 - 48	10.0	2.8	2.1	10,800	40	1,595,000	3	1,928,000	8"

Texas Department of Transportation

MEMO

December 29, 2017

To: Noel Paramanantham, P.E., District Engineer
Attention: Rick Mackey, P.E., Director of TPD

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

From: Bruce R. Uphaus
Transportation Analyst, TPP

Subject: Traffic Data
CSJ: 2658-01-013
FM 2642:
From FM 35
To SH 66

Hunt County

Attached is a tabulation showing traffic analysis for highway design for the 2026 to 2046 twenty year and 2026 to 2056 thirty year design 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 August 16, 2017.

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

Attachment

CC: Wade Blackmon, P.E., Transportation Engineer, Paris District
Design Division

TRAFFIC ANALYSIS FOR HIGHWAY DESIGN

Paris District

December 19, 2017

Description of Location	Average Daily Traffic 2026	Average Daily Traffic 2046	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 (2026 to 2046) Flexible Pavement	S N	Rigid Pavement	SLAB
FM 2642 From FM 35 To SH 66 Hunt County	6,000	8,500	62 - 38	10.1	8.1	6.1	11,000	30	1,894,000	3	2,242,000	8"

Data for Use in Air & Noise Analysis

Vehicle Class	Base Year % of ADT	Base Year % of DHV
Light Duty	91.9	93.9
Medium Duty	2.6	2.0
Heavy Duty	5.5	4.1

Description of Location	Average Daily Traffic 2026	Average Daily Traffic 2056	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 (2026 to 2056) Flexible Pavement	S N	Rigid Pavement	SLAB
FM 2642 From FM 35 To SH 66 Hunt County	6,000	9,400	62 - 38	10.1	8.1	6.1	11,100	30	3,017,000	3	3,572,000	8"