

Knik-Goose Bay Road Reconstruction Project

Centaur Avenue to Vine Road

Traffic Noise Analysis Report

Project No.: STP-0525(16)/52464

STATE OF ALASKA

Department of Transportation and Public Facilities

Central Region Division of Design and Construction

Preliminary Design and Environmental Section

April 2015

TABLE OF CONTENTS

SUMMARY	1
PROJECT BACKGROUND	1
PURPOSE OF STUDY	4
METHODS OF NOISE MODEL USE AND VALIDATION PROCESS	4
DESCRIPTION OF LAND USE CATEGORIES ALONG THE CORRIDOR.....	5
RESULTS	6
IDENTIFICATION OF NOISE IMPACTS	7
NOISE ABATEMENT ANALYSIS.....	8
ABATEMENT RECOMMENDATIONS	12
STATEMENT OF LIKELIHOOD.....	12
CONSTRUCTION NOISE	12
CONCLUSION.....	12
REFERENCES.....	21

TABLES

Table 1 Comparison of Measured and Predicted Traffic Noise Levels.....	4
Table 2 KGB Road Existing and Future Traffic Count Inputs	5
Table 3 Predicted Existing, Build, and No-Build Noise Levels	6
Table 4 Distances from the ROW Line to NAC Levels in Undeveloped Areas	7
Table 5 4 and 6-Lane Preferred Alternative – Summary of Barrier Heights and Noise Reduction	9
Table 6 Noise Barrier Cost Analysis (5 dBA Noise Level Reduction).....	10
Table 7 Noise Barrier Cost Analysis (7 dBA Noise Level Reduction).....	11

FIGURES

Figure 1 Project Location.....	2
Figure 2 Typical Sections	3
Figure 3.1 Project Map (1 of 7)	14
Figure 3.2 Project Map (2 of 7)	15
Figure 3.3 Project Map (3 of 7)	16
Figure 3.4 Project Map (4 of 7)	17
Figure 3.5 Project Map (5 of 7)	18
Figure 3.6 Project Map (6 of 7)	19
Figure 3.7 Project Map (7 of 7)	20

APPENDICES

Appendix A Existing Noise Level Worksheets	
Appendix B TNM Output Tables	
Appendix C Noise Abatement Recommendation Worksheets	
Appendix D DOT&PF Noise Policy	

SUMMARY

This traffic noise analysis was conducted for the proposed federally-funded Knik-Goose Bay (KGB) Road Reconstruction project. The preferred alternative would widen KGB Road from two to six lanes between Palmer Wasilla Highway and Mack Road and from two to four lanes between Mack Road and Vine Road (Figures 1 and 2). The project segments from Centaur Avenue to Palmer Wasilla Highway and just south of Vine Road would be used as transition areas to taper from the upgraded section of the highway to the existing two-lane section. The study area for this noise analysis includes the KGB Road between Centaur Avenue and immediately south of Vine road, extending up to 450 feet on either side of the road (see Figures 3.1-3.7 at the end of the report for a detailed project map). The project would build a 30-foot non-traversable median, adjust the roadway geometry to meet current design standards, and realign several intersections. Construction of this project would occur in 2018-2019, with a design year of 2039.

The traffic noise analysis was conducted in accordance with the *Alaska Department of Transportation & Public Facilities (DOT&PF) Noise Policy, 2011*. The analysis determined that 58 noise sensitive receivers will experience noise impacts by the design year as a result of the proposed project. Noise abatement in the form of noise barriers was evaluated for the impacted properties. Noise barriers included in the project must be found feasible and reasonable to be included in the project; this analysis found barriers to be both feasible and reasonable in three locations.

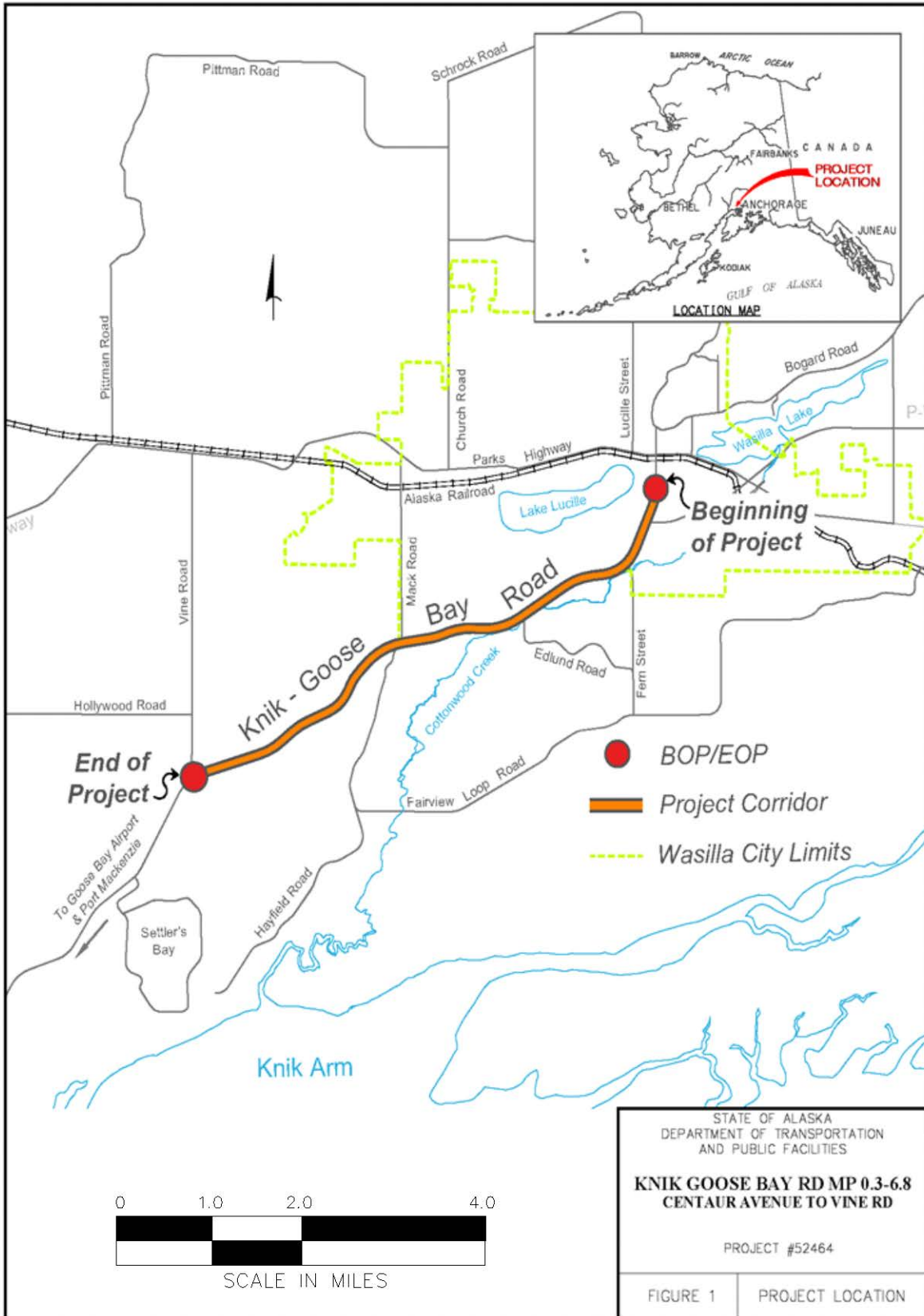
PROJECT BACKGROUND

KGB Road is currently a two-lane facility with auxiliary lanes at Palmer-Wasilla Highway, Edlund Road, Fairview Loop Road, Clapp Street, and Vine Road intersections. Lanes are 12 feet wide with four to six-foot shoulders (Figure 2). A separated, paved pathway runs along the north side of the road. The alignment has numerous horizontal curves, and vertical curves generally conform to the rolling terrain. Intersections at Palmer-Wasilla Highway, Fairview Loop Road, Fern Street, and Vine Road are signalized; all other approach intersections are two-way stop sign controlled. Adjacent land is developed with private residences, churches, commercial properties and a baseball complex. Commercial development is primarily concentrated between Centaur Avenue and Fern Street. Pockets of undeveloped land also exist along the project's length.

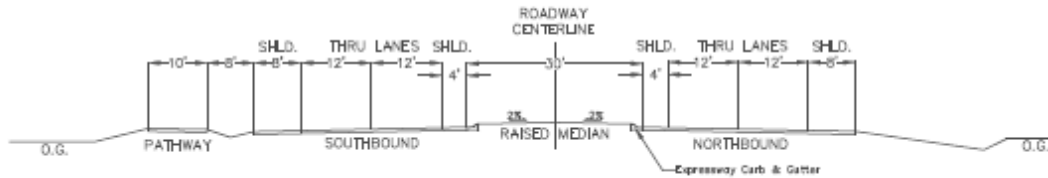
KGB Road was constructed on its current alignment in 1966 and has undergone several improvements since, including:

- Conversion from a gravel to asphalt driving surface and subsequent pavement rehabilitation
- Installation of signals and safety treatments at intersections
- Addition of a 10-foot wide separated, multi-use pathway

The purpose of improving KGB Road is to provide a safe roadway that accommodates 2039 traffic levels and to provide multi-use trails for pedestrian and other non-motorized traffic. Future traffic levels merit a larger facility with additional travel lanes and auxiliary turn lanes at intersections, and a center median would provide for both greater safety and operational capacity. The construction of additional through lanes qualifies this as a Type 1 project. The reconstruction project would also improve pavement, drainage, and structural integrity of the roadway, and driver line-of-sight would be increased by widening shoulders and flattening and clearing side slopes.

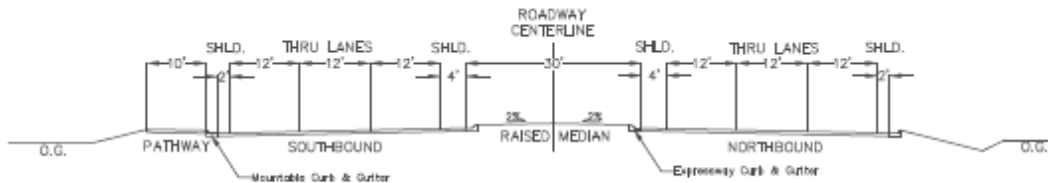


CENTAUR AVENUE TO MACK ROAD



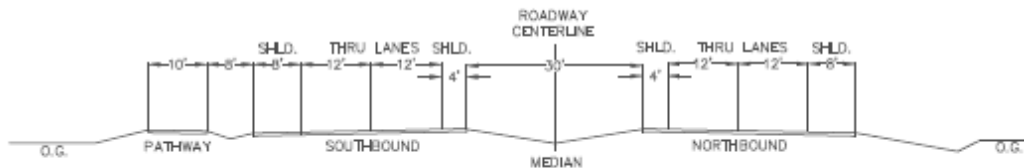
**4-LANE URBAN SECTION
RAISED MEDIAN AND SEPARATED MULTI-USE PATHWAY
(INITIAL CONSTRUCTION)**

PALMER-WASILLA HIGHWAY TO MACK ROAD



**6-LANE URBAN SECTION
RAISED MEDIAN WITH MULTI-USE PATHWAY BEHIND CURB
(FULL BUILD-OUT)**

MACK ROAD TO VINE ROAD



**4-LANE RURAL SECTION
DEPRESSED GRASS MEDIAN AND SEPARATED MULTI-USE PATHWAY**

STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES	
KNIK-GOOSE BAY ROAD RECONSTRUCTION PROJECT NO. 52464	
TYPICAL SECTIONS	FIGURE 2.1

PURPOSE OF STUDY

The purpose of this traffic noise study is (1) to determine if project-related noise impacts will occur and (2) to determine whether noise abatement measures would be warranted based on Federal Highway Administration (FHWA) criteria and the 2011 DOT&PF Noise Policy (Policy).

METHODS OF NOISE MODEL USE AND VALIDATION PROCESS

The 2011 *United States Department of Transportation Highway Traffic Noise: Analysis and Abatement Guidance* and 23 CFR 772.9 require using the most recent version of the FHWA Traffic Noise Model (TNM Version 2.5) software or any other model determined by FHWA to be consistent with the methodology of TNM. TNM version 2.5 was used for this analysis. To gain an acceptable level of confidence in TNM 2.5, 23 CFR 772.11(d)(2) requires TNM 2.5 be validated by comparing field measurements to predicted sound measurements generated from the model. The model is considered valid and in need of no adjustment if its predictions vary no more than 3dBA from observed measurements.

The inputs utilized in this noise model include ground types, roadway geometrics, location and elevation data for receivers and barriers, and traffic volumes, types, and speeds. In order to deliver higher accuracy to the model, adjustments were made to the ground types in two areas of the model. Measurements that were taken above iced covered parking lots were modeled as hard ground. With these settings, the model was validated using existing field measurements.

Measurement equipment used for this study consisted of a Larson-Davis Model 820 Noise Meter calibrated with a Larson-Davis Model CAL200-0787 precision calibrator; both meet the requirements of the American National Standards Institute (ANSI) and the International Electrotechnical Commission (IEC) for precision sound level measurement instrumentation.

As directed by the Policy, primary consideration was given to monitoring locations that reflect exterior areas of frequent human use at the first row of structures. Locations were selected using aerial imagery to identify areas of frequent human use, common activities in the area, and terrain in the area of the monitoring. If no permission to enter the property was granted, neighboring properties were selected as an alternative or a location within the right-of-way was selected for validation purposes only. All monitor locations were also used as receiver locations for the noise analysis.

Traffic noise level measurements, concurrent traffic counts, weather observations, surrounding influences, and monitoring station coordinates were collected at eleven locations along the project corridor on October 2-3, 2014 (Existing Noise Level Worksheets, Appendix A). Table 1 provides a summary of these noise measurements compared to the TNM 2.5 predicted levels.

Table 1: Comparison of Measured and Predicted Traffic Noise Levels

Monitor ¹	Location	Receiver or Validation	Ground Type	Measured L _{eq} (dBA) ²	Predicted L _{eq} (dBA) ³	Difference (dBA)
M1 – Wasilla Senior Campus	N 61.5692, W 149.4469	Both (R4)	Grass	61.4	64.0	2.6
M2 – Coffee hut near Surface Works Countertops	N 61.5628, W 149.4574	Both (R7)	Grass	71.0	68.1	2.9

M3 – Smith baseball fields	N 61.5616, W 149.4735	Both (R9)	Hard Soil	59.3	60.9	1.6
M4 – Wasilla Christian Church	N 61.5579, W 149.4818	Both (R11)	Hard Soil	65.6	64.9	0.7
M5 – 1671 Harvest Loop	N 61.5552, W 149.4987	Both (R15)	Grass	61.9	62.4	0.5
M6 – 2856 W. Stonebluff Drive	N 61.5523, W 149.5222	Both (R18)	Grass	60.2	61.3	1.1
M7 – Christ First United Methodist Church	N 61.5510, W 149.5319	Both (R22)	Grass	59.8	59.6	0.2
M8 – 2001 Caryshea Street	N 61.5483, W 149.5420	Both (R26)	Grass	62.5	64.2	1.7
M9 – 4891 W Reliance Road	N 61.5380, W 149.5726	Both (R36)	Grass	64.2	63.8	0.4
M10 – 4121 Harbor View Drive	N 61.5342, W 149.5950	Both (R41)	Grass	65.0	65.5	0.5

¹ See Figures 3.1-3.7 for a map of monitor locations.

² Existing noise level worksheets are provided in Appendix A

³ TNM 2.5 inputs and outputs are provided in Appendix C

As shown in Table 1, the predicted values are within 3dBA of the measured values and TNM 2.5 may be used to accurately calculate the traffic noise exposure for existing (2012) and design year (2039) conditions.

Existing traffic counts are based on data collected by DOT&PF in 2012, and future traffic counts were extrapolated using growth rates from the Parks Highway alternate corridor (PHAC) model and utilizing the design hourly volume of 11.6% provided by CR Highway Data. Existing and design year traffic count inputs are displayed in Table 2.

Table 2: KGB Road Existing and Future Traffic Count Inputs

	Year	Auto	Med Truck	Heavy Truck	Bus	Motorcycle	Speed
Centaur Ave to Palmer-Wasilla Hwy	Existing	666	31	6	0	2	45 MPH
	Design	2585	119	25	2	7	
Palmer-Wasilla Hwy to Fern St	Existing	2102	96	20	2	5	55 MPH
	Design	4282	196	41	3	11	
Fern St to Edlund Rd	Existing	2090	96	20	2	5	55 MPH
	Design	5752	264	55	4	15	
Edlund Rd to Mack Rd	Existing	1670	77	16	1	4	55 MPH
	Design	4791	220	46	4	12	
Mack Rd to Fairview Lp	Existing	1725	79	16	1	4	55 MPH
	Design	4758	218	45	4	12	
Fairview Lp to Vine Rd	Existing	1560	72	15	1	4	55 MPH
	Design	5322	244	51	4	14	

DESCRIPTION OF LAND USE CATEGORIES ALONG THE CORRIDOR

The FHWA has established noise abatement criteria (NAC) for specific land use categories to evaluate noise impacts from transportation projects. This information is provided in the Policy (Appendix D). The FHWA NACs are measured in A-weighted decibels (dBA), which is sound perceptible to the human ear. They are expressed as the level of sound energy produced over a one-hour period Leq-h (dBA), or the hourly equivalent sound level. Noise-sensitive properties neighboring KGB Road consist of residential,

recreational, medical, churches, and businesses, and fit into land use categories B, C, and E. Hourly equivalent sound levels to define noise impacts for these are 67dBA, 67dBA, and 72dBA, respectively. Land use categories F and G also exist along the project corridor, but abatement is not required for these land uses. Land use category D is present along the corridor as well, but not addressed in this report, as “an indoor analysis shall only be done after exhausting all reasonable outdoor analysis options,” (Policy p. 12) and all noise-sensitive properties were able to be analyzed for exterior land uses.

Twenty-seven residences, eleven businesses, two senior campuses, a daycare/school, a baseball complex, and three churches were selected as receivers, which can model one or more receptors (Table 3, Figures 3.1-3.7). According to the Policy, receivers “should be located in areas that receive frequent human use (i.e. patios, balconies, playgrounds, gardens, etc.)” or “a location that is representative of the exterior area that receives the most frequent use” (Policy pg. 11-12). All receptors for this study were located according to this criterion.

According to 23 CFR 772.5 a traffic noise impact occurs when a predicted noise level approaches or exceeds the NAC established for a receptor’s land use category or substantially exceeds existing noise levels. The Policy defines “approach” as noise levels within 1dBA of the NAC and a substantial increase as 15dBA or higher. Therefore the adjusted NAC are 66 dBA for categories B and C and 71 dBA for category E.

RESULTS

Receiver coordinates were entered into TNM 2.5 to model traffic noise levels for KGB Road. Existing (2012) and design year (2039) no-build and build condition noise levels were calculated using TNM 2.5. Table 3 presents the modeled existing and predicted sound levels and whether the change in noise levels constitutes a noise impact (model output tables are included in Appendix B). Receiver locations are shown on Figures 3.1-3.7.

Table 3: Predicted Existing, Build, and No-Build Noise Levels

Receptor	Activity Category	Land Use Description	NAC (dBA)*	Existing (2012) (dBA)	No Build (2039) (dBA)	No Build Change (dBA)	Build (2039) (dBA)	Build Change (2039) (dBA)
R1	E	Business	71	63	69	6	68	5
R2	E	Business	71	60	65	5	66	6
R3	E	Business	71	65	69	4	72	7
R4	B	Residence	66	59	64	5	66	7
R5	B	Residence	66	60	69	9	71	11
R6	B	Residence	66	65	70	5	72	7
R7	E	Business	71	70	75	5	74	4
R8	E	Business	71	71	75	4	76	5
R9	C	Baseball Fields	66	65	73	8	69	4
R10	B	Residence	66	69	73	4	73	4
R11	C	Church	66	67	72	5	73	6
R12	E	Business	71	66	71	5	70	4
R13	B	Residence	66	65	70	5	72	7
R14	B	Residence	66	62	73	11	68	6
R15	B	Residence	66	51	72	21	72	21

R16	E	Business	71	54	70	16	71	17
R17	E	Business	71	64	68	4	69	5
R18	B	Residence	66	63	67	4	68	5
R19	B	Residence	66	66	71	5	72	6
R20	B	Residence	66	68	72	4	73	5
R21	B	Residence	66	65	72	7	72	7
R22	C	Church	66	56	66	10	66	10
R23	E	Business	71	57	74	17	73	16
R24	B	Residence	66	65	72	7	72	7
R25	B	Residence	66	63	69	6	69	6
R26	B	Residence	66	64	70	6	70	6
R27	B	Residence	66	66	72	6	72	6
R28	B	Residence	66	64	71	7	71	7
R29	B	Residence	66	66	73	7	73	7
R30	B	Residence	66	64	70	6	71	7
R31	C	Church	66	64	70	6	70	6
R32	B	Residence	66	64	70	6	70	6
R33	B	Residence	66	64	71	7	71	7
R34	B	Residence	66	63	72	9	72	9
R35	E	Business	71	66	71	5	71	5
R36	B	Residence	66	65	71	6	71	6
R37	B	Residence	66	68	74	6	75	7
R38	B	Residence	66	65	71	6	71	6
R39	B	Residence	66	66	71	5	71	5
R40	B	Residence	66	63	70	7	71	8
R41	C	School/Daycare	66	67	73	6	73	5
R42	B	Residence	66	61	71	10	71	10
R43	B	Residence	66	60	72	12	72	12
R44	B	Residence	66	57	66	9	65	8
R45	E	Business	71	65	72	7	73	8
R46	B	Residence	66	59	-	-	71	12
R47	B	Residence	66	70	-	-	70	0
R48	B	Residence	66	71	-	-	72	1
R49	C	Baseball Fields	66	65	-	-	67	2
R50	B	Residence	66	62	-	-	71	9
R51	B	Residence	66	62	-	-	64	2
R52	B	Residence	66	51	-	-	68	17
R53	B	Residence	66	64	-	-	66	2
R54	B	Residence	66	63	-	-	70	7
R55	B	Residence	66	66	-	-	70	4
R56	B	Residence	66	66	-	-	69	3
R57	B	Residence	66	64	-	-	69	5
R58	B	Residence	66	64	-	-	67	3
R59	B	Residence	66	66	-	-	70	4
R60	B	Residence	66	64	-	-	68	4
R61	B	Residence	66	63	-	-	66	3
R62	B	Residence	66	66	-	-	69	3
R63	B	Residence	66	66	-	-	69	3
R64	B	Residence	66	65	-	-	70	5

Red text indicates a noise impact

R46-R64 No Build conditions not modeled

*As modified by DOT&PF

The Policy requires estimation of future noise levels for undeveloped properties (category G). Thirteen undeveloped areas, referenced as UA# on Figures 3.2-3.7, were identified adjacent to the proposed project and for which noise levels were estimated. The undeveloped lots located between developed properties along the project corridor were not analyzed using TNM; however, the design year noise levels for these lots are represented by the modeled sound levels of neighboring properties. Table 4 presents the approximate distance from the proposed ROW line to the NAC for activity categories B, C, and E. These distances are for informational purposes only and noise abatement is not recommended.

Table 4: Distances from the ROW Line to NAC Levels in Undeveloped Areas

		Undeveloped Area												
		UA 1	UA 2	UA 3	UA 4	UA 5	UA 6	UA 7	UA 8	UA 9	UA 10	UA 11	UA 12	UA 13
Distance from ROW	≤71 dBA (Cat. E)	100	150	180	140	110	100	90	100	110	110	90	120	110
Line to NAC (ft)	≤66 dBA (Cat. B&C)	330	430	530	450	330	330	320	330	340	350	280	360	340

IDENTIFICATION OF NOISE IMPACTS

Results of the noise level modeling show that 58 receptors will approach or exceed their applicable NAC by the design year. The only receivers not exceeding these criteria are R1, R2, R12, R17, R44, and R51. As shown in Table 3, three (R15, R16, and R23) of the predicted noise increases for the proposed action are equal to or greater than 15dBA. The worst-case noise increase for the project is 21dBA.

NOISE ABATEMENT ANALYSIS

In accordance with 23 CFR 772.13(a), noise abatement measures must be considered in the vicinity of those receivers where noise impacts are predicted to occur. Abatement measures are evaluated for feasibility and reasonableness in order to determine whether or not they’re incorporated into the project. The following noise abatement measures were considered for incorporation into the project to reduce traffic noise impacts:

- Construction of noise barriers (including land rights acquisition)
- Traffic management measures (e.g. time-use restrictions for certain vehicle types, modified speed limits, exclusive lane designations)
- Alteration of horizontal and vertical alignments
- Acquisition of real property or predominantly unimproved property

For KGB Road, the construction of noise barriers is the most cost effective option due to the level of property development in the area. A realignment of the roadway to avoid noise impacts would incur substantial property acquisition and raise the cost per benefitted receptor to an unreasonable level. Similarly, the acquisition of real or predominantly unimproved property to serve as a noise buffer would make the cost unreasonable. Traffic management measures may help reduce the volume of traffic on the road, thus potentially reducing noise levels, but these alone would not further the project purpose and need.

The construction of noise barriers is considered feasible if:

1. A minimum of 5dBA or more reduction is achieved for at least 50% of front row dwelling units.
2. They don't create a safety hazard to the driving public.

The construction of noise barriers is considered reasonable if:

1. They are cost effective, having a cost per benefitted receptor of less than or equal to \$32,000, adjusted for inflation (inflation calculations included below).
2. They have greater than 60% approval from property owners and affected residents.
3. A DOT&PF design goal of 7dBA reduction can be achieved for 50% of benefitted receptors in the first row of structures.

FHWA's National Highway Construction Cost Index (NHCCI) was used to determine the cost increase due to inflation from 2009 to 2014 (the most recent year with available data). According to the NHCCI, the average cost index for 2009 was 1.0970, and the average index for 2014 was 1.1103; therefore the cost increase ratio due to inflation from 2009 to 2014 is $1.1103/1.0970 = 1.0121$. This yields an inflation-adjusted price per benefitted receptor of $\$32,000 * 1.0121 = \$32,387$.

For purposes of analyzing the feasibility and reasonableness of noise barriers, 19 supplemental receivers (R46-R64) were added to the model in areas that were found to have impacts. With the exception of R51, all supplemental receivers exceeded the NAC in the 2039 model. While these receivers were not included in the modeling of existing condition, their proximity to modeled receivers allows for an assumption of corresponding existing conditions. From the model, 18 of the additional receivers are shown to experience noise impacts by the 2039 design year.

Acoustic Feasibility Analysis

TNM 2.5 was used to analyze the predicted noise level reduction (NLR) for barriers of increasing heights until 5dBA and 7dBA NLR's were achieved. The analysis found that noise barriers could be constructed that meet the DOT&PF feasibility criterion of 5dBA and reasonableness criterion of 7dBA NLR. The maximum barrier height analyzed was 15 feet. On a case by case basis, the study showed that barriers taller than 15 feet did not meet the economic reasonableness standards for the number of residential receivers in each area. Table 4 shows the resulting NLR for 5-10 foot, 12-foot, and 15-foot high noise barriers at each impacted property along the project's length. A 5 dBA NLR corresponds with yellow shading, and a 7dBA NLR with green.

Table 5: 4 and 6-Lane Preferred Alternative - Summary of Barrier Heights and Noise Reduction

Barrier No.	Benefitted Receiver	Noise Barrier Height																Height for ≥50% 5dBA NLR?	Height for ≥50% 7dBA NLR?		
		0'		5'		6'		7'		8'		9'		10'		12'				15'	
		NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)			NL (dBA)	NLR (dBA)
B1*	R4	72	65	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	5
	R46	71	67	4	65	6	64	7	-	-	-	-	-	-	-	-	-	-	-	6	7
B2	R3	72	70	2	69	3	66	6	66	6	65	7	-	-	-	-	-	-	-	7	9
B3	R5	71	66	5	66	5	66	5	65	6	65	6	65	6	65	6	65	6	65	5	>15
B4	R6	72	72	0	70	2	69	3	67	5	67	5	67	5	66	6	65	7	8	8	15
B5	R47	70	69	1	68	2	67	3	66	4	66	4	66	4	65	5	65	5	12	12	>15
B6	R7	74	66	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	<5	5
B7	R8	76	73	3	70	6	67	9	-	-	-	-	-	-	-	-	-	-	6	6	7
B8	R48	72	72	0	71	1	71	1	69	3	68	4	67	5	66	6	65	7	10	10	15
B9	R9	69	65	4	65	4	64	5	64	5	64	5	63	6	63	6	63	6	7	7	>15
	R49	67	66	1	65	2	65	2	65	2	65	2	65	2	64	3	64	3	>15	>15	>15
B10	R10	73	73	0	74	-1	72	1	72	1	71	2	69	4	68	5	67	6	12	12	>15
B11	R11	73	69	4	68	5	67	6	67	6	67	6	66	7	-	-	-	-	6	6	10
B12	R14	68	62	6	61	7	-	-	-	-	-	-	-	-	-	-	-	-	5	5	6
	R50	71	70	1	68	3	68	3	67	4	67	4	66	5	65	6	64	7	10	10	15
B13	R13	70	69	1	68	2	68	2	67	3	67	3	67	3	66	4	66	4	>15	>15	>15
	R15	72	67	5	66	6	65	7	-	-	-	-	-	-	-	-	-	-	5	5	7
	R51	64	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA	NA
	R52	68	64	4	64	4	63	5	62	6	61	7	-	-	-	-	-	-	7	7	9
B14	R16	71	69	2	68	3	67	4	65	6	65	6	64	7	-	-	-	-	8	8	10
B15	R18	68	66	2	66	2	65	3	63	5	62	6	62	6	61	7	-	-	8	8	12
	R53	66	64	2	64	2	63	3	63	3	63	3	62	4	62	4	62	4	>15	>15	>15
	R54	70	67	3	66	4	64	6	63	7	-	-	-	-	-	-	-	-	7	7	8
B16	R19	72	69	3	67	5	65	7	-	-	-	-	-	-	-	-	-	-	6	6	7
	R55	70	66	4	64	6	64	6	63	7	-	-	-	-	-	-	-	-	6	6	8
	R56	69	69	0	69	0	69	0	68	1	68	1	67	2	65	4	62	7	13	13	15
B17	R20	73	73	0	73	0	71	2	70	3	69	4	68	5	67	6	66	7	10	10	15
	R21	72	72	0	72	0	70	2	69	3	67	5	65	7	-	-	-	-	9	9	10
B18	R22	66	66	0	66	0	65	1	65	1	65	1	65	1	64	2	63	3	>15	>15	>15
B19	R23	73	71	2	71	2	71	2	70	3	70	3	70	3	70	3	70	3	>15	>15	>15
B20	R24	72	69	3	67	5	67	5	66	6	66	6	65	7	-	-	-	-	6	6	10
B21	R25	69	66	3	65	4	65	4	64	5	64	5	64	5	63	6	63	6	8	8	>15
	R27	69	63	6	62	7	-	-	-	-	-	-	-	-	-	-	-	-	5	5	6
	R30	69	65	4	64	5	63	6	63	6	62	7	-	-	-	-	-	-	6	6	9

		Noise Barrier Height															Height for	Height for				
Barrier No.	Benefitted Receiver	0'		5'		6'		7'		8'		9'		10'		12'		15'		≥50% 5dBA NLR?	≥50% 7dBA NLR?	
		NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)	NL (dBA)	NLR (dBA)			
	R58	67	63	4	62	5	61	6	61	6	60	7	-	-	-	-	-	-	-	6	9	
B22	R26	69	66	3	65	4	65	4	65	4	64	5	64	5	64	5	64	5	64	5	9	>15
B23	R28	69	66	3	65	4	64	5	64	5	64	5	63	6	63	6	62	7	62	7	7	15
	R57	69	65	4	64	5	64	5	63	6	63	6	63	6	62	7	-	-	-	-	6	12
B24	R29	73	70	3	68	5	66	7	-	-	-	-	-	-	-	-	-	-	-	-	6	7
	R32	70	70	0	69	1	69	1	68	2	66	4	65	5	63	7	-	-	-	-	10	12
	R33	68	66	2	65	3	65	3	65	3	65	3	65	3	65	3	64	4	64	4	>15	>15
	R59	70	68	2	67	3	66	4	66	4	65	5	64	6	64	6	63	7	63	7	9	15
	R60	68	66	2	65	3	64	4	64	4	63	5	63	5	63	5	62	6	62	6	9	>15
B25	R31	70	69	1	68	2	67	3	66	4	65	5	65	5	64	6	63	7	63	7	9	15
B26	R34	66	63	3	63	3	63	3	62	4	62	4	62	4	62	4	61	5	61	5	15	>15
	R61	69	64	5	64	5	63	6	63	6	62	7	-	-	-	-	-	-	-	-	5	9
B27	R35	71	68	3	67	4	66	5	66	5	66	5	66	5	65	6	65	6	65	6	7	>15
B28	R36	71	67	4	66	5	65	6	65	6	64	7	-	-	-	-	-	-	-	-	6	9
	R38	70	65	5	64	6	64	6	63	7	-	-	-	-	-	-	-	-	-	-	5	8
B29	R37	75	67	8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	5
B30	R62	69	69	0	69	0	68	1	67	2	67	2	66	3	64	5	63	6	63	6	12	>15
	R63	69	69	0	69	0	69	0	67	2	67	2	66	3	64	5	62	7	62	7	12	15
RW	R39*	71	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	NA	NA
B31	R40	68	68	0	66	2	66	2	65	3	63	5	63	5	62	6	60	8	60	8	9	15
	R43	71	67	4	66	5	66	5	65	6	64	7	-	-	-	-	-	-	-	-	6	9
	R64	70	65	5	65	5	64	6	64	6	63	7	-	-	-	-	-	-	-	-	5	9
B32	R41	73	66	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	<5	5
B33	R42	70	65	5	65	5	64	6	64	6	64	6	63	7	-	-	-	-	-	-	5	10
B34	R45	72	68	4	68	4	67	5	67	5	67	5	66	6	66	6	66	6	66	6	7	>15

A 5 dBA NLR corresponds with yellow shading, and a 7dBA NLR with green.

*While receiver R39 was found to have noise impacts in the design year, it is located near a proposed retaining wall that would be installed as a component of this project (Figure 3.7). When the retaining wall is included in the model, no impact is present at that location.

Reasonableness Analysis

Barrier construction is deemed cost effective if the cost is equal to or less than \$32,387 per benefitted receptor. If that cost threshold is exceeded, noise abatement would not be recommended. Tables 6 and 7 summarize the barrier cost analysis and show that barriers 1, 4, and 23 are economically reasonable while also achieving a 7dBA NLR.

Table 6: Noise Barrier Cost Analysis (5 dBA Noise Level Reduction)

Barrier No.	Height for ≥5dBA NLR?	Barrier Length (feet)	Barrier Area (sq. feet)	Barrier Cost* (\$)	Number of Benefitted Residences	Cost per Benefitted Residence (\$)	Economically Feasible?
B1	6	820	4920	295200	20	14760	Yes
B2	7	500	3500	210000	1	210000	No
B3	5	330	1650	99000	2	49500	No
B4	8	360	2880	172800	24	7200	Yes
B5	12	490	5880	352800	3	117600	No
B6	5	850	4250	255000	3	85000	No
B7	6	420	2520	151200	5	30240	Yes
B8	10	590	5900	354000	3	118000	No
B9	7	850	5950	357000	21**	17000	YES
B10	12	400	4800	288000	2	144000	No
B11	6	450	2700	162000	1	162000	No
B12	5	1040	5200	312000	2	156000	No
B13	7	2520	17640	1058400	12	88200	No
B14	8	1070	8560	513600	1	513600	No
B15	8	2180	17440	1046400	12	87200	No
B16	6	2370	14220	853200	6	142200	No
B17	9	1160	10440	626400	4	156600	No
B18	15	570	8550	513000	1	513000	No
B19	15	400	6000	360000	2	180000	No
B20	6	460	2760	165600	1	165600	No
B21	6	2830	16980	1018800	16	63675	No
B22	9	360	3240	194400	1	194400	No
B23	6	1090	6540	392400	32	12262.5	Yes
B24	9	3480	31320	1879200	14	134228.57	No
B25	9	700	6300	378000	1	378000	No
B26	15	580	8700	522000	2	261000	No
B27	7	340	2380	142800	1	142800	No
B28	6	1520	9120	547200	14	39085	No
B29	5	380	1900	114000	2	57000	No
B30	12	980	11760	705600	3	235200	No
B31	6	2150	12900	774000	10	77400	No
B32	5	400	2000	120000	1	120000	No
B33	5	750	3750	225000	2	112500	No
B34	7	200	1400	84000	1	84000	No

* A construction cost of \$60/sq. ft. was provided by the design engineer based on 2014 Seward Hwy sound barrier construction

** The area of the front row baseball fields is 252,000sqft. Dividing this area by the average plot size of 12000sqft, gives 21 benefited residence.

Table 7: Noise Barrier Cost Analysis (7 dBA Noise Level Reduction)

Barrier No.	Height for ≥7dBA NLR?	Barrier Length (feet)	Barrier Area (sq. feet)	Barrier Cost* (\$)	Number of Benefitted Residences	Cost per Benefitted Residence (\$)	Economically Reasonable?
B1	7	820	5740	344400	20	17220	Yes
B4	15	360	5400	324000	16	20250	Yes
B7	7	420	2940	176400	5	35280	No
B9	>15**	850	12750	765000	21	36430	No
B23	12	1090	13080	784800	32	24525	Yes

* A construction cost of \$60/sq. ft. was provided by the design engineer based on 2014 Seward Hwy barrier construction

** In order to meet the criteria a wall greater than 15 feet would be needed which would exceed cost allowances.

The DOT&PF must contact all benefitted households and property owners to determine the level of interest for a noise abatement measure. A minimum of 60% of households and property owners must want the noise abatement measure for it to be considered reasonable. Collection of this information will be done prior to finalizing the project design.

ABATEMENT RECOMMENDATIONS

Noise abatement recommendation worksheets for each affected receiver are provided in Appendix C. Pending approval of the noise barriers by at least 60% of the benefitted households and property owners, the following is recommended:

1. Barrier 1 – On east side of KGB Road, beginning south of the intersection with PWH and running south 850 feet (Figure 3.1). Proposed barrier height is 7 feet.
2. Barrier 4 – On east side of KGB Road, beginning north of the intersection with South Century Circle and running north 380 feet (Figure 3.1). Proposed barrier height is 15 feet.
3. Barrier 23 – On south side of KGB Road, beginning south of the intersection with Caryshea Street and running west for 1,000 feet. Proposed barrier height is 12 feet. (Figure 3.5)

STATEMENT OF LIKELIHOOD

As a result of the feasibility and reasonableness analysis conducted in support of this environmental document, the DOT&PF is proposing to incorporate three noise barriers into the proposed project. These noise abatement recommendations are preliminary and based upon the feasibility and reasonableness analysis completed at the time of the environmental document. Final recommendations for noise abatement will be based upon the feasibility and reasonableness analysis conducted during the detailed design of the project. Any changes in the final abatement recommendations will result in the reevaluation of the approved NEPA document and the solicitation of additional public comment.

CONSTRUCTION NOISE

During the construction phase of the proposed project, noise from construction activities would add to the noise environment in the immediate project area. For this project, equipment operating at the project site would conform to contractual specifications requiring the contractor to comply with all local sound control rules, regulations, and ordinances. Although construction noise impacts would be temporary, the following measures are recommended to minimize such impacts:

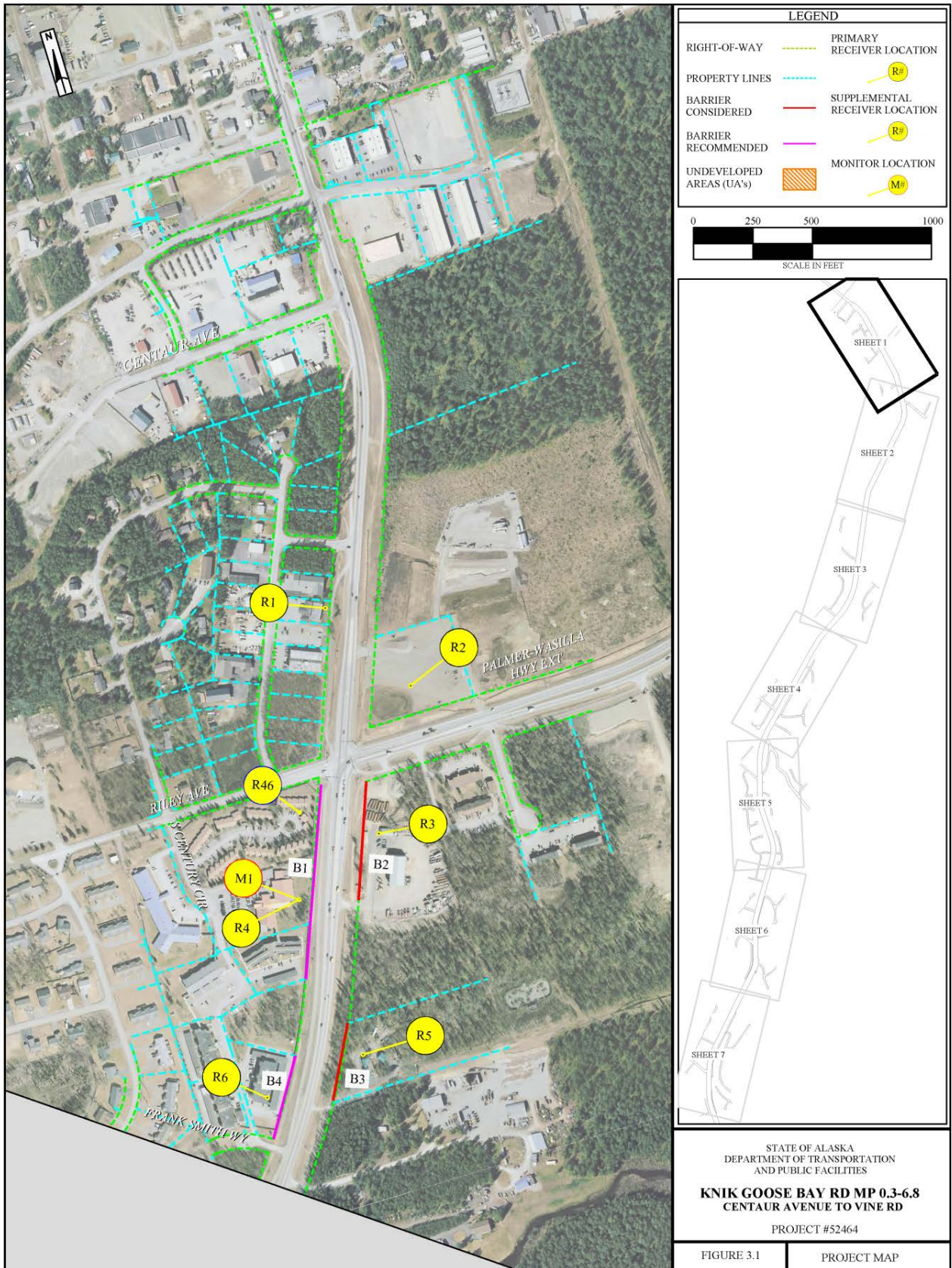
- Whenever possible, limit operations of heavy equipment and other noisy procedures to the daylight hours. The contractor must comply with local noise ordinances.
 - All reasonable efforts will be made to notify the public prior to conducting work at night or on weekends and holidays
- Install and maintain effective mufflers on equipment.
- Locate equipment and vehicle staging areas as far from residential areas as possible.
- Limit unnecessary idling of equipment.

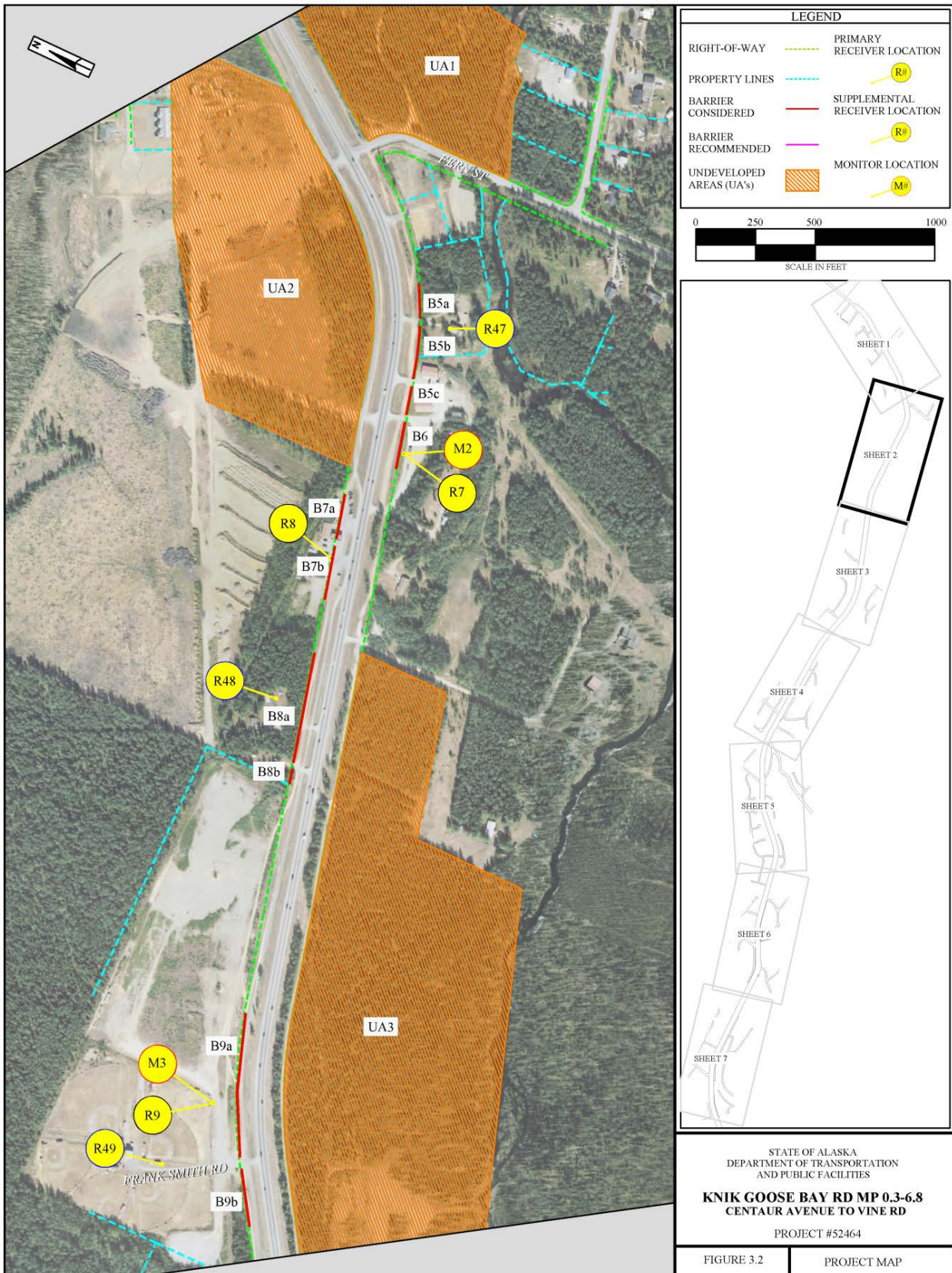
CONCLUSION

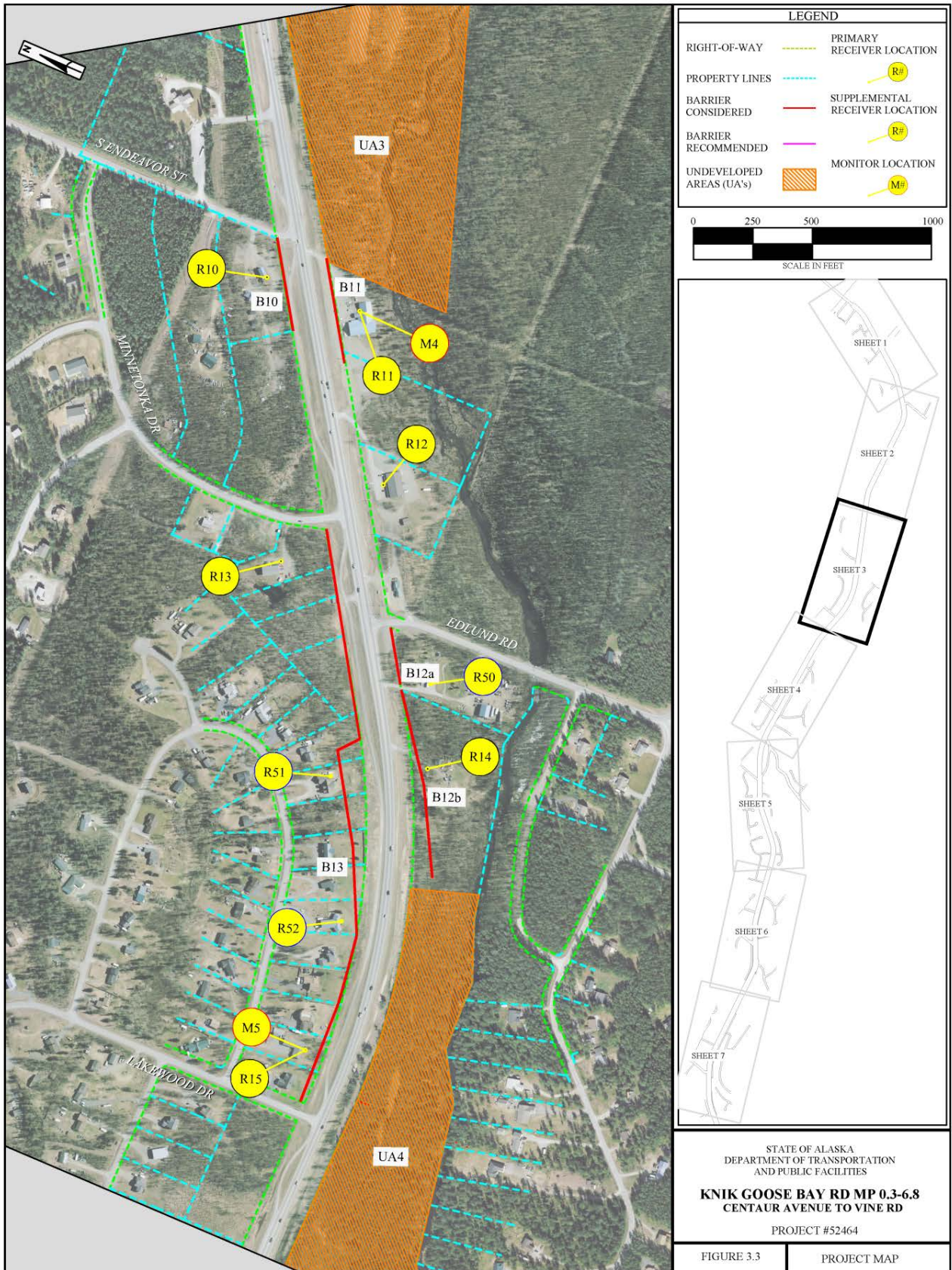
Project related noise impacts would occur for many of the properties along the length of the project. However, noise barriers meet the feasibility and reasonableness criteria in only three locations (assuming they receive the approval of at least 60% of affected homeowners). Per the DOT&PF Noise Policy, the project will not pursue abatement measures that do not meet these criteria.

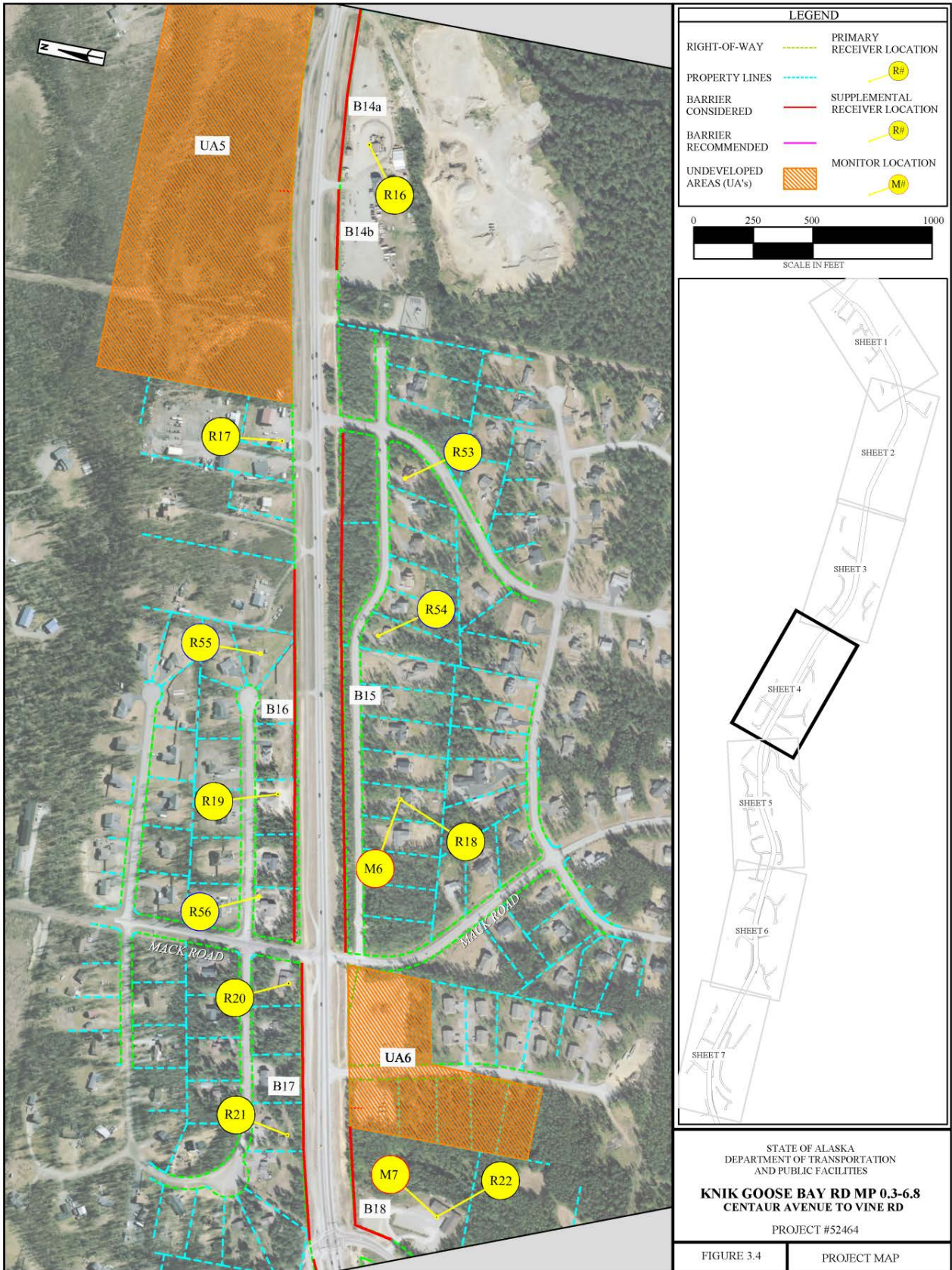
The report recommends noise barriers be constructed in the three areas identified as meeting the necessary criteria. These barriers can be constructed in such that they will not create a hazard for the driving public. A seven-foot barrier (B1) would provide noise abatement for the retirement community modeled by primary receiver R4 and supplemental receiver R46. A 15-foot barrier (B4) would provide noise abatement for the apartment complex modeled by primary receiver R6. A 12-foot barrier (B23) would provide noise abatement for the group of single and multi-family housing units modeled by primary receiver R28 and supplemental receiver R57.

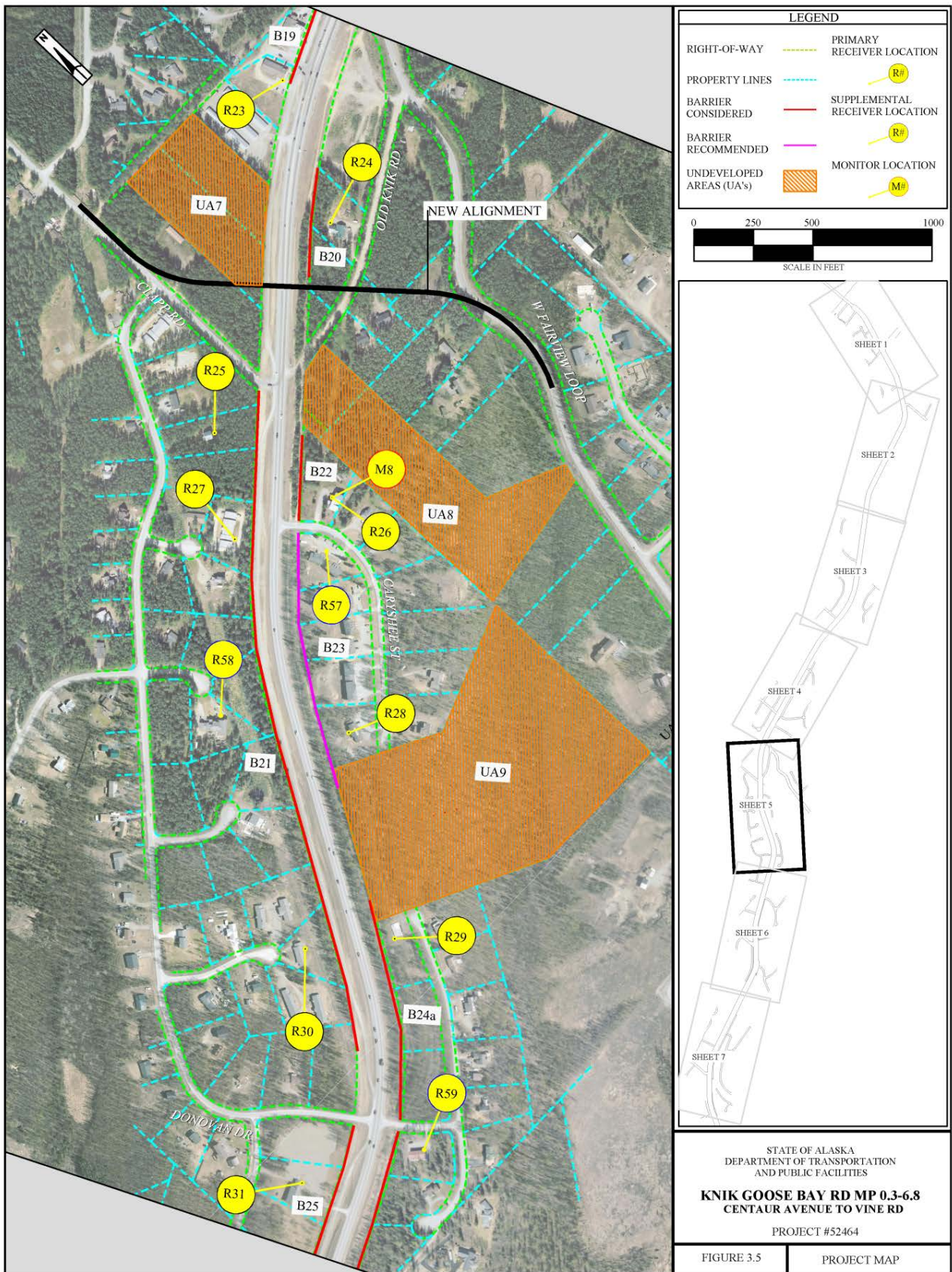
This conclusion is based upon available design data and current state and federal policies and laws.

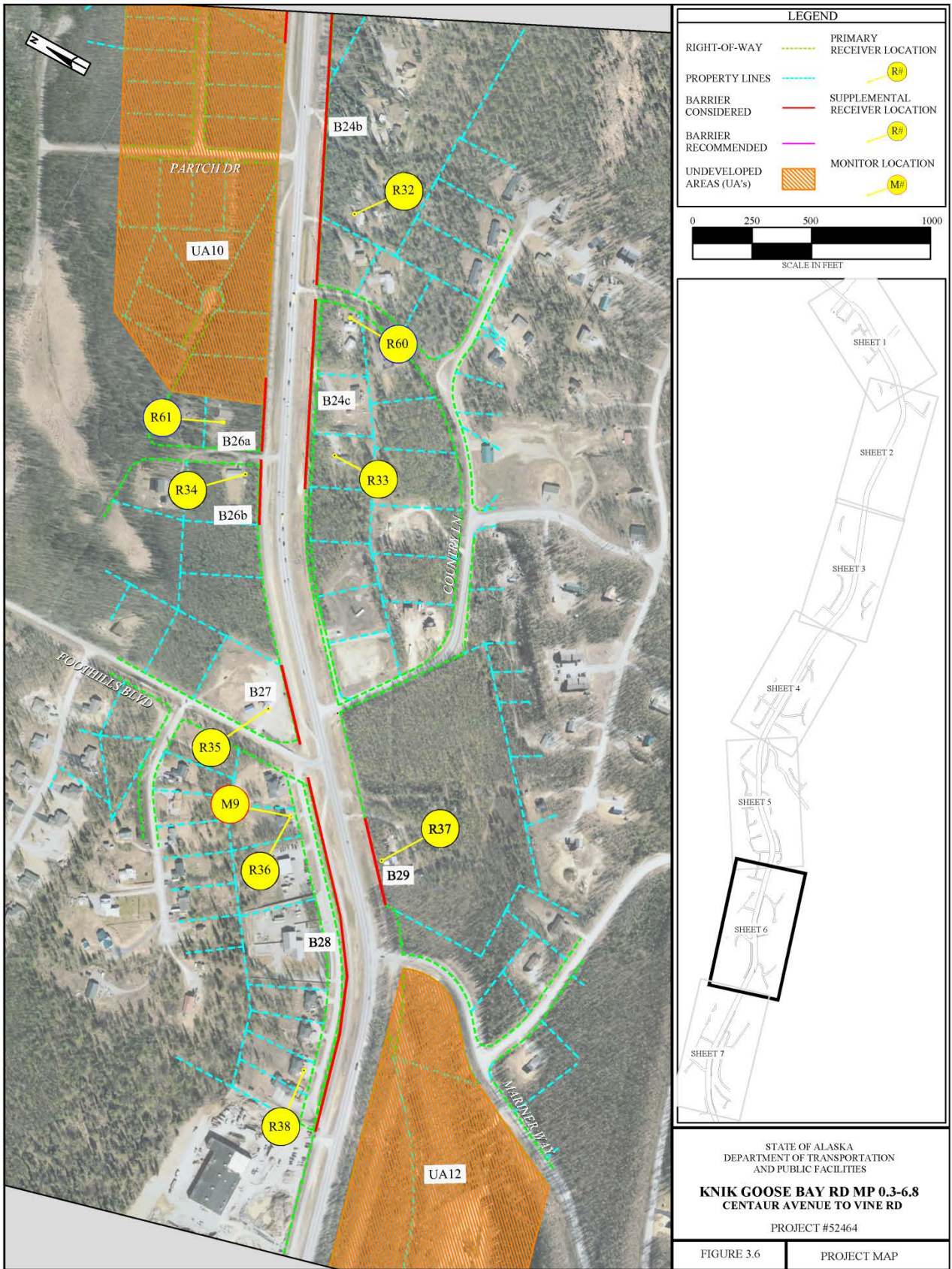


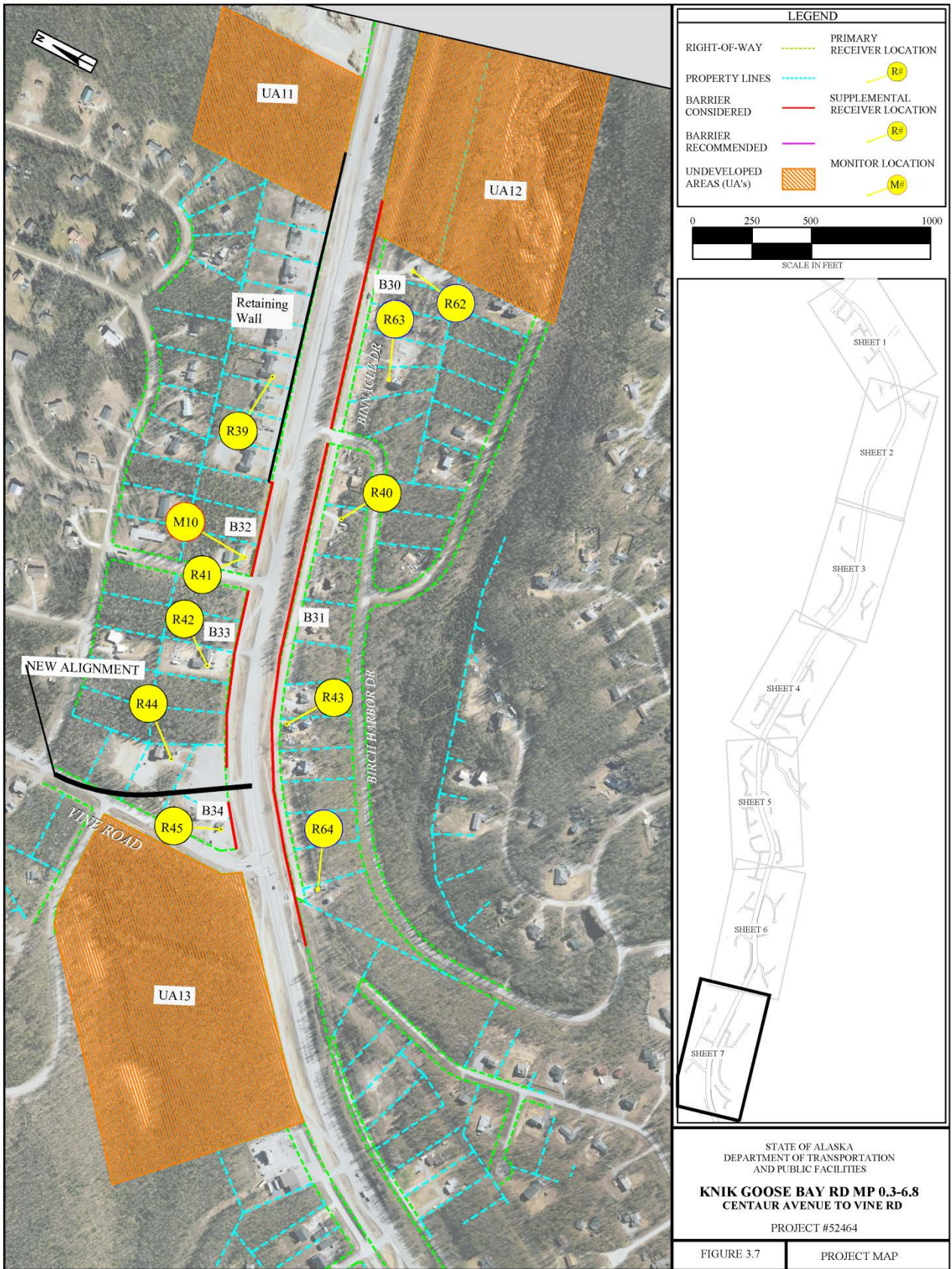












REFERENCES

Alaska Department of Transportation and Public Facilities. 2011. *Alaska Environmental Procedures Manual Noise Policy, April 2011.*

United States. 2010. *Code of Federal Regulations 23 CFR 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise.*

United States Department of Transportation. 2010. Rev January 2011. *Highway Traffic Noise Analysis and Abatement Guidance.*

FHWA Traffic Noise Model User's Guide, FHWA-PD-96-009, DOT-VNTPC-FHWA-98-1, January 1998

APPENDIX A:

Existing Noise Level Worksheets

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knik - Goose Bay Road (Lentaur-Vine)

RECEPTOR DESCRIPTION: M1 - Wasa Senior Housing

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: Nature Trail Bench

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak	
					MIN	SEC			
10/2/14	10:00AM	clear	5-10mph	45-50	15:00		60.7	72.4	
10/2/14	10:20 AM	clear	5-10 mph	45-50	15:00		62.1	75.0	
Leq AVERAGE =							61.4		

COMMENTS READING #1: Soft ground between meter & roadway
Acceleration lane for SB traffic
Striped Median separating opposing travel

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Krik - Goose Bay Road (Centaur - Vine) - M1

Date: 10/2/14

Time: 10:00 - 10:15, 10:20 - 10:35

Set 1:

Vehicle Type	Vehicle/Hour 15 min	Speed (MPH)
Auto	277	
Medium Truck	13	
Heavy Truck	17	
Buses	0	
Motorcycle	0	

Set 2:

Vehicle Type	Vehicle/Hour 15 min	Speed (MPH)
Auto	272	
Medium Truck	6	
Heavy Truck	17	
Buses	0	
Motorcycle	0	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Lentaur-Vine)

RECEPTOR DESCRIPTION: MZ - Coffee hut near Surfaceworks
Countertops - Business

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: At picnic table

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/3/14	12:00 PM	overcast	5-10 mph	40-45	15	00	69.5	76.6
10/3/14	12:20 PM	overcast	10-20 mph	40-45	15	00	72.5	85.5
Leq AVERAGE =							71.0	

COMMENTS READING #1: _____

COMMENTS READING #2: Significant wind gusts "

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur-Vine) - M2

Date: 10/3/14

Time: 12:00 - 12:15, 12:20 - 12:35

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	317	
Medium Truck	8	
Heavy Truck	8	
Buses	2	
Motorcycle	0	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	217	
Medium Truck	3	
Heavy Truck	11	
Buses	1	
Motorcycle	0	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Lentaur-Vine)

RECEPTOR DESCRIPTION: M3 - Baseball Fields

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: NE corner near dugout

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/2/14	10:55 AM	clear	3-5mph	45-50	15	00	59.0	65.4
10/2/14	11:15 AM	clear	5-8mph	45-50	15	00	59.6	67.9
Leq AVERAGE =							59.3	

COMMENTS READING #1: Gravel Lot in front of noise meter for ~50', then ~20' stand of alder blocking road (not super thick trees, but definitely could affect)

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur-Vine) - M3

Date: 10/2/14

Time: 10:55-11:10, 11:15-11:30

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	261	
Medium Truck	10	
Heavy Truck	7	
Buses	0	
Motorcycle	0	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	240	
Medium Truck	6	
Heavy Truck	14	
Buses	0	
Motorcycle	1	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Centaur-Vine)

RECEPTOR DESCRIPTION: M4 - Wasilla Christian Church

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: Front Porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/3/14	11:15 AM	overcast	0-3 mph	40-45	15	00	65.9	75.6
10/3/14	11:35 AM	overcast	0-3 mph	40-45	15	00	65.3	75.1
Leq AVERAGE =							65.6	

COMMENTS READING #1: _____

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur-Vine) - M4

Date: 10/3/14

Time: 11:15-11:30, 11:35-11:50

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	267	
Medium Truck	13	
Heavy Truck	13	
Buses	0	
Motorcycle	0	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	273	
Medium Truck	9	
Heavy Truck	16	
Buses	1	
Motorcycle	0	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Centaur-Vine)

RECEPTOR DESCRIPTION: M5 - Residence on Lakewood Drive

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: Front porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/2/14	11:45 AM	clear	3-5 mph	45-50	15	00	62.3	64.7
10/2/14	12:05 PM	clear	3-5 mph	45-50	15	00	61.6	69.5
Leq AVERAGE =							61.9	

COMMENTS READING #1: _____

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Krik - Goose Bay Road (Centaur - Vine) - M5

Date: 6/2/14

Time: 11:45-12:00, 12:05-12:20

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	307	
Medium Truck	4	
Heavy Truck	23	
Buses	1	
Motorcycle	0	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	292	
Medium Truck	7	
Heavy Truck	11	
Buses	3	
Motorcycle	1	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Centaur-Vine)

RECEPTOR DESCRIPTION: M6 - Residence on Stonebluff Drive

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: Front porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/3/14	10:30 AM	overcast	0-3 mph	45-50	15	00	60.9	67.5
10/3/14	10:50 AM	overcast	0-3 mph	45-50	15	00	59.4	65.1
Leq AVERAGE =							60.2	

COMMENTS READING #1: Significant # of trees between receiver & roadway

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Krik - Goose Bay Road (Centaur - Vine) - M6

Date: 10/3/14

Time: 10:30-10:45, 10:50-11:05

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	282	
Medium Truck	6	
Heavy Truck	15	
Buses	0	
Motorcycle	0	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	231	
Medium Truck	6	
Heavy Truck	8	
Buses	0	
Motorcycle	0	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knik - Goose Bay Road (Centaur-Vine)

RECEPTOR DESCRIPTION: M7- Christ First United Methodist Church

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: OFF Front porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak	
					MIN	SEC			
10/3/14	9:40 AM	overcast	0-3 mph	40-45	15	00	59.7	73.9	
10/3/14	10:00 AM	overcast	0-3 mph	40-45	15	00	59.9	74.4	
Leq AVERAGE =							59.8		

COMMENTS READING #1: 1 large truck on approach road
lots of stopping/accelerating @ INTX

COMMENTS READING #2: 4 large trucks on approach road
1 airplane

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur-Vine) - M7

Date: 10/3/14

Time: 9:40-9:55, 10:00-10:15

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	256	
Medium Truck	6	
Heavy Truck	11	
Buses	1	
Motorcycle	1	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	208	
Medium Truck	4	
Heavy Truck	13	
Buses	0	
Motorcycle	0	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Centaur-Vine)

RECEPTOR DESCRIPTION: M4 - Residence on Carysken

NOISE METER DESCRIPTION: Larson - Davis Noise Meter Model 820

NOISE METER LOCATION: Near front porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/2/14	3:15 PM	clear	S-10mph	45-50	15:00		62.1	69.4
10/2/14	3:35 PM	clear	S-10mph	45-50	15:00		62.9	68.2
Leq AVERAGE =							62.5	

COMMENTS READING #1: _____

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur - Vine) - M8

Date: 10/2/14

Time: 3:15-3:30, 3:35-3:50

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	276	
Medium Truck	5	
Heavy Truck	14	
Buses	8	
Motorcycle	1	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	289	
Medium Truck	10	
Heavy Truck	13	
Buses	2	
Motorcycle	1	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Centaur-Vine) M9

RECEPTOR DESCRIPTION: Residence on W. Reliance Road (near Foothills Blvd)

NOISE METER DESCRIPTION: Larson-Davis Noise Meter Model 820

NOISE METER LOCATION: Near front porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak
					MIN	SEC		
10/2/14	12:35 PM	clear	S-10mph	45-50	15	00	64.0	74.7
10/2/14	12:50 PM	clear	S-10mph	45-50	15	00	64.4	70.6
Leq AVERAGE =							64.2	

COMMENTS READING #1: Brush trimmer, 4-wheeler noise

COMMENTS READING #2: car idling nearby

COMMENTS READING #3:

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur-Vine) - M9

Date: 10/2/14

Time: 12:35-12:50, 12:55-1:10

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	223	
Medium Truck	5	
Heavy Truck	11	
Buses	0	
Motorcycle	6	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	228	
Medium Truck	3	
Heavy Truck	9	
Buses	0	
Motorcycle	0	

EXISTING NOISE LEVEL WORKSHEET

PROJECT ID: Knirk - Goose Bay Road (Centaur-Vine)

RECEPTOR DESCRIPTION: M10 - Residence on Harbor View Road

NOISE METER DESCRIPTION: Larson-Davis Noise Meter Model 820

NOISE METER LOCATION: Near front porch

READINGS TAKEN BY: Ryan Hammel & Peter Jackson

DATE	TIME	SKY	WIND	TEMP	DURATION		Leq	Lpeak	
					MIN	SEC			
10/2/14	1:35 PM	clear	5-10	45-50	15	00	65.0	71.9	
10/2/14	1:55 PM	clear	5-10	45-50	15	00	64.9	72.0	
Leq AVERAGE =							65.0		

COMMENTS READING #1: _____

COMMENTS READING #2: _____

COMMENTS READING #3: _____

Traffic Noise Study

Vehicle Type & Count

Route: Knik - Goose Bay Road (Centaur-Vine) - M10

Date: 10/2/14

Time: 1:35-1:50, 1:55-2:10

Set 1:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	143	
Medium Truck	7	
Heavy Truck	10	
Buses	2	
Motorcycle	2	

Set 2:

Vehicle Type	Vehicle/Hour	Speed (MPH)
Auto	225	
Medium Truck	4	
Heavy Truck	9	
Buses	0	
Motorcycle	0	

Appendix B:
TNM Output Tables

RESULTS: SOUND LEVELS

KGB

DOT&PF PD&E
RRH

16 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

KGB

RUN:

Validation

BARRIER DESIGN:

INPUT HEIGHTS

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

ATMOSPHERICS:

68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				Type Impact	With Barrier			
				LAeq1h		Increase over existing			Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
Receiver1	1	1	0.0	64.0	66	64.0	10	----	64.0	0.0	8	-8.0
Receiver2	2	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
Receiver3	3	1	0.0	60.9	66	60.9	10	----	60.9	0.0	8	-8.0
Receiver4	4	1	0.0	64.9	66	64.9	10	----	64.9	0.0	8	-8.0
Receiver5	5	1	0.0	62.4	66	62.4	10	----	62.4	0.0	8	-8.0
Receiver6	6	1	0.0	61.3	66	61.3	10	----	61.3	0.0	8	-8.0
Receiver7	7	1	0.0	59.6	66	59.6	10	----	59.6	0.0	8	-8.0
Receiver8	8	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
Receiver9	9	1	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	8	-8.0
Receiver10	10	1	0.0	63.8	66	63.8	10	----	63.8	0.0	8	-8.0
Receiver11	11	1	0.0	65.5	66	65.5	10	----	65.5	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	11	0.0	0.0	0.0
All Impacted	2	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

16 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: Existing - 2012
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				Type Impact	With Barrier			
				LAeq1h		Increase over existing			Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n	Calculated	Crit'n			Calculated	Goal	
				dBA	dBA	dBA	dB	dB	dB	dB	dB	dB
R1 - Business	1	1	0.0	62.7	71	62.7	15	----	62.7	0.0	5	-5.0
R2 - Business	2	1	0.0	59.8	71	59.8	15	----	59.8	0.0	5	-5.0
R3 - Business	3	1	0.0	65.1	71	65.1	15	----	65.1	0.0	5	-5.0
R4 - Residence	4	1	0.0	59.2	66	59.2	15	----	59.2	0.0	5	-5.0
R5 - Residence	5	1	0.0	60.3	66	60.3	15	----	60.3	0.0	5	-5.0
R6 - Residence	6	1	0.0	64.5	66	64.5	15	----	64.5	0.0	5	-5.0
R7 - Business	7	1	0.0	70.1	71	70.1	15	----	70.1	0.0	5	-5.0
R8 - Business	8	1	0.0	70.8	71	70.8	15	----	70.8	0.0	5	-5.0
R9 - Baseball Fields	9	1	0.0	64.6	66	64.6	15	----	64.6	0.0	5	-5.0
R10 - Residence	10	1	0.0	69.0	66	69.0	15	Snd Lvl	69.0	0.0	5	-5.0
R11 - Church	11	1	0.0	67.1	66	67.1	15	Snd Lvl	67.1	0.0	5	-5.0
R12 - Business	12	1	0.0	68.5	71	68.5	15	----	68.5	0.0	5	-5.0
R13 - Residence	13	1	0.0	65.1	66	65.1	15	----	65.1	0.0	5	-5.0
R14 - Residence	14	1	0.0	56.2	66	56.2	15	----	56.2	0.0	5	-5.0
R15 - Residence	15	1	0.0	50.5	66	50.5	15	----	50.5	0.0	5	-5.0
R16 - Business	16	1	0.0	54.2	71	54.2	15	----	54.2	0.0	5	-5.0
R17 - Business	17	1	0.0	63.5	71	63.5	15	----	63.5	0.0	5	-5.0
R18 - Residence	18	1	0.0	62.7	66	62.7	15	----	62.7	0.0	5	-5.0
R19 - Residence	19	1	0.0	66.4	66	66.4	15	Snd Lvl	66.4	0.0	5	-5.0
R20 - Residence	20	1	0.0	67.6	66	67.6	15	Snd Lvl	67.6	0.0	5	-5.0
R21 - Residence	21	1	0.0	65.4	66	65.4	15	----	65.4	0.0	5	-5.0
R22 - Church	22	1	0.0	56.3	66	56.3	15	----	56.3	0.0	5	-5.0
R23 - Business	23	1	0.0	57.1	71	57.1	15	----	57.1	0.0	5	-5.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	64.8	66	64.8	15	---	64.8	0.0	5	-5.0
R25 - Residence	25	1	0.0	63.4	66	63.4	15	---	63.4	0.0	5	-5.0
R26 - Residence	26	1	0.0	64.4	66	64.4	15	---	64.4	0.0	5	-5.0
R27 - Residence	27	1	0.0	66.1	66	66.1	15	Snd Lvl	66.1	0.0	5	-5.0
R28 - Residence	28	1	0.0	64.3	66	64.3	15	---	64.3	0.0	5	-5.0
R29 - Concrete Slab	29	1	0.0	66.1	66	66.1	15	Snd Lvl	66.1	0.0	5	-5.0
R30 - Residence	30	1	0.0	64.1	66	64.1	15	---	64.1	0.0	5	-5.0
R31 - Church	31	1	0.0	64.0	66	64.0	15	---	64.0	0.0	5	-5.0
R32 - Residence	32	1	0.0	64.5	66	64.5	15	---	64.5	0.0	5	-5.0
R33 - Residence	33	1	0.0	64.3	66	64.3	15	---	64.3	0.0	5	-5.0
R34 - Residence	34	1	0.0	65.3	66	65.3	15	---	65.3	0.0	5	-5.0
R35 - Business	35	1	0.0	65.6	71	65.6	15	---	65.6	0.0	5	-5.0
R36 - Residence	36	1	0.0	65.2	66	65.2	15	---	65.2	0.0	5	-5.0
R37 - Residence	37	1	0.0	67.7	66	67.7	15	Snd Lvl	67.7	0.0	5	-5.0
R38 - Residence	38	1	0.0	64.9	66	64.9	15	---	64.9	0.0	5	-5.0
R39 - Residence	39	1	0.0	65.8	66	65.8	15	---	65.8	0.0	5	-5.0
R40 - Residence	40	1	0.0	64.8	66	64.8	15	---	64.8	0.0	5	-5.0
R41 - Residence	41	1	0.0	67.3	66	67.3	15	Snd Lvl	67.3	0.0	5	-5.0
R42 - School/Daycare	42	1	0.0	60.9	66	60.9	15	---	60.9	0.0	5	-5.0
R43 - Residence	43	1	0.0	60.1	66	60.1	15	---	60.1	0.0	5	-5.0
R44 - Residence	44	1	0.0	58.4	66	58.4	15	---	58.4	0.0	5	-5.0
R45 - Business	45	1	0.0	65.6	71	65.6	15	---	65.6	0.0	5	-5.0
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	45	0.0	0.0	0.0								
All Impacted	8	0.0	0.0	0.0								
All that meet NR Goal	0	0.0	0.0	0.0								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

16 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: No-Build 2039
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				Type Impact	With Barrier			
				LAeq1h		Increase over existing			Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB	dBA	dB	dB	dB	
R1 - Business	1	1	0.0	68.5	71	68.5	15	---	68.5	0.0	5	-5.0
R2 - Business	2	1	0.0	64.8	71	64.8	15	----	64.8	0.0	5	-5.0
R3 - Business	3	1	0.0	68.7	71	68.7	15	----	68.7	0.0	5	-5.0
R4 - Residence	4	1	0.0	64.0	66	64.0	15	----	64.0	0.0	5	-5.0
R5 - Residence	5	1	0.0	69.4	66	69.4	15	Snd Lvl	69.4	0.0	5	-5.0
R6 - Residence	6	1	0.0	69.9	66	69.9	15	Snd Lvl	69.9	0.0	5	-5.0
R7 - Business	7	1	0.0	74.7	71	74.7	15	Snd Lvl	74.7	0.0	5	-5.0
R8 - Business	8	1	0.0	75.2	71	75.2	15	Snd Lvl	75.2	0.0	5	-5.0
R9 - Residence	9	1	0.0	72.6	66	72.6	15	Snd Lvl	72.6	0.0	5	-5.0
R10 - Residence	10	1	0.0	73.4	66	73.4	15	Snd Lvl	73.4	0.0	5	-5.0
R11 - Church	11	1	0.0	71.6	66	71.6	15	Snd Lvl	71.6	0.0	5	-5.0
R12 - Business	12	1	0.0	73.1	71	73.1	15	Snd Lvl	73.1	0.0	5	-5.0
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	70.2	0.0	5	-5.0
R14 - Residence	14	1	0.0	72.5	66	72.5	15	Snd Lvl	72.5	0.0	5	-5.0
R15 - Residence	15	1	0.0	72.3	66	72.3	15	Snd Lvl	72.3	0.0	5	-5.0
R16 - Business	16	1	0.0	70.3	71	70.3	15	---	70.3	0.0	5	-5.0
R17 - Business	17	1	0.0	68.2	71	68.2	15	----	68.2	0.0	5	-5.0
R18 - Residence	18	1	0.0	67.4	66	67.4	15	Snd Lvl	67.4	0.0	5	-5.0
R19 - Residence	19	1	0.0	71.0	66	71.0	15	Snd Lvl	71.0	0.0	5	-5.0
R20 - Residence	20	1	0.0	72.2	66	72.2	15	Snd Lvl	72.2	0.0	5	-5.0
R21 - Residence	21	1	0.0	71.7	66	71.7	15	Snd Lvl	71.7	0.0	5	-5.0
R22 - Church	22	1	0.0	65.9	66	65.9	15	---	65.9	0.0	5	-5.0
R23 - Business	23	1	0.0	73.5	71	73.5	15	Snd Lvl	73.5	0.0	5	-5.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.8	66	71.8	15	Snd Lvl	71.8	0.0	5	-5.0
R25 - Residence	25	1	0.0	69.1	66	69.1	15	Snd Lvl	69.1	0.0	5	-5.0
R26 - Residence	26	1	0.0	70.1	66	70.1	15	Snd Lvl	70.1	0.0	5	-5.0
R27 - Residence	27	1	0.0	71.9	66	71.9	15	Snd Lvl	71.9	0.0	5	-5.0
R28 - Residence	28	1	0.0	70.9	66	70.9	15	Snd Lvl	70.9	0.0	5	-5.0
R29 - Concrete Slab	29	1	0.0	72.6	66	72.6	15	Snd Lvl	72.6	0.0	5	-5.0
R30 - Residence	30	1	0.0	70.4	66	70.4	15	Snd Lvl	70.4	0.0	5	-5.0
R31 - Church	31	1	0.0	70.0	66	70.0	15	Snd Lvl	70.0	0.0	5	-5.0
R32 - Residence	32	1	0.0	69.9	66	69.9	15	Snd Lvl	69.9	0.0	5	-5.0
R33 - Residence	33	1	0.0	70.6	66	70.6	15	Snd Lvl	70.6	0.0	5	-5.0
R34 - Residence	34	1	0.0	72.4	66	72.4	15	Snd Lvl	72.4	0.0	5	-5.0
R35 - Business	35	1	0.0	71.2	71	71.2	15	Snd Lvl	71.2	0.0	5	-5.0
R36 - Residence	36	1	0.0	70.8	66	70.8	15	Snd Lvl	70.8	0.0	5	-5.0
R37 - Residence	37	1	0.0	73.6	66	73.6	15	Snd Lvl	73.6	0.0	5	-5.0
R38 - Residence	38	1	0.0	70.9	66	70.9	15	Snd Lvl	70.9	0.0	5	-5.0
R39 - Residence	39	1	0.0	71.1	66	71.1	15	Snd Lvl	71.1	0.0	5	-5.0
R40 - Residence	40	1	0.0	70.3	66	70.3	15	Snd Lvl	70.3	0.0	5	-5.0
R41 - Residence	41	1	0.0	72.9	66	72.9	15	Snd Lvl	72.9	0.0	5	-5.0
R42 - School/Daycare	42	1	0.0	70.8	66	70.8	15	Snd Lvl	70.8	0.0	5	-5.0
R43 - Residence	43	1	0.0	72.4	66	72.4	15	Snd Lvl	72.4	0.0	5	-5.0
R44 - Residence	44	1	0.0	67.5	66	67.5	15	Snd Lvl	67.5	0.0	5	-5.0
R45 - Business	45	1	0.0	72.1	71	72.1	15	Snd Lvl	72.1	0.0	5	-5.0
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	45	0.0	0.0	0.0								
All Impacted	38	0.0	0.0	0.0								
All that meet NR Goal	0	0.0	0.0	0.0								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

16 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4-Lane 2039 No Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1 - Business	1	1	0.0	68.0	71	68.0	15	----	68.0	0.0	5	-5.0
R2 - Business	2	1	0.0	65.8	71	65.8	15	----	65.8	0.0	5	-5.0
R3 - Business	3	1	0.0	70.9	71	70.9	15	----	70.9	0.0	5	-5.0
R4 - Residence	4	1	0.0	64.5	66	64.5	15	----	64.5	0.0	5	-5.0
R5 - Residence	5	1	0.0	66.6	66	66.6	15	Snd Lvl	66.6	0.0	5	-5.0
R6 - Residence	6	1	0.0	69.1	66	69.1	15	Snd Lvl	69.1	0.0	5	-5.0
R7 - Business	7	1	0.0	75.1	71	75.1	15	Snd Lvl	75.1	0.0	5	-5.0
R8 - Business	8	1	0.0	75.6	71	75.6	15	Snd Lvl	75.6	0.0	5	-5.0
R9 - Residence	9	1	0.0	72.2	66	72.2	15	Snd Lvl	72.2	0.0	5	-5.0
R10 - Residence	10	1	0.0	73.4	66	73.4	15	Snd Lvl	73.4	0.0	5	-5.0
R11 - Church	11	1	0.0	72.1	66	72.1	15	Snd Lvl	72.1	0.0	5	-5.0
R12 - Business	12	1	0.0	73.3	71	73.3	15	Snd Lvl	73.3	0.0	5	-5.0
R13 - Residence	13	1	0.0	70.3	66	70.3	15	Snd Lvl	70.3	0.0	5	-5.0
R14 - Residence	14	1	0.0	73.1	66	73.1	15	Snd Lvl	73.1	0.0	5	-5.0
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	72.2	0.0	5	-5.0
R16 - Business	16	1	0.0	70.5	71	70.5	15	---	70.5	0.0	5	-5.0
R17 - Business	17	1	0.0	68.3	71	68.3	15	----	68.3	0.0	5	-5.0
R18 - Residence	18	1	0.0	67.5	66	67.5	15	Snd Lvl	67.5	0.0	5	-5.0
R19 - Residence	19	1	0.0	71.3	66	71.3	15	Snd Lvl	71.3	0.0	5	-5.0
R20 - Residence	20	1	0.0	72.5	66	72.5	15	Snd Lvl	72.5	0.0	5	-5.0
R21 - Residence	21	1	0.0	71.9	66	71.9	15	Snd Lvl	71.9	0.0	5	-5.0
R22 - Church	22	1	0.0	66.0	66	66.0	15	Snd Lvl	66.0	0.0	5	-5.0
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	73.4	0.0	5	-5.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.8	66	71.8	15	Snd Lvl	71.8	0.0	5	-5.0
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	69.2	0.0	5	-5.0
R26 - Residence	26	1	0.0	70.3	66	70.3	15	Snd Lvl	70.3	0.0	5	-5.0
R27 - Residence	27	1	0.0	72.0	66	72.0	15	Snd Lvl	72.0	0.0	5	-5.0
R28 - Residence	28	1	0.0	71.3	66	71.3	15	Snd Lvl	71.3	0.0	5	-5.0
R29 - Concrete Slab	29	1	0.0	72.8	66	72.8	15	Snd Lvl	72.8	0.0	5	-5.0
R30 - Residence	30	1	0.0	70.6	66	70.6	15	Snd Lvl	70.6	0.0	5	-5.0
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	70.2	0.0	5	-5.0
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	70.1	0.0	5	-5.0
R33 - Residence	33	1	0.0	70.9	66	70.9	15	Snd Lvl	70.9	0.0	5	-5.0
R34 - Residence	34	1	0.0	72.4	66	72.4	15	Snd Lvl	72.4	0.0	5	-5.0
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	71.3	0.0	5	-5.0
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	70.7	0.0	5	-5.0
R37 - Residence	37	1	0.0	74.7	66	74.7	15	Snd Lvl	74.7	0.0	5	-5.0
R38 - Residence	38	1	0.0	70.7	66	70.7	15	Snd Lvl	70.7	0.0	5	-5.0
R39 - Residence	39	1	0.0	71.2	66	71.2	15	Snd Lvl	71.2	0.0	5	-5.0
R40 - Residence	40	1	0.0	70.6	66	70.6	15	Snd Lvl	70.6	0.0	5	-5.0
R41 - Residence	41	1	0.0	73.3	66	73.3	15	Snd Lvl	73.3	0.0	5	-5.0
R42 - School/Daycare	42	1	0.0	70.9	66	70.9	15	Snd Lvl	70.9	0.0	5	-5.0
R43 - Residence	43	1	0.0	73.0	66	73.0	15	Snd Lvl	73.0	0.0	5	-5.0
R44 - Residence	44	1	0.0	67.9	66	67.9	15	Snd Lvl	67.9	0.0	5	-5.0
R45 - Business	45	1	0.0	72.8	71	72.8	15	Snd Lvl	72.8	0.0	5	-5.0
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	45	0.0	0.0	0.0								
All Impacted	39	0.0	0.0	0.0								
All that meet NR Goal	0	0.0	0.0	0.0								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

**DOT&PF
RRH**

**30 October 2014
TNM 2.5
Calculated with TNM 2.5**

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

KGB Centaur-Vine

RUN:

4 and 6-Lane 2039 0' Barriers

BARRIER DESIGN:

INPUT HEIGHTS

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

ATMOSPHERICS:

68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n			Calculated	Goal	
				dB	dB	dB	dB	dB	dB	dB	dB	
R1 - Business	1	1	0.0	67.6	71	67.6	15	----	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	----	66.1	0.0	5	-5.0
R3 - Business	3	1	0.0	71.8	71	71.8	15	Snd Lvl	71.8	0.0	5	-5.0
R4 - Residence	4	1	0.0	65.8	66	65.8	15	----	65.8	0.0	5	-5.0
R5 - Residence	5	1	0.0	70.6	66	70.6	15	Snd Lvl	70.8	-0.2	5	-5.2
R6 - Residence	6	1	0.0	71.8	66	71.8	15	Snd Lvl	71.8	0.0	5	-5.0
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	74.0	-0.4	5	-5.4
R8 - Business	8	1	0.0	76.0	71	76.0	15	Snd Lvl	76.0	0.0	5	-5.0
R9 - Baseball Fields	9	1	0.0	69.0	66	69.0	15	Snd Lvl	70.8	-1.8	5	-6.8
R10 - Residence	10	1	0.0	73.4	66	73.4	15	Snd Lvl	73.4	0.0	5	-5.0
R11 - Church	11	1	0.0	72.4	66	72.4	15	Snd Lvl	72.4	0.0	5	-5.0
R12 - Business	12	1	0.0	69.5	71	69.5	15	----	69.8	-0.3	5	-5.3
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	70.2	0.0	5	-5.0
R14 - Residence	14	1	0.0	68.2	66	68.2	15	Snd Lvl	68.4	-0.2	5	-5.2
R15 - Residence	15	1	0.0	72.1	66	72.1	15	Snd Lvl	72.2	-0.1	5	-5.1
R16 - Business	16	1	0.0	70.7	71	70.7	15	----	70.7	0.0	5	-5.0
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	68.5	0.0	5	-5.0
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	67.7	0.0	5	-5.0
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	71.8	0.0	5	-5.0
R20 - Residence	20	1	0.0	72.6	66	72.6	15	Snd Lvl	72.6	0.0	5	-5.0
R21 - Residence	21	1	0.0	72.0	66	72.0	15	Snd Lvl	72.0	0.0	5	-5.0
R22 - Church	22	1	0.0	65.9	66	65.9	15	---	65.9	0.0	5	-5.0
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	73.4	0.0	5	-5.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.8	66	71.8	15	Snd Lvl	71.8	0.0	5	-5.0
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	69.2	0.0	5	-5.0
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	70.1	-1.0	5	-6.0
R27 - Residence	27	1	0.0	69.4	66	69.4	15	Snd Lvl	69.1	0.3	5	-4.7
R28 - Residence	28	1	0.0	69.3	66	69.3	15	Snd Lvl	70.0	-0.7	5	-5.7
R29 - Concrete Slab	29	1	0.0	72.8	66	72.8	15	Snd Lvl	72.8	0.0	5	-5.0
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	69.0	-0.2	5	-5.2
R31 - Church	31	1	0.0	70.1	66	70.1	15	Snd Lvl	70.1	0.0	5	-5.0
R32 - Residence	32	1	0.0	70.0	66	70.0	15	Snd Lvl	70.0	0.0	5	-5.0
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	69.9	-1.6	5	-6.6
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	65.7	0.5	5	-4.5
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	71.3	0.0	5	-5.0
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	70.7	0.0	5	-5.0
R37 - Residence	37	1	0.0	74.7	66	74.7	15	Snd Lvl	74.8	-0.1	5	-5.1
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	70.0	-0.3	5	-5.3
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.7	7.7	5	2.7
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	67.7	0.0	5	-5.0
R41 - Residence	41	1	0.0	72.6	66	72.6	15	Snd Lvl	72.8	-0.2	5	-5.2
R42 - School/Daycare	42	1	0.0	70.3	66	70.3	15	Snd Lvl	70.4	-0.1	5	-5.1
R43 - Residence	43	1	0.0	70.7	66	70.7	15	Snd Lvl	70.9	-0.2	5	-5.2
R44 - Residence	44	1	0.0	64.6	66	64.6	15	---	64.7	-0.1	5	-5.1
R45 - Business	45	1	0.0	72.4	71	72.4	15	Snd Lvl	72.5	-0.1	5	-5.1
Receiver46 - Residence	46	1	0.0	70.9	66	70.9	10	Snd Lvl	70.9	0.0	5	-5.0
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	70.3	0.0	5	-5.0
Receiver48 - Residence	48	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	5	-5.0
Receiver49 - Baseball Fields	49	1	0.0	67.4	66	67.4	10	Snd Lvl	68.4	-1.0	5	-6.0
Receiver50 - Residence	51	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	5	-5.0
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	64.5	-0.9	5	-5.9
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	68.9	-1.3	5	-6.3
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	66.9	-0.6	5	-5.6
Receiver54 - Residence	55	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	5	-5.0
Receiver55 - Residence	56	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	5	-5.0
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	5	-5.0
Receiver57 - Residence	58	1	0.0	68.5	66	68.5	10	Snd Lvl	69.4	-0.9	5	-5.9
Receiver58 - Residence	59	1	0.0	67.1	66	67.1	10	Snd Lvl	68.0	-0.9	5	-5.9
Receiver59 - Residence	60	1	0.0	70.3	66	70.3	10	Snd Lvl	70.4	-0.1	5	-5.1
Receiver60 - Residence	61	1	0.0	68.4	66	68.4	10	Snd Lvl	69.5	-1.1	5	-6.1
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	66.0	-0.1	5	-5.1
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	5	-5.0
Receiver63 - Residence	65	1	0.0	69.0	66	69.0	10	Snd Lvl	69.0	0.0	5	-5.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.1	66	70.1	10	Snd Lvl	70.5	-0.4	8	-8.4
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	-1.8	-0.1	7.7								
All Impacted	54	-1.8	-0.1	7.7								
All that meet NR Goal	1	7.7	7.7	7.7								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

29 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 5' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
				dB	dB	dB	dB	dB	dB	dB	dB	
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.9	0.2	5	-4.8
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	70.1	1.8	5	-3.2
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	65.0	0.9	5	-4.1
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	66.2	4.5	5	-0.5
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	71.6	0.3	5	-4.7
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	66.0	7.6	5	2.6
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	73.2	2.9	5	-2.1
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	65.1	4.0	5	-1.0
R10 - Residence	10	1	0.0	73.4	66	73.4	15	Snd Lvl	73.4	0.0	5	-5.0
R11 - Church	11	1	0.0	72.5	66	72.5	15	Snd Lvl	68.5	4.0	5	-1.0
R12 - Business	12	1	0.0	66.2	71	66.2	15	---	66.2	0.0	5	-5.0
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	68.9	1.3	5	-3.7
R14 - Residence	14	1	0.0	68.3	66	68.3	15	Snd Lvl	62.3	6.0	5	1.0
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	67.2	5.0	5	0.0
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	68.8	2.0	5	-3.0
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	65.4	3.1	5	-1.9
R18 - Residence	18	1	0.0	67.8	66	67.8	15	Snd Lvl	66.0	1.8	5	-3.2
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	68.7	3.1	5	-1.9
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	72.7	0.0	5	-5.0
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	72.1	0.0	5	-5.0
R22 - Church	22	1	0.0	65.8	66	65.8	15	---	65.7	0.1	5	-4.9
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	71.0	2.4	5	-2.6

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	68.5	3.4	5	-1.6
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	65.5	3.7	5	-1.3
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	65.8	3.3	5	-1.7
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	63.0	6.5	5	1.5
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	65.7	3.7	5	-1.3
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	69.5	3.4	5	-1.6
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	64.6	4.2	5	-0.8
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	68.6	1.6	5	-3.4
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	69.7	0.4	5	-4.6
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	65.5	2.8	5	-2.2
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	63.2	3.0	5	-2.0
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	68.1	3.2	5	-1.8
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	66.9	3.8	5	-1.2
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	67.2	7.6	5	2.6
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	64.9	4.8	5	-0.2
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.7	7.7	5	2.7
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	67.5	0.2	5	-4.8
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	66.4	6.4	5	1.4
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	65.3	5.1	5	0.1
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	67.0	3.8	5	-1.2
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	64.1	0.4	5	-4.6
R45 - Business	45	1	0.0	68.1	71	68.1	15	---	68.1	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	70.9	66	70.9	10	Snd Lvl	66.6	4.3	5	-0.7
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	68.8	1.5	5	-3.5
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	71.9	0.0	5	-5.0
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	65.7	1.8	5	-3.2
Receiver50 - Residence	51	1	0.0	71.3	66	71.3	10	Snd Lvl	69.5	1.8	5	-3.2
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	63.0	0.6	5	-4.4
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	64.1	3.5	5	-1.5
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	63.9	2.4	5	-2.6
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	67.1	2.7	5	-2.3
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	65.7	4.1	5	-0.9
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	5	-5.0
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	65.1	3.5	5	-1.5
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	62.8	4.4	5	-0.6
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	68.1	2.3	5	-2.7
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	65.6	2.9	5	-2.1
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	64.2	1.7	5	-3.3
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	5	-5.0
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	69.0	0.1	5	-4.9

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	65.1	5.1	8	-2.9
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	2.7	7.7								
All Impacted	53	0.0	3.1	7.7								
All that meet NR Goal	8	5.0	6.5	7.7								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

29 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 6' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	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
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.8	0.3	5	-4.7
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	68.8	3.1	5	-1.9
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	64.5	1.4	5	-3.6
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	65.8	4.9	5	-0.1
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	70.2	1.7	5	-3.3
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	65.6	8.0	5	3.0
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	69.5	6.6	5	1.6
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	64.6	4.5	5	-0.5
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	73.5	0.0	5	-5.0
R11 - Church	11	1	0.0	72.5	66	72.5	15	Snd Lvl	67.6	4.9	5	-0.1
R12 - Business	12	1	0.0	65.3	71	65.3	15	---	65.3	0.0	5	-5.0
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	68.4	1.8	5	-3.2
R14 - Residence	14	1	0.0	68.3	66	68.3	15	Snd Lvl	60.9	7.4	5	2.4
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	65.9	6.3	5	1.3
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	67.6	3.2	5	-1.8
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	64.7	3.8	5	-1.2
R18 - Residence	18	1	0.0	67.8	66	67.8	15	Snd Lvl	65.6	2.2	5	-2.8
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	66.6	5.2	5	0.2
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	72.7	0.0	5	-5.0
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	72.0	0.1	5	-4.9
R22 - Church	22	1	0.0	65.7	66	65.7	15	---	65.5	0.2	5	-4.8
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.7	2.7	5	-2.3

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	67.4	4.5	5	-0.5
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	65.1	4.1	5	-0.9
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	65.3	3.8	5	-1.2
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	62.2	7.3	5	2.3
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	65.1	4.3	5	-0.7
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	67.6	5.3	5	0.3
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	63.7	5.1	5	0.1
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	68.0	2.2	5	-2.8
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	68.7	1.4	5	-3.6
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	65.2	3.1	5	-1.9
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	62.8	3.4	5	-1.6
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	66.8	4.5	5	-0.5
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	65.7	5.0	5	0.0
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	66.2	8.6	5	3.6
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	64.2	5.5	5	0.5
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.7	7.7	5	2.7
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	66.4	1.3	5	-3.7
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	65.9	6.9	5	1.9
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	64.8	5.6	5	0.6
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	66.0	4.8	5	-0.2
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.9	0.6	5	-4.4
R45 - Business	45	1	0.0	67.5	71	67.5	15	---	67.5	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	70.9	66	70.9	10	Snd Lvl	64.9	6.0	5	1.0
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	67.9	2.4	5	-2.6
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	70.7	1.2	5	-3.8
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	65.4	2.1	5	-2.9
Receiver50 - Residence	51	1	0.0	71.3	66	71.3	10	Snd Lvl	68.4	2.9	5	-2.1
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	62.9	0.7	5	-4.3
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	63.5	4.1	5	-0.9
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	63.5	2.8	5	-2.2
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	66.4	3.4	5	-1.6
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	64.4	5.4	5	0.4
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	69.1	0.1	5	-4.9
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	64.3	4.3	5	-0.7
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	62.2	5.0	5	0.0
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	67.0	3.4	5	-1.6
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	64.6	3.9	5	-1.1
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	63.5	2.4	5	-2.6
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	68.9	0.0	5	-5.0
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	69.0	0.1	5	-4.9

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	64.6	5.6	8	-2.4
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	3.4	8.6								
All Impacted	53	0.0	3.9	8.6								
All that meet NR Goal	16	5.0	6.4	8.6								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

29 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 7' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h	No Barrier					With Barrier			
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
R1 - Business	1	1	0.0	67.6	71	67.6	15	----	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	----	65.8	0.3	5	-4.7
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	66.2	5.7	5	0.7
R4 - Residence	4	1	0.0	65.9	66	65.9	15	----	64.1	1.8	5	-3.2
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	65.6	5.1	5	0.1
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	69.2	2.7	5	-2.3
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	65.2	8.4	5	3.4
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	67.2	8.9	5	3.9
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	64.2	4.9	5	-0.1
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	72.2	1.3	5	-3.7
R11 - Church	11	1	0.0	72.5	66	72.5	15	Snd Lvl	67.2	5.3	5	0.3
R12 - Business	12	1	0.0	64.7	71	64.7	15	----	64.6	0.1	5	-4.9
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	67.8	2.4	5	-2.6
R14 - Residence	14	1	0.0	68.3	66	68.3	15	Snd Lvl	60.1	8.2	5	3.2
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	65.0	7.2	5	2.2
R16 - Business	16	1	0.0	70.8	71	70.8	15	----	66.5	4.3	5	-0.7
R17 - Business	17	1	0.0	68.5	71	68.5	15	----	64.4	4.1	5	-0.9
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	64.7	3.0	5	-2.0
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	65.0	6.8	5	1.8
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	71.4	1.3	5	-3.7
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	70.3	1.8	5	-3.2
R22 - Church	22	1	0.0	65.6	66	65.6	15	----	65.3	0.3	5	-4.7
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.5	2.9	5	-2.1

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	66.7	5.2	5	0.2
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	64.7	4.5	5	-0.5
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	64.9	4.2	5	-0.8
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	61.6	7.9	5	2.9
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	64.3	5.1	5	0.1
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	66.4	6.5	5	1.5
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	63.1	5.7	5	0.7
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	67.0	3.2	5	-1.8
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	68.5	1.6	5	-3.4
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	65.0	3.3	5	-1.7
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	62.5	3.7	5	-1.3
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	66.4	4.9	5	-0.1
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	65.1	5.6	5	0.6
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	65.2	9.6	5	4.6
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	63.7	6.0	5	1.0
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.7	7.7	5	2.7
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	65.6	2.1	5	-2.9
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	65.5	7.3	5	2.3
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	64.3	6.1	5	1.1
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	65.5	5.3	5	0.3
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.8	0.7	5	-4.3
R45 - Business	45	1	0.0	67.2	71	67.2	15	---	67.2	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	71.0	66	71.0	10	Snd Lvl	64.2	6.8	5	1.8
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	67.1	3.2	5	-1.8
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	70.5	1.4	5	-3.6
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	65.1	2.4	5	-2.6
Receiver50 - Residence	51	1	0.0	71.3	66	71.3	10	Snd Lvl	67.8	3.5	5	-1.5
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	62.7	0.9	5	-4.1
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	62.8	4.8	5	-0.2
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	63.1	3.2	5	-1.8
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	63.7	6.1	5	1.1
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	63.8	6.0	5	1.0
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	69.0	0.2	5	-4.8
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	63.9	4.7	5	-0.3
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	61.4	5.8	5	0.8
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	66.2	4.2	5	-0.8
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	64.1	4.4	5	-0.6
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	62.9	3.0	5	-2.0
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	67.5	1.4	5	-3.6
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	68.5	0.6	5	-4.4

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	64.1	6.1	8	-1.9
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	4.1	9.6								
All Impacted	53	0.2	4.6	9.6								
All that meet NR Goal	24	5.1	6.6	9.6								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

29 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 8' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				Type Impact	With Barrier			
				LAeq1h		Increase over existing			Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n	Calculated	Crit'n			Calculated	Goal	
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.7	0.4	5	-4.6
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	65.5	6.4	5	1.4
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	63.3	2.6	5	-2.4
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	65.4	5.3	5	0.3
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	67.3	4.6	5	-0.4
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	65.0	8.6	5	3.6
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	66.0	10.1	5	5.1
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	63.9	5.2	5	0.2
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	72.0	1.5	5	-3.5
R11 - Church	11	1	0.0	72.5	66	72.5	15	Snd Lvl	66.8	5.7	5	0.7
R12 - Business	12	1	0.0	64.2	71	64.2	15	---	64.1	0.1	5	-4.9
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	67.0	3.2	5	-1.8
R14 - Residence	14	1	0.0	68.2	66	68.2	15	Snd Lvl	59.7	8.5	5	3.5
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	64.4	7.8	5	2.8
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	65.4	5.4	5	0.4
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	64.2	4.3	5	-0.7
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	62.5	5.2	5	0.2
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	64.1	7.7	5	2.7
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	70.1	2.6	5	-2.4
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	69.1	3.0	5	-2.0
R22 - Church	22	1	0.0	65.4	66	65.4	15	---	65.1	0.3	5	-4.7
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.4	3.0	5	-2.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	66.1	5.8	5	0.8
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	64.4	4.8	5	-0.2
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	64.5	4.6	5	-0.4
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	61.0	8.5	5	3.5
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	63.9	5.5	5	0.5
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	65.6	7.3	5	2.3
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	62.5	6.3	5	1.3
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	65.6	4.6	5	-0.4
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	68.0	2.1	5	-2.9
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	64.9	3.4	5	-1.6
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	62.3	3.9	5	-1.1
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	66.1	5.2	5	0.2
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	64.6	6.1	5	1.1
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	64.4	10.4	5	5.4
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	63.3	6.4	5	1.4
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.7	7.7	5	2.7
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	65.3	2.4	5	-2.6
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	65.2	7.6	5	2.6
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	63.9	6.5	5	1.5
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	64.8	6.0	5	1.0
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.8	0.7	5	-4.3
R45 - Business	45	1	0.0	66.8	71	66.8	15	---	66.8	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	71.0	66	71.0	10	Snd Lvl	63.6	7.4	5	2.4
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	66.3	4.0	5	-1.0
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	69.4	2.5	5	-2.5
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	64.9	2.6	5	-2.4
Receiver50 - Residence	51	1	0.0	71.3	66	71.3	10	Snd Lvl	67.2	4.1	5	-0.9
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	62.6	1.0	5	-4.0
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	62.0	5.6	5	0.6
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	62.8	3.5	5	-1.5
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	62.9	6.9	5	1.9
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	63.3	6.5	5	1.5
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	68.4	0.8	5	-4.2
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	63.4	5.2	5	0.2
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	60.6	6.6	3	1.6
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	65.5	4.9	5	-0.1
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	63.7	4.8	5	-0.2
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	62.7	3.2	5	-1.8
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	67.2	1.7	5	-3.3
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	67.3	1.8	5	-3.2

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	63.7	6.5	8	-1.5
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	4.6	10.4								
All Impacted	53	0.8	5.3	10.4								
All that meet NR Goal	30	5.2	6.8	10.4								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

30 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 9' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				Type Impact	With Barrier			
				LAeq1h		Increase over existing			Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dBA	dBA	dBA	dB	dB	dBA	dB	dB	dB	
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.7	0.4	5	-4.6
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	64.9	7.0	5	2.0
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	62.5	3.4	5	-1.6
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	65.2	5.5	5	0.5
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	66.9	5.0	5	0.0
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	64.8	8.8	5	3.8
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	65.0	11.1	5	6.1
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	63.6	5.5	5	0.5
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	70.8	2.7	5	-2.3
R11 - Church	11	1	0.0	72.5	66	72.5	15	Snd Lvl	66.5	6.0	5	1.0
R12 - Business	12	1	0.0	63.8	71	63.8	15	---	63.6	0.2	5	-4.8
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	66.8	3.4	5	-1.6
R14 - Residence	14	1	0.0	68.2	66	68.2	15	Snd Lvl	59.4	8.8	5	3.8
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	64.0	8.2	5	3.2
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	64.5	6.3	5	1.3
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	63.9	4.6	5	-0.4
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	62.0	5.7	5	0.7
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	63.2	8.6	5	3.6
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	68.8	3.9	5	-1.1
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	67.1	5.0	5	0.0
R22 - Church	22	1	0.0	65.3	66	65.3	15	---	64.9	0.4	5	-4.6
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.3	3.1	5	-1.9

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	65.6	6.3	5	1.3
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	64.1	5.1	5	0.1
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	64.3	4.8	5	-0.2
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	60.5	9.0	5	4.0
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	63.6	5.8	5	0.8
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	64.9	8.0	5	3.0
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	61.9	6.9	5	1.9
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	64.9	5.3	5	0.3
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	65.8	4.3	5	-0.7
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	64.8	3.5	5	-1.5
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	62.0	4.2	5	-0.8
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	65.8	5.5	5	0.5
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	64.2	6.5	5	1.5
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	63.8	11.0	5	6.0
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	63.0	6.7	5	1.7
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.6	7.8	5	2.8
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	63.3	4.4	5	-0.6
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	65.0	7.8	5	2.8
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	63.6	6.8	5	1.8
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	63.9	6.9	5	1.9
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.7	0.8	5	-4.2
R45 - Business	45	1	0.0	66.6	71	66.6	15	---	66.6	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	71.0	66	71.0	10	Snd Lvl	63.0	8.0	5	3.0
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	66.0	4.3	5	-0.7
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	68.3	3.6	5	-1.4
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	64.7	2.8	5	-2.2
Receiver50 - Residence	51	1	0.0	71.3	66	71.3	10	Snd Lvl	66.7	4.6	5	-0.4
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	62.5	1.1	5	-3.9
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	61.3	6.3	5	1.3
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	62.5	3.8	5	-1.2
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	62.4	7.4	5	2.4
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	62.8	7.0	5	2.0
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	67.7	1.5	5	-3.5
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	63.1	5.5	5	0.5
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	59.9	7.3	5	2.3
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	64.8	5.6	5	0.6
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	63.4	5.1	5	0.1
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	62.4	3.5	5	-1.5
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	67.0	1.9	5	-3.1
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	67.0	2.1	5	-2.9

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	63.4	6.8	8	-1.2
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	5.1	11.1								
All Impacted	53	1.5	5.8	11.1								
All that meet NR Goal	36	5.0	6.9	11.1								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

30 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 10' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n dBA	Calculated	Crit'n Sub'l Inc dB			Calculated	Goal dB	
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.7	0.4	5	-4.6
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	64.4	7.5	5	2.5
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	62.0	3.9	5	-1.1
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	65.1	5.6	5	0.6
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	66.5	5.4	5	0.4
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	64.6	9.0	5	4.0
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	64.1	12.0	5	7.0
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	63.4	5.7	5	0.7
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	68.8	4.7	5	-0.3
R11 - Church	11	1	0.0	72.4	66	72.4	15	Snd Lvl	66.3	6.1	5	1.1
R12 - Business	12	1	0.0	63.4	71	63.4	15	---	63.2	0.2	5	-4.8
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	66.6	3.6	5	-1.4
R14 - Residence	14	1	0.0	68.2	66	68.2	15	Snd Lvl	59.3	8.9	5	3.9
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	63.6	8.6	5	3.6
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	64.0	6.8	5	1.8
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	63.7	4.8	5	-0.2
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	61.5	6.2	5	1.2
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	62.4	9.4	5	4.4
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	67.8	4.9	5	-0.1
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	65.4	6.7	5	1.7
R22 - Church	22	1	0.0	64.9	66	64.9	15	---	64.6	0.3	5	-4.7
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.3	3.1	5	-1.9

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	65.2	6.7	5	1.7
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	63.8	5.4	5	0.4
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	64.1	5.0	5	0.0
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	60.1	9.4	5	4.4
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	63.2	6.2	5	1.2
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	64.3	8.6	5	3.6
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	61.4	7.4	5	2.4
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	64.5	5.7	5	0.7
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	65.2	4.9	5	-0.1
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	64.7	3.6	5	-1.4
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	61.8	4.4	5	-0.6
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	65.5	5.8	5	0.8
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	63.8	6.9	5	1.9
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	63.3	11.5	5	6.5
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	62.7	7.0	5	2.0
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.5	7.9	5	2.9
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	63.1	4.6	5	-0.4
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	64.7	8.1	5	3.1
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	63.4	7.0	5	2.0
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	63.2	7.6	5	2.6
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.7	0.8	5	-4.2
R45 - Business	45	1	0.0	66.4	71	66.4	15	---	66.4	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	71.0	66	71.0	10	Snd Lvl	62.5	8.5	5	3.5
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	65.7	4.6	5	-0.4
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	66.7	5.2	5	0.2
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	64.6	2.9	5	-2.1
Receiver50 - Residence	51	1	0.0	71.3	66	71.3	10	Snd Lvl	66.2	5.1	5	0.1
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	62.4	1.2	5	-3.8
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	60.9	6.7	5	1.7
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	62.3	4.0	5	-1.0
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	61.7	8.1	5	3.1
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	62.3	7.5	5	2.5
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	67.2	2.0	5	-3.0
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	62.7	5.9	5	0.9
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	59.4	7.8	5	2.8
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	64.2	6.2	5	1.2
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	63.2	5.3	5	0.3
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	62.2	3.7	5	-1.3
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	65.9	3.0	5	-2.0
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	65.8	3.3	5	-1.7

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	63.2	7.0	8	-1.0
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	5.6	12.0								
All Impacted	53	2.0	6.3	12.0								
All that meet NR Goal	39	5.0	7.2	12.0								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

31 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 12' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dB	dB	dB	dB		dB	dB	dB	dB	
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.7	0.4	5	-4.6
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	63.2	8.7	5	3.7
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	61.5	4.4	5	-0.6
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	64.9	5.8	5	0.8
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	65.8	6.1	5	1.1
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	64.3	9.3	5	4.3
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	63.0	13.1	5	8.1
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	63.1	6.0	5	1.0
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	68.1	5.4	5	0.4
R11 - Church	11	1	0.0	72.4	66	72.4	15	Snd Lvl	66.0	6.4	5	1.4
R12 - Business	12	1	0.0	62.9	71	62.9	15	---	62.7	0.2	5	-4.8
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	66.3	3.9	5	-1.1
R14 - Residence	14	1	0.0	68.2	66	68.2	15	Snd Lvl	59.4	8.8	5	3.8
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	63.1	9.1	5	4.1
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	63.3	7.5	5	2.5
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	63.3	5.2	5	0.2
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	60.5	7.2	5	2.2
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	61.2	10.6	5	5.6
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	67.0	5.7	5	0.7
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	63.9	8.2	5	3.2
R22 - Church	22	1	0.0	64.4	66	64.4	15	---	64.0	0.4	5	-4.6
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.2	3.2	5	-1.8

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.9	66	71.9	15	Snd Lvl	64.7	7.2	5	2.2
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	63.4	5.8	5	0.8
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	63.8	5.3	5	0.3
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	59.4	10.1	5	5.1
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	62.8	6.6	5	1.6
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	63.6	9.3	5	4.3
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	60.7	8.1	5	3.1
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	63.7	6.5	5	1.5
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	63.0	7.1	5	2.1
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	64.5	3.8	5	-1.2
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	61.5	4.7	5	-0.3
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	65.2	6.1	5	1.1
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	63.2	7.5	5	2.5
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	62.5	12.3	5	7.3
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	62.3	7.4	5	2.4
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.4	8.0	5	3.0
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	61.9	5.8	5	0.8
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	64.4	8.4	5	3.4
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	63.2	7.2	5	2.2
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	61.9	8.9	5	3.9
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.6	0.9	5	-4.1
R45 - Business	45	1	0.0	66.2	71	66.2	15	---	66.2	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	71.0	66	71.0	10	Snd Lvl	61.9	9.1	5	4.1
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	65.4	4.9	5	-0.1
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	66.2	5.7	5	0.7
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	64.4	3.1	5	-1.9
Receiver50 - Residence	51	1	0.0	71.2	66	71.2	10	Snd Lvl	65.1	6.1	5	1.1
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	62.2	1.4	5	-3.6
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	60.2	7.4	5	2.4
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	61.9	4.4	5	-0.6
Receiver54 - Residence	55	1	0.0	69.8	66	69.8	10	Snd Lvl	60.3	9.5	5	4.5
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	61.6	8.2	5	3.2
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	64.7	4.5	5	-0.5
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	62.3	6.3	5	1.3
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	58.5	8.7	5	3.7
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	63.6	6.8	5	1.8
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	62.7	5.8	5	0.8
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	61.7	4.2	5	-0.8
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	64.1	4.8	5	-0.2
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	63.7	5.4	5	0.4

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	62.8	7.4	8	-0.6
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	6.2	13.1								
All Impacted	53	3.1	7.0	13.1								
All that meet NR Goal	45	5.2	7.5	13.1								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

30 October 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 15' Barriers
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h	Noise Reduction		Calculated minus Goal
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	
			dB	dB	dB	dB		dB	dB	dB	dB	
R1 - Business	1	1	0.0	67.6	71	67.6	15	---	67.6	0.0	5	-5.0
R2 - Business	2	1	0.0	66.1	71	66.1	15	---	65.6	0.5	5	-4.5
R3 - Business	3	1	0.0	71.9	71	71.9	15	Snd Lvl	62.3	9.6	5	4.6
R4 - Residence	4	1	0.0	65.9	66	65.9	15	---	60.9	5.0	5	0.0
R5 - Residence	5	1	0.0	70.7	66	70.7	15	Snd Lvl	64.7	6.0	5	1.0
R6 - Residence	6	1	0.0	71.9	66	71.9	15	Snd Lvl	65.3	6.6	5	1.6
R7 - Business	7	1	0.0	73.6	71	73.6	15	Snd Lvl	63.9	9.7	5	4.7
R8 - Business	8	1	0.0	76.1	71	76.1	15	Snd Lvl	62.1	14.0	5	9.0
R9 - Baseball Fields	9	1	0.0	69.1	66	69.1	15	Snd Lvl	62.8	6.3	5	1.3
R10 - Residence	10	1	0.0	73.5	66	73.5	15	Snd Lvl	67.2	6.3	5	1.3
R11 - Church	11	1	0.0	72.4	66	72.4	15	Snd Lvl	65.7	6.7	5	1.7
R12 - Business	12	1	0.0	62.4	71	62.4	15	---	62.1	0.3	5	-4.7
R13 - Residence	13	1	0.0	70.2	66	70.2	15	Snd Lvl	66.1	4.1	5	-0.9
R14 - Residence	14	1	0.0	68.2	66	68.2	15	Snd Lvl	58.6	9.6	5	4.6
R15 - Residence	15	1	0.0	72.2	66	72.2	15	Snd Lvl	62.6	9.6	5	4.6
R16 - Business	16	1	0.0	70.8	71	70.8	15	---	62.5	8.3	5	3.3
R17 - Business	17	1	0.0	68.5	71	68.5	15	---	63.1	5.4	5	0.4
R18 - Residence	18	1	0.0	67.7	66	67.7	15	Snd Lvl	59.0	8.7	5	3.7
R19 - Residence	19	1	0.0	71.8	66	71.8	15	Snd Lvl	59.9	11.9	5	6.9
R20 - Residence	20	1	0.0	72.7	66	72.7	15	Snd Lvl	66.0	6.7	5	1.7
R21 - Residence	21	1	0.0	72.1	66	72.1	15	Snd Lvl	61.7	10.4	5	5.4
R22 - Church	22	1	0.0	63.9	66	63.9	15	---	63.3	0.6	5	-4.4
R23 - Business	23	1	0.0	73.4	71	73.4	15	Snd Lvl	70.1	3.3	5	-1.7

RESULTS: SOUND LEVELS

KGB Centaur-Vine

R24 - Residence	24	1	0.0	71.8	66	71.8	15	Snd Lvl	64.3	7.5	5	2.5
R25 - Residence	25	1	0.0	69.2	66	69.2	15	Snd Lvl	63.0	6.2	5	1.2
R26 - Residence	26	1	0.0	69.1	66	69.1	15	Snd Lvl	63.5	5.6	5	0.6
R27 - Residence	27	1	0.0	69.5	66	69.5	15	Snd Lvl	58.5	11.0	5	6.0
R28 - Residence	28	1	0.0	69.4	66	69.4	15	Snd Lvl	62.4	7.0	5	2.0
R29 - Concrete Slab	29	1	0.0	72.9	66	72.9	15	Snd Lvl	62.8	10.1	5	5.1
R30 - Residence	30	1	0.0	68.8	66	68.8	15	Snd Lvl	59.9	8.9	5	3.9
R31 - Church	31	1	0.0	70.2	66	70.2	15	Snd Lvl	63.0	7.2	5	2.2
R32 - Residence	32	1	0.0	70.1	66	70.1	15	Snd Lvl	61.3	8.8	5	3.8
R33 - Residence	33	1	0.0	68.3	66	68.3	15	Snd Lvl	64.4	3.9	5	-1.1
R34 - Residence	34	1	0.0	66.2	66	66.2	15	Snd Lvl	61.1	5.1	5	0.1
R35 - Business	35	1	0.0	71.3	71	71.3	15	Snd Lvl	64.9	6.4	5	1.4
R36 - Residence	36	1	0.0	70.7	66	70.7	15	Snd Lvl	62.7	8.0	5	3.0
R37 - Residence	37	1	0.0	74.8	66	74.8	15	Snd Lvl	61.6	13.2	5	8.2
R38 - Residence	38	1	0.0	69.7	66	69.7	15	Snd Lvl	61.9	7.8	5	2.8
R39 - Residence	39	1	0.0	71.4	66	71.4	15	Snd Lvl	63.3	8.1	5	3.1
R40 - Residence	40	1	0.0	67.7	66	67.7	15	Snd Lvl	60.2	7.5	5	2.5
R41 - Residence	41	1	0.0	72.8	66	72.8	15	Snd Lvl	64.0	8.8	5	3.8
R42 - School/Daycare	42	1	0.0	70.4	66	70.4	15	Snd Lvl	62.9	7.5	5	2.5
R43 - Residence	43	1	0.0	70.8	66	70.8	15	Snd Lvl	60.6	10.2	5	5.2
R44 - Residence	44	1	0.0	64.5	66	64.5	15	---	63.6	0.9	5	-4.1
R45 - Business	45	1	0.0	65.9	71	65.9	15	---	65.9	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	71.0	66	71.0	10	Snd Lvl	61.2	9.8	5	4.8
Receiver47 - Residence	47	1	0.0	70.3	66	70.3	10	Snd Lvl	65.1	5.2	5	0.2
Receiver48 - Residence	48	1	0.0	71.9	66	71.9	10	Snd Lvl	65.3	6.6	5	1.6
Receiver49 - Baseball Fields	49	1	0.0	67.5	66	67.5	10	Snd Lvl	64.2	3.3	5	-1.7
Receiver50 - Residence	51	1	0.0	71.2	66	71.2	10	Snd Lvl	64.1	7.1	5	2.1
Receiver51 - Residence	52	1	0.0	63.6	66	63.6	10	---	61.5	2.1	5	-2.9
Receiver52 - Residence	53	1	0.0	67.6	66	67.6	10	Snd Lvl	59.4	8.2	5	3.2
Receiver53 - Residence	54	1	0.0	66.3	66	66.3	10	Snd Lvl	61.6	4.7	5	-0.3
Receiver54 - Residence	55	1	0.0	69.7	66	69.7	10	Snd Lvl	59.0	10.7	5	5.7
Receiver55 - Residence	56	1	0.0	69.8	66	69.8	10	Snd Lvl	61.0	8.8	5	3.8
Receiver56 - Residence	57	1	0.0	69.2	66	69.2	10	Snd Lvl	62.2	7.0	5	2.0
Receiver57 - Residence	58	1	0.0	68.6	66	68.6	10	Snd Lvl	61.8	6.8	5	1.8
Receiver58 - Residence	59	1	0.0	67.2	66	67.2	10	Snd Lvl	57.3	9.9	5	4.9
Receiver59 - Residence	60	1	0.0	70.4	66	70.4	10	Snd Lvl	63.0	7.4	5	2.4
Receiver60 - Residence	61	1	0.0	68.5	66	68.5	10	Snd Lvl	62.3	6.2	5	1.2
Receiver61 - Residence	62	1	0.0	65.9	66	65.9	10	---	61.4	4.5	5	-0.5
Receiver62 - Residence	64	1	0.0	68.9	66	68.9	10	Snd Lvl	63.2	5.7	5	0.7
Receiver63 - Residence	65	1	0.0	69.1	66	69.1	10	Snd Lvl	62.1	7.0	5	2.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver64 - Residence	66	1	0.0	70.2	66	70.2	10	Snd Lvl	62.3	7.9	8	-0.1
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	64	0.0	6.8	14.0								
All Impacted	53	3.3	7.7	14.0								
All that meet NR Goal	50	5.0	8.0	14.0								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

18 November 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 NE "Contours"
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver

Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				Type Impact	With Barrier			
				LAeq1h		Increase over existing			Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n dBA	Calculated	Crit'n Sub'l Inc dB			Calculated	Goal dB	
Receiver72	72	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
Receiver73	73	1	0.0	70.9	66	70.9	10	Snd Lvl	70.9	0.0	8	-8.0
Receiver74	74	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	8	-8.0
Receiver75	75	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
Receiver76	76	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Receiver77	77	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
Receiver78	78	1	0.0	65.6	66	65.6	10	---	65.6	0.0	8	-8.0
Receiver79	79	1	0.0	64.9	66	64.9	10	---	64.9	0.0	8	-8.0
Receiver80	80	1	0.0	64.3	66	64.3	10	---	64.3	0.0	8	-8.0
Receiver81	81	1	0.0	63.7	66	63.7	10	---	63.7	0.0	8	-8.0
Receiver82	82	1	0.0	74.6	66	74.6	10	Snd Lvl	74.6	0.0	8	-8.0
Receiver83	83	1	0.0	72.7	66	72.7	10	Snd Lvl	72.7	0.0	8	-8.0
Receiver84	84	1	0.0	71.0	66	71.0	10	Snd Lvl	71.0	0.0	8	-8.0
Receiver85	85	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Receiver86	86	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
Receiver87	87	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
Receiver88	88	1	0.0	67.0	66	67.0	10	Snd Lvl	67.0	0.0	8	-8.0
Receiver89	89	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Receiver90	90	1	0.0	65.8	66	65.8	10	---	65.8	0.0	8	-8.0
Receiver91	91	1	0.0	65.3	66	65.3	10	---	65.3	0.0	8	-8.0
Receiver92	92	1	0.0	74.1	66	74.1	10	Snd Lvl	74.1	0.0	8	-8.0
Receiver93	93	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
Receiver94	94	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	8	-8.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver95	95	1	0.0	70.5	66	70.5	10	Snd Lvl	70.5	0.0	8	-8.0
Receiver96	96	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0
Receiver97	97	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
Receiver98	98	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
Receiver99	99	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Receiver100	100	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
Receiver101	101	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
Receiver102	102	1	0.0	73.3	66	73.3	10	Snd Lvl	73.3	0.0	8	-8.0
Receiver103	103	1	0.0	71.8	66	71.8	10	Snd Lvl	71.8	0.0	8	-8.0
Receiver104	104	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
Receiver105	105	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0
Receiver106	106	1	0.0	68.7	66	68.7	10	Snd Lvl	68.7	0.0	8	-8.0
Receiver107	107	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	8	-8.0
Receiver108	108	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Receiver109	109	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
Receiver110	110	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
Receiver111	111	1	0.0	65.5	66	65.5	10	---	65.5	0.0	8	-8.0
Receiver112	112	1	0.0	72.8	66	72.8	10	Snd Lvl	72.8	0.0	8	-8.0
Receiver113	113	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
Receiver114	114	1	0.0	69.6	66	69.6	10	Snd Lvl	69.6	0.0	8	-8.0
Receiver115	115	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	8	-8.0
Receiver116	116	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	8	-8.0
Receiver117	117	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
Receiver118	118	1	0.0	65.6	66	65.6	10	---	65.6	0.0	8	-8.0
Receiver119	119	1	0.0	64.9	66	64.9	10	---	65.0	-0.1	8	-8.1
Receiver120	120	1	0.0	64.3	66	64.3	10	---	64.4	-0.1	8	-8.1
Receiver121	121	1	0.0	63.8	66	63.8	10	---	63.8	0.0	8	-8.0
Receiver122	122	1	0.0	72.6	66	72.6	10	Snd Lvl	72.6	0.0	8	-8.0
Receiver123	123	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	8	-8.0
Receiver124	124	1	0.0	69.3	66	69.3	10	Snd Lvl	69.3	0.0	8	-8.0
Receiver125	125	1	0.0	68.2	66	68.2	10	Snd Lvl	68.2	0.0	8	-8.0
Receiver126	126	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	8	-8.0
Receiver127	127	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	8	-8.0
Receiver128	128	1	0.0	65.7	66	65.7	10	---	65.7	0.0	8	-8.0
Receiver129	129	1	0.0	65.0	66	65.0	10	---	65.0	0.0	8	-8.0
Receiver130	130	1	0.0	64.5	66	64.5	10	---	64.5	0.0	8	-8.0
Receiver131	131	1	0.0	63.9	66	63.9	10	---	63.9	0.0	8	-8.0
Receiver132	132	1	0.0	72.4	66	72.4	10	Snd Lvl	72.4	0.0	8	-8.0
Receiver133	133	1	0.0	70.6	66	70.6	10	Snd Lvl	70.6	0.0	8	-8.0
Receiver134	134	1	0.0	69.2	66	69.2	10	Snd Lvl	69.2	0.0	8	-8.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver135	135	1	0.0	68.1	66	68.1	10	Snd Lvl	68.1	0.0	8	-8.0
Receiver136	136	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	8	-8.0
Receiver137	137	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	8	-8.0
Receiver138	138	1	0.0	65.5	66	65.5	10	---	65.5	0.0	8	-8.0
Receiver139	139	1	0.0	64.9	66	64.9	10	---	64.9	0.0	8	-8.0
Receiver140	140	1	0.0	64.3	66	64.3	10	---	64.3	0.0	8	-8.0
Receiver141	141	1	0.0	63.7	66	63.7	10	---	63.7	0.0	8	-8.0
Dwelling Units	# DUs	Noise Reduction										
		Min	Avg	Max								
		dB	dB	dB								
All Selected	70	-0.1	0.0	0.0								
All Impacted	51	0.0	0.0	0.0								
All that meet NR Goal	0	0.0	0.0	0.0								

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

18 November 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT: KGB Centaur-Vine
RUN: 4 and 6-Lane 2039 SW "Contours"
BARRIER DESIGN: INPUT HEIGHTS

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

ATMOSPHERICS: 68 deg F, 50% RH

Receiver												
Name	No.	#DUs	Existing LAeq1h dBA	No Barrier				With Barrier				
				LAeq1h		Increase over existing		Type Impact	Calculated LAeq1h dBA	Noise Reduction		Calculated minus Goal dBA
				Calculated	Crit'n dBA	Calculated	Crit'n Sub'l Inc dB			Calculated	Goal dB	
Receiver142	142	1	0.0	73.0	66	73.0	10	Snd Lvl	72.9	0.1	8	-7.9
Receiver143	143	1	0.0	71.0	66	71.0	10	Snd Lvl	71.1	-0.1	8	-8.1
Receiver144	144	1	0.0	69.5	66	69.5	10	Snd Lvl	69.7	-0.2	8	-8.2
Receiver145	145	1	0.0	68.3	66	68.3	10	Snd Lvl	68.5	-0.2	8	-8.2
Receiver146	146	1	0.0	67.3	66	67.3	10	Snd Lvl	67.5	-0.2	8	-8.2
Receiver147	147	1	0.0	66.4	66	66.4	10	Snd Lvl	66.7	-0.3	8	-8.3
Receiver148	148	1	0.0	65.6	66	65.6	10	---	66.0	-0.4	8	-8.4
Receiver149	149	1	0.0	65.0	66	65.0	10	---	65.3	-0.3	8	-8.3
Receiver150	150	1	0.0	64.4	66	64.4	10	---	64.8	-0.4	8	-8.4
Receiver151	151	1	0.0	63.8	66	63.8	10	---	64.2	-0.4	8	-8.4
Receiver152	152	1	0.0	73.0	66	73.0	10	Snd Lvl	73.0	0.0	8	-8.0
Receiver153	153	1	0.0	71.1	66	71.1	10	Snd Lvl	71.2	-0.1	8	-8.1
Receiver154	154	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Receiver155	155	1	0.0	68.4	66	68.4	10	Snd Lvl	68.6	-0.2	8	-8.2
Receiver156	156	1	0.0	67.4	66	67.4	10	Snd Lvl	67.6	-0.2	8	-8.2
Receiver157	157	1	0.0	66.5	66	66.5	10	Snd Lvl	66.8	-0.3	8	-8.3
Receiver158	158	1	0.0	65.8	66	65.8	10	---	66.1	-0.3	8	-8.3
Receiver159	159	1	0.0	65.1	66	65.1	10	---	65.4	-0.3	8	-8.3
Receiver160	160	1	0.0	64.4	66	64.4	10	---	64.8	-0.4	8	-8.4
Receiver161	161	1	0.0	63.9	66	63.9	10	---	64.3	-0.4	8	-8.4
Receiver162	162	1	0.0	73.0	66	73.0	10	Snd Lvl	73.0	0.0	8	-8.0
Receiver163	163	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
Receiver164	164	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

Receiver165	165	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	8	-8.0
Receiver166	166	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	8	-8.0
Receiver167	167	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	8	-8.0
Receiver168	168	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	8	-8.0
Receiver169	169	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
Receiver170	170	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
Receiver171	171	1	0.0	64.2	66	64.2	10	----	64.2	0.0	8	-8.0
Receiver172	172	1	0.0	72.4	66	72.4	10	Snd Lvl	72.4	0.0	8	-8.0
Receiver173	173	1	0.0	70.5	66	70.5	10	Snd Lvl	70.4	0.1	8	-7.9
Receiver174	174	1	0.0	69.0	66	69.0	10	Snd Lvl	68.8	0.2	8	-7.8
Receiver175	175	1	0.0	67.7	66	67.7	10	Snd Lvl	67.5	0.2	8	-7.8
Receiver176	176	1	0.0	66.6	66	66.6	10	Snd Lvl	66.3	0.3	8	-7.7
Receiver177	177	1	0.0	65.6	66	65.6	10	---	65.4	0.2	8	-7.8
Receiver178	178	1	0.0	64.8	66	64.8	10	---	64.6	0.2	8	-7.8
Receiver179	179	1	0.0	64.1	66	64.1	10	----	63.8	0.3	8	-7.7
Receiver180	180	1	0.0	63.5	66	63.5	10	----	63.2	0.3	8	-7.7
Receiver181	181	1	0.0	62.9	66	62.9	10	---	62.6	0.3	8	-7.7
Receiver182	182	1	0.0	73.5	66	73.5	10	Snd Lvl	73.5	0.0	8	-8.0
Receiver183	183	1	0.0	71.5	66	71.5	10	Snd Lvl	71.5	0.0	8	-8.0
Receiver184	184	1	0.0	70.0	66	70.0	10	Snd Lvl	70.0	0.0	8	-8.0
Receiver185	185	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	8	-8.0
Receiver186	186	1	0.0	67.8	66	67.8	10	Snd Lvl	67.8	0.0	8	-8.0
Receiver187	187	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	8	-8.0
Receiver188	188	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	8	-8.0
Receiver189	189	1	0.0	65.4	66	65.4	10	----	65.4	0.0	8	-8.0
Receiver190	190	1	0.0	64.8	66	64.8	10	----	64.8	0.0	8	-8.0
Receiver191	191	1	0.0	64.3	66	64.3	10	----	64.3	0.0	8	-8.0
Receiver192	192	1	0.0	72.9	66	72.9	10	Snd Lvl	72.9	0.0	8	-8.0
Receiver193	193	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	8	-8.0
Receiver194	194	1	0.0	69.7	66	69.7	10	Snd Lvl	69.7	0.0	8	-8.0
Receiver195	195	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	8	-8.0
Receiver196	196	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	8	-8.0
Receiver197	197	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	8	-8.0
Receiver198	198	1	0.0	65.8	66	65.8	10	----	65.8	0.0	8	-8.0
Receiver199	199	1	0.0	65.2	66	65.2	10	----	65.2	0.0	8	-8.0
Receiver200	200	1	0.0	64.5	66	64.5	10	----	64.5	0.0	8	-8.0
Receiver201	211	1	0.0	63.9	66	63.9	10	----	63.9	0.0	8	-8.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB

RESULTS: SOUND LEVELS

KGB Centaur-Vine

All Selected	60	-0.4	0.0	0.3
All Impacted	37	-0.3	0.0	0.3
All that meet NR Goal	0	0.0	0.0	0.0

RESULTS: SOUND LEVELS

KGB Centaur-Vine

DOT&PF
RRH

18 December 2014
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

KGB Centaur-Vine

4 and 6-Lane 2039 B1 Only 0' Barrier

BARRIER DESIGN:

INPUT HEIGHTS

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

ATMOSPHERICS:

68 deg F, 50% RH

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier		Increase over existing		Type Impact	With Barrier		Calculated minus Goal	
				LAeq1h	Crit'n	Calculated	Crit'n Sub'l Inc		Calculated LAeq1h	Noise Reduction		
			dBA	dBA	dBA	dBA	dBA		dBA	dB	dB	
R4 - Residence	4	1	0.0	72.3	66	72.3	15	Snd Lvl	72.3	0.0	5	-5.0
Receiver46 - Residence	46	1	0.0	70.7	66	70.7	10	Snd Lvl	70.7	0.0	5	-5.0
Dwelling Units		# DUs	Noise Reduction									
			Min	Avg	Max							
			dB	dB	dB							
All Selected		2	0.0	0.0	0.0							
All Impacted		2	0.0	0.0	0.0							
All that meet NR Goal		0	0.0	0.0	0.0							

RESULTS: SOUND LEVELS

KGB Centaur-Vine

**DOT&PF
RRH**

**18 December 2014
TNM 2.5
Calculated with TNM 2.5**

RESULTS: SOUND LEVELS

PROJECT/CONTRACT:

KGB Centaur-Vine

RUN:

4 and 6-Lane 2039 B1 Only 5' Barrier

BARRIER DESIGN:

INPUT HEIGHTS

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

ATMOSPHERICS:

68 deg F, 50% RH

Receiver		Increase over existing										With Barrier		Noise Reduction		Calculated minus Goal		
Name	No.	#DUs	Existing LAeq1h	No Barrier		Type Impact	Calculated	Crit'n	Sub'l Inc	dB	dB	dBA	Calculated LAeq1h	dB	Calculated	Goal	dB	dB
				LAeq1h	Calculated													
R4 - Residence	4	1	0.0	65.2	66	15	65.2	66	65.2	65.2	65.2	65.2	65.2	0.0	5	5	-5.0	-5.0
Receiver46 - Residence	46	1	0.0	67.3	66	10	67.3	66	67.3	67.3	67.3	67.3	67.3	0.0	5	5	-5.0	-5.0
Dwelling Units		# DUs	Noise Reduction															
			Min	Avg	Max													
			dB	dB	dB													
All Selected		2	0.0	0.0	0.0													
All Impacted		1	0.0	0.0	0.0													
All that meet NR Goal		0	0.0	0.0	0.0													

Appendix C:

Noise Abatement Recommendation Worksheets

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R1

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 63

Future Build Noise Level (L_{eq}): 68

Future No-Build Noise Level: 69

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible?	Yes	No	<input checked="" type="radio"/> N/A
Is the proposed noise abatement measure engineering feasible?	Yes	No	<input checked="" type="radio"/> N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable?	Yes	No	<input checked="" type="radio"/> N/A
--	-----	----	--------------------------------------

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? N/A

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? N/A

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? N/A

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
N/A

What is the basis for this recommendation?

No impact anticipated.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R2

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 60

Future Build Noise Level (L_{eq}): 66

Future No-Build Noise Level: 65

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? N/A

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? N/A

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? N/A

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)

N/A

What is the basis for this recommendation?

No impact anticipated.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R3

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 69

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R4

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 59

Future Build Noise Level (L_{eq}): 66

Future No-Build Noise Level: 64

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? Yes.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? No survey conducted yet.

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? Yes.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefited receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefited receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? Yes.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer) Noise Barriers (7' height) as shown on the Project Map (Appendix B).

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement are met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost-constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R5

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 60

Future Build Noise Level (L_{eq}): 70

Future No-Build Noise Level: 69

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R6

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? Yes.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? No survey conducted yet.

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? Yes.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? Yes.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer) Noise Barriers (15' height) as shown on the Project Map (Appendix B).

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement are met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R7

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 70

Future Build Noise Level (L_{eq}): 74

Future No-Build Noise Level: 75

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R8

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 71

Future Build Noise Level (L_{eq}): 76

Future No-Build Noise Level: 75

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

While feasibility criteria for noise abatement are met in this location, Reasonability criteria are not. Therefore no abatement measures are recommended.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R9

Location/Description: See Map

Activity Category type: Baseball fields

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 69

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R10

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 69

Future Build Noise Level (L_{eq}): 73

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R11

Location/Description: See Map

Activity Category type: Church

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 67

Future Build Noise Level (L_{eq}): 73

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R12

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 66

Future Build Noise Level (L_{eq}): 66

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

- 1 Cost Effectiveness.** Is the abatement measure cost effective? N/A
- 2 Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A
- 3 Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? N/A

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

- 4 Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?
- 5 Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?
- 6 Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?
- 7 Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?
- 8 Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?
- 9 Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? N/A

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
N/A

What is the basis for this recommendation?

No impact anticipated.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R13

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefited receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefited receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R14

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 62

Future Build Noise Level (L_{eq}): 68

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R15

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 51

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R16

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 54

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R17

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 69

Future No-Build Noise Level: 68

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible?	Yes	No	<input checked="" type="radio"/> N/A
Is the proposed noise abatement measure engineering feasible?	Yes	No	<input checked="" type="radio"/> N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable?	Yes	No	<input checked="" type="radio"/> N/A
--	-----	----	--------------------------------------

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? N/A

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? N/A

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? N/A

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
N/A

What is the basis for this recommendation?

No impact anticipated.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R18

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 63

Future Build Noise Level (L_{eq}): 68

Future No-Build Noise Level: 67

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R19

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 66

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R20

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 68

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

- 1 Cost Effectiveness.** Is the abatement measure cost effective? No.
- 2 Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A
- 3 Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

- 4 Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?
- 5 Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?
- 6 Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?
- 7 Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?
- 8 Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?
- 9 Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R21

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R22

Location/Description: See Map

Activity Category type: Church

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 56

Future Build Noise Level (L_{eq}): 66

Future No-Build Noise Level: 66

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R23

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 57

Future Build Noise Level (L_{eq}): 74

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R24

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R25

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 63

Future Build Noise Level (L_{eq}): 69

Future No-Build Noise Level: 69

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R26

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 70

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R27

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 66

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefited receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefited receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R28

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

- 1 Cost Effectiveness.** Is the abatement measure cost effective? Yes.
- 2 Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? No survey conducted yet.
- 3 Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? Yes.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

- 4 Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?
- 5 Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?
- 6 Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?
- 7 Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?
- 8 Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?
- 9 Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? Yes.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
Noise Barriers (12' height) as shown on the Project Map (Appendix B).

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement are met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R29

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 66

Future Build Noise Level (L_{eq}): 73

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

- 1 Cost Effectiveness.** Is the abatement measure cost effective? No.
- 2 Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A
- 3 Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

- 4 Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?
- 5 Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?
- 6 Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?
- 7 Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?
- 8 Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?
- 9 Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R30

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 70

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R31

Location/Description: See Map

Activity Category type: Church

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 70

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R32

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 70

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R33

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 64

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R34

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 63

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R35

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 66

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R36

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R37

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 68

Future Build Noise Level (L_{eq}): 75

Future No-Build Noise Level: 74

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R38

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R39

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 66

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R40

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 63

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 70

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R41

Location/Description: See Map

Activity Category type: School/Daycare

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 67

Future Build Noise Level (L_{eq}): 73

Future No-Build Noise Level: 73

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer’s signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R42

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 61

Future Build Noise Level (L_{eq}): 71

Future No-Build Noise Level: 71

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefited receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefited receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R43

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 60

Future Build Noise Level (L_{eq}): 72

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefited receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefited receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R44

Location/Description: See Map

Activity Category type: Residence

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table IDOT&PF Noise Policy): 67

Existing Noise Level (L_{eq}): 57

Future Build Noise Level (L_{eq}): 68

Future No-Build Noise Level: 68

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 **Cost Effectiveness.** Is the abatement measure cost effective? No.

2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 **Noise reduction design goal?** Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 **Absolute Predicted Build Noise Level.** Are the predicted future noise levels at least 66dBA?

7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 **Build vs. No-Build Levels.** Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 **Land Use.** Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Feasibility and Reasonableness Worksheet

HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s): R45

Location/Description: See Map

Activity Category type: Business

Noise Abatement Criteria for this Activity Category (L_{eq}) (Table 1DOT&PF Noise Policy): 72

Existing Noise Level (L_{eq}): 65

Future Build Noise Level (L_{eq}): 73

Future No-Build Noise Level: 72

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible? Yes No N/A

Is the proposed noise abatement measure engineering feasible? Yes No N/A

Reasonableness

Is the proposed noise abatement measure considered reasonable? Yes No N/A

Federal Mandatory Factors

1 Cost Effectiveness. Is the abatement measure cost effective? No.

2 Views of Benefited Residents and Property Owners. Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement? N/A

3 Noise reduction design goal? Does the noise abatement measure provide a 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures? No.

DOT&PF Mandatory Factors (State funded only) N/A for all (Federal project).

4 Development vs. Highway Timing. Were at least 50 percent of benefitted receptors in the development built before highway construction?

5 Development Existence. Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?

6 Absolute Predicted Build Noise Level. Are the predicted future noise levels at least 66dBA?

7 Relative Predicted Build Noise Level. Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?

8 Build vs. No-Build Levels. Are the future build noise levels at least 5 dBA greater than the future No-Build noise levels?

9 Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Is Noise Abatement recommended for this impacted receptor(s)? No.

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal-Aid projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)
None.

What is the basis for this recommendation?

Feasibility and Reasonability criteria for noise abatement not met in this location.

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavements to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer¹¹

Date

¹¹ The Preconstruction Engineer's signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation.

Appendix D:
DOT&PF Noise Policy

Alaska Department of Transportation & Public Facilities
Alaska Environmental Procedures Manual

Noise Policy

April 2011



STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION
AND PUBLIC FACILITIES
STATEWIDE DESIGN & ENGINEERING SERVICES DIVISION

SEAN PARNELL, GOVERNOR

3132 CHANNEL DRIVE
P.O. Box 112500
JUNEAU, ALASKA 99811-2500
PHONE: (907) 465-6958
FAX: (907) 465-2460

April 14, 2011

Mr. David Miller
Division Administrator
Federal Highway Administration
Alaska Division
709 West 9th Street, Rm 851
P.O. Box 21648
Juneau, AK 99802

Reference: DOT&PF Noise Policy

Dear Mr. Miller:

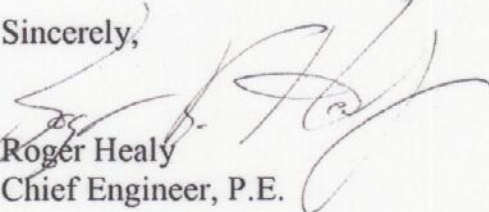
The Alaska Department of Transportation and Public Facilities (ADOT&PF) hereby submits a copy of the DOT&PF Noise Policy dated April 2001 for review and approval by the Federal Highway Administration Alaska Division. We would like to thank your staff and Mark Ferroni of your Washington D.C. office for your review and comments on previous drafts. These comments have been incorporated into this version of the document. This policy is in response to changes in 23 CFR 772. It is our intent that this noise policy will go into effect upon your approval of this policy.

Your approval of the attached noise policy is hereby requested. If you have any questions or wish to discuss this further do not hesitate to contact Ben White of my office.

Approved: _____


(David Miller, Division Administrator, FHWA Alaska Division)

Sincerely,


Roger Healy
Chief Engineer, P.E.

Enclosure: DOT&PF Noise Policy (April 2011)

"Providing for the safe movement of people and goods and the delivery of state services."

INTRODUCTION

This document contains the Alaska Department of Transportation and Public Facilities (DOT&PF) noise policy on highway traffic noise and construction noise. This policy describes DOT&PF's implementation of the requirements of the Federal Highway Administration (FHWA) Noise Standard at 23 Code of Federal Regulations (CFR) Part 772 (see Appendix A). This policy also addresses how traffic noise is considered on state funded projects. It applies to both design-build and design-bid-build projects. DOT&PF developed this policy and submitted it to FHWA for their review and concurrence.

Noise is defined as unwanted sound. Sound is produced by the vibration of sound pressure waves in the air. Sound pressure levels are used to measure the intensity of sound and are described in terms of decibels. The decibel (dB) is a logarithmic unit which expresses the ratio of the sound pressure level being measured to a standard reference level. Sound is composed of various frequencies, but the human ear does not respond to all frequencies. Frequencies to which the human ear does not respond must be filtered out when measuring highway noise levels. Since noise is measured on a logarithmic scale, an increase 10 dB in the sound pressure level will be perceived by an observer to be a doubling of the sound whereas a decrease in 10 dB will be perceived as a halving of the sound. For example, a sound at 70 dB will be perceived as twice as loud as a sound at 60 dB.

The level of highway traffic noise depends on three things: (1) the volume of the traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of the traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher speeds, and greater numbers of trucks. Vehicle noise is a combination of the noises produced by the engine, exhaust, and tires. The loudness of traffic noise can also be increased by defective mufflers or other faulty equipment on vehicles. Any condition (such as a steep incline) that causes heavy laboring of motor vehicle engines will also increase traffic noise levels. In addition, there are other more complicated factors that affect the loudness of traffic noise. For example, as a person moves away from a highway, traffic noise levels are reduced by distance, terrain, vegetation, and natural and manmade obstacles. While traffic noise is not usually a problem for people who live more than about 450 feet (150 meters) from heavily traveled freeways or more than about 90-180 feet (30 to 60 meters) from lightly traveled roads) there may be incidences (ex. quiet settings, rural areas, etc.) where people can detect highway noise over greater distances.

During the rapid expansion of the Interstate Highway System and other roadways in the 20th century, communities began to recognize that highway traffic noise and construction noise had become important environmental impacts. In the 1972 Federal-aid Highway Act, Congress required FHWA to develop a noise standard for new federal-aid highway projects. While providing national criteria and requirements for all highway agencies, the FHWA Noise Standard gives highway agencies flexibility that reflects state-specific attitudes and objectives in approaching the problem of highway traffic and

construction noise. This policy contains DOT&PF's policy on how highway traffic and construction noise impacts are defined, how noise abatement is evaluated, and how noise abatement decisions are made.

In addition to defining traffic noise impacts, the FHWA Noise Standard requires that noise abatement measures be considered when traffic noise impacts are identified for Type I federal projects, as defined in 23 CFR 772.5. For a more detailed definition of a Type I project see the definitions section of this policy. Noise abatement measures that are found to be feasible and reasonable must be constructed for Type I federal projects. Feasible and reasonable noise abatement measures are eligible for federal-aid participation at the same ratio or percentage as other eligible project costs. The DOT&PF has accepted the federal definition of a Type I project for all state-funded projects as well.

Federal regulations also include standards for Type II federal projects. A Type II federal project is defined as a federal or federal-aid highway project for noise abatement on an existing highway. For a Type II project to be eligible for federal-aid funding, the state highway agency must develop and implement a Type II program in accordance with 23 CFR 772.7(e). Type II programs are entirely voluntary. The DOT&PF has elected not to participate in a Type II program to retrofit existing state highways with noise abatement.

Type III federal projects are those that neither meet the definitions of Type I or Type II and for which a noise analysis is not required and no consideration of noise abatement is warranted. The DOT&PF has accepted the federal definition of a Type III projects for all state-funded projects as well.

PURPOSE

This policy describes the DOT&PF program to implement 23 CFR 772. Where FHWA has given DOT&PF flexibility in implementing the standard, this policy describes the DOT&PF approach to implementation. This policy also defines how the DOT&PF addresses traffic noise in the design and construction of state-funded projects.

NOISE STANDARDS

This policy outlines the DOT&PF program to implement the FHWA Noise Standards found in 23 CFR 772. It also describes how the DOT&PF addresses traffic noise on state-funded projects. These standards include traffic noise prediction requirements, noise analyses, noise abatement criteria, and requirements for informing local officials.

The State of Alaska does not have any traffic noise regulations. It is the DOT&PF policy to follow the federal standards for traffic noise prediction requirements, and noise analyses. Federal noise abatement criteria are followed to determine whether noise

impacts exist and if abatement is feasible and reasonable, however, the decision to provide noise abatement on state funded project follows slightly different procedures (discussed the section of this policy entitled *State-Funded Projects*).

DEFINITIONS

The federal noise regulations definitions are located at 23 CFR 772.5. These regulations are located in Appendix A.

Benefited Receptor. The recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dBA

Common Noise Environment. A group of receptors within the same Activity Category in Table 1 that are exposed to similar noise sources and levels; traffic volumes, traffic mix, and speed; and topographic features. Generally, common noise environments occur between two secondary noise sources such as interchanges, intersections, and cross-roads.

Date of Public Knowledge. The date of approval of the Categorical Exclusion (CE), the Finding of No Significant Impact (FONSI) the Record of Decision (ROD), or in the case of a state-funded project, approval of the State Environmental Checklist.

Design Year. The future year used to estimate the probable traffic volume for which a highway is designed.

Existing Noise Levels: The worst noise hour, resulting from the combination of natural and mechanical sources and human activity, usually present in a particular area. It should be for the existing year of analysis.

Feasibility: The combination of acoustical and engineering factors considered in the evaluation of a noise abatement measure.

Federal-aid Project: Any project utilizing federal funds for one or more phases (i.e., Environmental, Design, Right of Way, or Construction) or that is otherwise subject to federal approval.

First Row Receivers: Closest residences or business impacted by noise from the highway facility.

Impacted Receptor: The recipient that has a traffic noise impact.

L10: The sound level that is exceeded 10 percent of the time (the 90th percentile) for the period under consideration, with L10(h) being the hourly value of L10.

Leq: The equivalent steady-state sound level which in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period, with $Leq(h)$ being the hourly value of Leq .

Multifamily Dwelling: A residential structure containing more than one residence. Each residence in a multifamily dwelling shall be counted as one receptor when determining impacted receptors and benefited receptors.

Noise Barrier: A physical obstruction constructed between the highway noise source and the noise sensitive receptor(s) that lowers the noise level, including stand alone noise walls, noise berms (earth or other material), and combination berm/wall systems.

Noise Reduction Design Goal: The optimum desired dBA noise reduction determined from calculating the difference between future build noise levels with abatement, to future build noise levels without abatement. The noise reduction design goal of the DOT&PF is 7dBA.

Permitted: A definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit.

Property Owner: An individual or group of individuals that holds a title, deed, or other legal documentation of ownership of a property or a residence.

Reasonableness: The combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure.

Receptor: A discrete or representative location of a noise sensitive area(s), for any of the land uses listed in Table 1.

Residence: A dwelling unit, either a single family residence or each dwelling unit in a multifamily dwelling.

Resident: Someone who resides at a dwelling unit. May not necessarily be the owner of the dwelling unit.

State-funded project: A project that is solely funded by state monies appropriated by the Alaska State Legislature and requires no federal approvals for implementation.

Statement of Likelihood: A statement provided in the environmental clearance document based on the feasibility and reasonableness analysis completed at the time the environmental document is being approved.

Substantial Construction: The granting of a building permit, prior to right-of-way acquisition or construction approval, for the highway.

Substantial noise increase: One of two types of highway traffic noise impacts. For a Type I project, DOT&PF considers an increase in noise levels of 15 dBA in the design year over the existing noise level to be a substantial noise increase.

Traffic Noise Impacts: Design year build condition noise levels that approach or exceed the NAC listed in Table 1 in 23 CFR 772 for the future build condition; or design year build condition noise levels that create a substantial noise increase over existing noise levels. The DOT&PF defines “approach” as 1 dBA below the FHWA noise abatement criteria and a “substantial” noise increase as a 15 dBA increase over existing noise levels.

Type I Project:

- (1) The construction of a highway on new location; or,
- (2) The physical alteration of an existing highway where there is either:
 - (i) Substantial Horizontal Alteration. A project that halves the distance between the traffic noise source and the closest receptor between the existing condition to the future build condition; or,
 - (ii) Substantial Vertical Alteration. A project that removes shielding therefore exposing the line-of-sight between the receptor and the traffic noise source.
This is done by either altering the vertical alignment of the highway or by altering the topography between the highway traffic noise source and the receptor; or,
- (3) The addition of a through-traffic lane(s). This includes the addition of a through-traffic lane that functions as a HOV lane, High-Occupancy Toll (HOT) lane, bus lane, or truck climbing lane; or,
- (4) The addition of an auxiliary lane, except when the auxiliary lane is a turn lane; or,
- (5) The addition or relocation of interchange lanes or ramps added to a quadrant to complete an existing partial interchange; or,
- (6) Restriping existing pavement for the purpose of adding a through-traffic lane or an auxiliary lane; or,
- (7) The addition of a new or substantial alteration of a weigh station, rest stop, ride-share lot or toll plaza.
- (8) If a project is determined to be a Type I project under this definition, the entire project area as defined in the environmental document is a Type I project.

Type II Project: For a Type II project to be eligible for federal-aid funding, the highway agency must develop and implement a Type II program in accordance with section

772.7(e). The DOT&PF has elected not to participate in the voluntary Type II program at this time¹, so the retrofitting of noise barriers on existing roads is not currently done.

Type III Project: A federal or federal aid highway project that does not meet the classifications of a Type I or Type II project. Type III projects do not require a noise analysis or consideration of noise Abatement.

APPLICABILITY

This DOT&PF policy applies to all Type I federal highway projects in the State of Alaska, that is, any projects that receive federal-aid funds or are otherwise subject to FHWA approval. They include federal projects that are administered by Local Public Agencies (LPAs) as well as DOT&PF.

This policy also applies to all Type I state-funded projects, and all Type I projects proposed by Toll Road Authorities in the State of Alaska. Presently, the Knik Arm Crossing Toll Authority (KABATA) is the only such authority in the State². This policy applies to state-funded design-build and design-bid-build projects. This policy does not apply to Type III state-funded maintenance and operations activities and projects. In general, the same methods are followed in the identification of noise impacts for state-funded projects as with federal-aid projects. For state-funded projects, results of noise analyses will be documented in the State Projects Environmental Checklist. If noise abatement is determined to be feasible and reasonable, the Regional Environmental Manager will make a noise abatement recommendation to the Preconstruction Engineer. The Preconstruction Engineer will decide whether the recommended abatement measure will be constructed on state-funded projects. Abatement will be provided only if it meets the feasibility and reasonableness criteria of this policy and the state-funded appropriation can accommodate this expenditure.

The requirements of this policy apply uniformly and consistently to all Type I federal projects, Type I state-funded projects, and Type I Toll Authority projects within the State of Alaska.

DOT&PF has elected not to participate in the voluntary Type II noise program. Consequently, the retrofitting of existing roads with noise abatement is not done by the Department, unless there is a special appropriation by the State Legislature for such abatement and the Department is designated the responsible agency for the project. In those cases, the noise abatement measures being proposed must meet the feasibility

¹ The Knik Arm Crossing Toll Authority (KABATA) has developed a PA that indicates that if Noise Abatement Criteria are exceeded then there will be noise barriers retrofitted to the project.

² Projects that come out of KABATA are state-funded, they follow the noise abatement procedures for State-funded projects, whereas if they are federally funded, they follow the procedures for federal projects.

and reasonableness criteria of this policy. Any disputes with this provision of the policy and state lawmakers should be resolved by the DOT&PF Commissioner.

Type III projects are those projects that neither meet the definition of a Type I or Type II project nor require a noise analysis or consideration of noise abatement.

If there are any questions about whether a project is subject to this policy or the FHWA Noise Standard, contact the Regional Environmental Manager. Disagreements on these determinations should be directed to the Statewide Environmental Manager. Due to the long lead time necessary to complete a traffic noise study, the need for a noise study should be determined early in project scoping.

TRAFFIC NOISE PREDICTION

The most recent version of the FHWA Traffic Noise Model (TNM), or other model found acceptable to FHWA, pursuant to 23 CFR 772.9, will be utilized for all noise predictions. The use of TNM Look-up Tables or any other model unacceptable to FHWA is prohibited. Existing noise levels and future design year noise levels must be predicted for all reasonable build alternatives carried forward in the National Environmental Policy Act (NEPA) document. The future design year noise levels for the No-Build alternative must also be predicted to satisfy documentation requirements of NEPA.

The average pavement type must be used for all noise predictions unless the DOT&PF obtains FHWA approval to use a different pavement type.

The use of noise contour lines can only be used for project alternative screening or for land use planning purposes. Noise contour lines cannot be used for determining traffic noise impacts. DOT&PF will use FHWA's Traffic Noise Model most recently available version to develop noise contours. The predictions will be for worst case hour noise conditions. Generally, worst case hour are traffic levels at Level of Service (LOS) C or D, rather than heavy traffic volumes. In heavily congested urban areas, the peak traffic period (often LOS E or F) may not represent the worst noise conditions. For example, speeds may be low and heavy truck volumes may drop as truckers try to avoid severe congestion. Seasonal traffic variations should also be considered when determining the worse case hour noise condition. The Project Manager should consult with appropriate traffic and planning staff and review the annual traffic report in order to determine the appropriate volumes and speeds to use in the analysis. This input and any assumptions must be documented in the noise analyses report. DOT&PF will use a design hourly volume (DHV) that correlate with Level C or D rather than peak hour traffic. This will require coordination with Planning and Traffic to collect this information.

The input parameters for the TNM noise predictions should be documented in the noise analysis report. Input parameters should be approved by the DOT&PF Environmental Impact Analyst prior to modeling. All prediction results will be rounded off to the closest whole number (i.e., 67.5 dBA will be rounded up to 68 dBA, 67.4 dBA will be rounded down to 67dBA).

ANALYSIS OF TRAFFIC NOISE IMPACTS AND NOISE MEASUREMENTS

It is the DOT&PF Policy to utilize TNM noise predictions to model existing and future worst case noise levels. Actual measurements of existing noise levels are only utilized to validate TNM or other models acceptable to FHWA.

Noise Measurements

All noise measurements will be taken with an ANSI Type 1 or 2 integrating sound level meter and will be A-weighted.

For proposed highways on new alignments where no highway currently exists, noise measurements will be taken at representative receptor locations along the proposed route in order to determine the existing noise level.

In general, noise measurements will be taken during either the morning or evening peak traffic periods; or if LOS E or F exist, DOT&PF will use the traffic levels at Level of Service (LOS) C or other time period to replicate the model. Noise measurements may be taken outside the peak traffic periods for the sole intent of validating the TNM or other model acceptable to FHWA. Noise measurements will follow FHWA procedures for measuring traffic noise³. The locations, date, time, weather (sky cover, approximate temperature, wind speed and direction, precipitation and snow cover), a description of ground cover (hard or soft site), and traffic conditions (number of vehicles, percentage medium and heavy trucks, motorcycles) will be recorded on each measurement data sheet. Average traffic speeds can be estimated or measured and should also be noted on the data sheet. A map depicting the measurement site relative to the road and adjacent buildings must be provided (use actual measurements or locations using GPS, estimated locations are not acceptable). Sufficient information should be provided to allow re-creation of the measurements if necessary.

Two fifteen minute measurements will be taken at each receptor. Any noise sources other than highway sources should be noted on the dated sheet.

Model Validation

³ FHWA Final Report – *Measurement of Highway – Related Noise*, 1996 [FHWA-PD-96-046DOT-VNTSC-FHWA-96-5]

Noise measurements will be taken at representative locations throughout the proposed project corridor. Locations of the measurements must be approved by the DOT&PF Environmental Impact Analyst prior to being taken. Traffic counts will be taken simultaneously with noise measurements. The actual traffic counts, vehicle types, and speeds (estimated or measured) collected during the measurements will be utilized as input to TNM for the purpose of validation. Noise prediction results will be compared with actual measured results. Differences between the actual and predicted noise measurements within $\pm 3\text{dBA}$ will be considered acceptable. If the difference is greater than 3dBA , DOT&PF will coordinate with FHWA for direction. Either the model input will be reevaluated at those locations to ensure an accurate representation of site geometry and input, the noise measurements will be retaken, or shielding factors⁴ might be input into TNM to offset these differences. Once the model is determined to be valid the existing, Design Year Build (for all reasonable alternatives) and No-Build Noise Levels can be predicted.

Noise Predictions and Impact Assessment

DOT&PF gives primary consideration to exterior areas of frequent human use. Noise levels should typically be measured and/or predicted at exterior areas that receive frequent human use at the first row of structures (i.e., residences and/or businesses). These include patios or balconies of residential receivers. If access cannot be obtained to take measurements on private property, then a location close to the highway right of way line should be utilized. Measurements should not occur any closer than 10 feet from a building or fence, because the object can reflect noise. The location of receptors for noise predictions should be located at areas that receive frequent human use rather than at the right of way line. Preferably, the receptor locations will be at locations that will remain after construction of the proposed facility. Typically, a receptor location should not be selected if the location will not exist after construction of the proposed project because the basis for comparison would be lost. However, there may be some receptors that are relocated with one Build Alternative and remain with another, so it is not always possible to select receptor location that will exist after the construction of the preferred alternative.

For Type I projects, a traffic noise analysis is required for all build alternatives under detailed study in the NEPA process. All reasonable alternatives that have been carried forward for detailed analysis within the categorical exclusion documentation, environmental assessment or environmental impact statement and NOT rejected as unreasonable during the alternatives screening process will be analyzed for noise impacts. For Environmental Impact Statements or other studies that will examine broad corridors, the appropriate scope and methodology of the noise analysis should be

⁴ Shielding factors are to be used only as an absolute last attempt option. In just about every case reviewing the location to ensure accuracy will either correct the differences. If not, then shielding factor is used as an adjustment factor that is applied to the single receiver to bring it into the 3 dB(A) range.

discussed with FHWA and other participating agencies early in the project planning process.

For state-funded Type I projects a similar method of analysis will be followed. The preferred alternative carried forward in the State Environmental Checklist will be evaluated for noise impacts.

If any segment or component of an alternative meets the definition of a Type I project, then the entire alternative is considered to be Type I and is subject to these noise analysis requirements.

For Type I projects, the noise study area will be consistent with project limits, beginning of the project to the end of the project based on logical termini for that specific project (Beginning of Project to End of Project). The noise analysis must include analysis for each Activity Category present in the study area.

LAND USE CATEGORIES

Federal land use activity categories are defined by 23 CFR 772. DOT&PF has accepted the FHWA definition of these activity categories.

Activity Category A: Lands on which serenity and quiet are of extraordinary significance and serve an important public need. DOT&PF must submit justifications to FHWA on a case-by-case basis to designate any lands as Category A. Proposals and justifications for designating land as Activity Category A will be submitted from the Regional Environmental Manager through the state's FHWA Division Office and FHWA Headquarters.

Activity Category B: Residential - exterior areas of single-family and multi-family homes. Noise receptors should be located in areas that receive frequent human use (i.e., patios, balconies, playgrounds, gardens, etc.).

Activity Category C: Non-residential exterior areas of lands such as active sport areas, amphitheaters, 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, etc. Receptors should be located in areas that represent the area that receives the most frequent human use. Noise measurements and predictions will be taken at an outdoor location that is representative of the typical use for this area that receives the most frequent use. For structures, noise measurements and predictions will be taken at a location that is representative of the exterior area that receives the

most frequent use. Since the impact determinations are based on each area of frequent human use, then the number of areas impacted would be calculated and an equivalent number of residential units would be calculated to assess the feasibility and reasonableness of any abatement measures. Equivalent number of residential units will be calculated by determining the average residential lot size for the vicinity and then dividing this into the non-residential area for a total amount of residential units. For example: if a park has an area of 87,120 square feet, and the average residential lot size is 60 feet by 200 feet or 12,000 square feet then we would use 8 equivalent residential units to assess the feasibility and reasonableness of a proposed abatement measure.

Activity Category D: Includes interiors of 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. The impact determination will be based on the area of frequent human use; therefore the number of those areas that are impacted would be carried over to feasibility and reasonableness. For example: If a daycare center has 15 various areas of frequent human use (building and open space), but only 10 are impacted then 10 equivalent residential units would be used for the feasibility and reasonableness determination. An indoor analysis shall only be done after exhausting all reasonable outdoor analysis options. If there are no exterior areas that receive frequent human use then representative interior measurements may be appropriate if determined by DOT&PF. Permission will be obtained from property owner to take interior noise measurements at a designated receptor. Measurements will be taken with windows closed and open if possible. Traffic counts will be taken concurrent with the measurements.

Activity Category E: Exteriors of Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F or other developed lands that are less sensitive to highway noise. Noise measurements and predictions will be taken at a location that is representative of the exterior area that receives the most frequent use. The impact determination would be based on the total number of units within the complex, and/or the capacity limit of the facility. For example: If a hotel has 45 units and two meeting areas with a total capacity of 100 people each, then the number of receptors used for feasibility and reasonableness would be 200+ the 45 units.

Activity Category F: Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship-yards, utilities (water resources, water treatment, electrical), warehousing, and other land uses that are not sensitive to highway traffic noise. No highway noise analysis is required under 23 CFR 772 at Activity Category F land uses. For example, no noise analysis is required at locations that typically generate excessive levels of noise themselves or where the activities taking place on them are not considered noise

sensitive⁵) Proposals for designation of properties as Category F Activity Categories must be approved by the Environmental Impact Analyst assigned to the project.

Activity Category G: (Undeveloped lands that are not permitted) Land permitted for development (that is, a building permit has been issued on or before the date of public knowledge), that land shall be analyzed under the Activity Category for that type of development.

For land not permitted for development by the date of public knowledge (approval date of NEPA document or State Environmental Checklist), DOT&PF shall determine future noise levels pursuant to 23 CFR 772.17(a). The results shall be documented in the project environmental documentation and in the noise analysis report. The analysis should report the distance - measured from the proposed edge of the traveled way - to the Noise Abatement Criteria (NAC) for all exterior land use categories. Any noise abatement for such lands shall not be eligible for federal-aid participation.

DOT&PF DEFINITION OF “APPROACH THE NAC”

The DOT&PF defines “approach the NAC” as 1 dBA less than the NAC for Activity Categories A-E in Table 1 that is located in Appendix B of this policy.

A traffic noise impact may occur even if the future noise level is lower than the existing noise level. If the future noise level is 1 dBA less than or higher than the NAC for the activity category, then a noise impact exists.

DOT&PF DEFINITION OF “SUBSTANTIAL INCREASE OVER EXISTING NOISE LEVEL”

DOT&PF defines a “substantial increase over existing noise level” as 15 dBA over existing noise levels. A substantial increase is independent of the absolute noise level. A substantial increase over existing noise level is a noise impact, even if the future noise level does not approach or exceed the NAC.

The traffic noise analysis will identify all measurement sites with the predecessor capital letter M (i.e., M-1, M-2, M-3, etc.). All receptor sites where existing and future noise levels are being predicted and where noise measurements were not taken will be identified with the predecessor capital letter R (i.e., R-1, R-2, R-3, etc.). Receptors where noise impacts are predicted to exist will be identified by receptor identification number in the analyses report. Locations of the receptors will be identified on a map or

⁵ FAA does require noise analyses for certain types of airport projects, but this policy only applies to Highway Projects.

figure of appropriate scale and described in the text (physical location, address, GPS coordinates, etc.).

The following information will be identified in the noise analysis for each receptor:

- Receptor identification number
- Activity Category designation
- Specific noise abatement criteria for the receptor's activity category as modified by DOT&PF approach definition (i.e., For Activity Category B, the modified NAC would be 66dBA. For Activity Category E, it would be 71 dBA).
- Predicted existing noise level. It should be for the existing year of the analysis.
- Predicted future Design Year No-Build Noise Level
- Predicted future Design Year Build Noise Level for all reasonable alternatives
- Identification of whether a noise impact exists or will exist at this receptor in the future with and without the project.

ANALYSIS OF NOISE ABATEMENT MEASURES

A decision on whether to provide or not to provide a noise abatement measure must not be arbitrary or capricious. The basis for the decision must be documented and supportable, particularly if the decision is not to provide abatement and the affected residents want an abatement measure to be constructed. The decision must be based upon consistent and uniform application of this policy.

Noise abatement measures will be considered only when the existing or predicted future traffic noise levels approach or exceed the FHWA Noise Abatement Criteria (Table 1), or when the predicted future traffic noise levels (Design Year) of a build alternative results in a substantial increase over the existing traffic noise levels. DOT&PF considers a predicted noise level of 1 dBA below the FHWA Noise Abatement Criteria as the condition of "approach".

When traffic noise impacts are identified, then noise abatement shall be considered and evaluated for acoustic feasibility and reasonableness. On a federal Type I project, then the DOT&PF will construct it as a part of the project. For state Type I projects, if noise abatement is considered feasible and reasonable, then the Regional Environmental Manager will make a noise abatement recommendation to the Preconstruction Engineer. The Preconstruction Engineer will decide whether the recommended abatement measure will be constructed. Abatement will be provided on state funded projects only if the Preconstruction Engineer determines that the state funded appropriation can accommodate an expenditure on a noise abatement measure.

DOT&PF policy is that abatement for Activity Category A, B, C, D or E needs to be feasible and reasonable on their own merits. DOT&PF does not provide noise abatement measures for Activity Category F or G land uses unless it is necessary to

protect adjacent sensitive land uses (for example if there is an Activity Category F or G land use that is wedged into the project area that includes sensitive land uses, then by default it will be evaluated for abatement). Land uses not sensitive to highway traffic noise, and undeveloped lands will not be provided noise abatement.

Undeveloped land that is permitted for development (that is, a building permit has been issued on or before the date of public knowledge) will be analyzed under the Activity Category it has been permitted for. For example, if the undeveloped land is permitted to be developed for residential land use (Activity Category B), then it will be considered residential property in the analysis.

The following design principles from the *“Guide on Evaluation and Abatement of Traffic Noise, American Association of State Highway and Transportation Officials, 1993 and “FHWA Highway Noise Barrier Design Handbook”, Federal Highway Administration, December 2000* will be considered when determining whether to provide noise abatement at impacted receptors.

Noise barriers will be designed such that they do not pose a hazard to birds or other wildlife (i.e., clear panel barriers such as glass or plexiglass should not be used unless there is some means incorporated into the panel to prevent bird collisions).

FEASIBILITY AND REASONABLENESS ANALYSIS

The two required criteria to consider when evaluating the incorporation of noise abatement measures into a specific project are acoustic feasibility and reasonableness. A noise abatement measure will be determined acoustically feasible and reasonable as discussed below.

Acoustic Feasibility Criteria

Acoustic feasibility deals primarily with physics and engineering considerations (i.e., can a substantial noise reduction be achieved given the conditions of a specific location; is the ability to achieve noise reduction limited by factors such as topography, access requirements for driveways or ramps, the presence of cross streets, or other noise sources in the area).

1. Noise abatement measures are not feasible if a minimum of 5 dBA or more reduction cannot be achieved for at least 50 percent of the front row dwelling units. Noise abatement measures which do not achieve at least a 5 dBA reduction are not prudent expenditures of public funds as any less of a reduction is not easily detected by most people.

2. Noise abatement measures are not feasible if they create a safety hazard to the driving public, protected receptors or maintenance personnel. The Regional Environmental Manager will consult with the Design and Maintenance & Operations Sections when making this decision. The abatement measure should be consistent with the following general design principles:

- Noise abatement measures should be located beyond the recovery zone of the traveled way; if a noise abatement measure is within 30 feet of the traveled way, a traffic barrier may be warranted.
- Noise abatement measures should not block the recommended site distance (Alaska Highway Preconstruction Manual, Chapter 11) between vehicles and intersecting roadways or on/off-ramps.
- Protrusions on noise abatement measures near a traffic lane should be avoided.
- Facings on noise abatement measures that can become dislodged, or barrier components that could shatter during an accident, or facings that create excessive glare should be avoided.
- Access should be provided to all sides of noise abatement measures to allow for maintenance activities to take place.

All noise abatement measures should consider the design principles in the “*Guide on Evaluation and Abatement of Traffic Noise*”, AASHTO, 1993.

- a) Maintenance factors relating to replacement of materials damaged by impact, cleaning the noise barrier, and maintenance associated with adjoining landscape should be considered when determining feasibility.
- b) Barrier access points for emergencies or water sources needed during emergencies should be considered.
- c) Minimum setback distances and placement of noise abatement measures located at on/off-ramps and intersections should be based upon stopping sight distances, which depend on driver reaction time and deceleration rate.
- d) Placement of noise abatement measures should be a sufficient distance from the travel way to assure adequate space for storage of plowed snow and to assure that the abatement measure can withstand the additional loads that may result from blown snow being both thrown and piled up against the noise abatement measure.
- e) Noise abatement measure design should minimize shading highways in critical areas so that sunlight can melt ice or snow on the shoulders and travel lanes.

Reasonableness Criteria

Reasonableness is a more subjective criterion than feasibility. It implies that common sense and good judgment were applied in arriving at a decision. Reasonableness should be based on a number of factors, not just one criterion. FHWA noise regulations define three mandatory reasonableness factors that must be evaluated for a noise abatement measure to be considered reasonable. They are:

- A. Viewpoints of the property owners and residents of the benefitted receptors
- B. Cost Effectiveness
- C. Noise Reduction Design Goal

The DOT&PF considers these three mandatory reasonableness factors to determine reasonableness. The following optional reasonableness factors can only be used to increase the cost allowed only on state-funded projects:

- A. Date of development
- B. Length of time receivers have been exposed to highway traffic noise impacts
- C. Exposure to higher absolute traffic noise Levels
- D. Changes between existing and future build conditions
- E. Percentage of mixed zone development
- F. Use of noise compatible planning concepts by the local government

No single DOT&PF reasonableness factor shall be used to determine that a noise abatement measure is unreasonable.

1. Cost Effectiveness (federal mandatory criterion). The noise abatement measure cost is no more than \$32,000⁶ per receptor, based upon the design engineer's estimate. This is determined by counting all receptors (including owner-occupied, rental units, mobile homes, and businesses) benefitted by the noise abatement measure in any subdivision and/or given development, and dividing that number into the total cost of the noise abatement measure. A benefitted receptor is defined as the recipient of an abatement measure that receives a noise reduction at or above the minimum threshold of 5 dBA. Each unit in a multi-family building will be counted as a separate receptor. Cost per benefitted receptor must be reanalyzed at a regular interval not to exceed 5 years.

When the design engineer determines abatement measure cost, the estimate will include all items necessary for the construction of the noise abatement measure. Examples of cost items that should be included are traffic control, drainage modification, foundations, retaining walls and right-of-way. Include a cost item

⁶ This figure was updated during DOT&PF 2009 development of a noise guideline to reflect inflation numbers of previous policies as well as updated with more current information that was provided by region offices.

only if it is directly related to the construction of the noise abatement measure⁷. If a necessary a project feature, such as a retaining wall is included, then that cost will not be added into the noise abatement construction cost estimate. If the project incorporates visual mitigation such as the use of a transparent barrier with surface texture, the additional cost will not be included in the abatement construction cost estimate for the purpose of determining reasonableness. Aesthetic treatments, such as artwork, re-vegetation, landscaping and barrier treatments will not be included in the abatement measure cost estimate for the purpose of determining reasonableness.

The cost per benefited receptor must be adjusted for inflation. Use the most recent annual composite price index available from the FHWA Office of Program Administration www.fhwa.dot.gov/programadmin/pricetrends.cfm. The latest price index that FHWA developed is from 2006. This will be used until FHWA provides more current index. In the event that FHWA does not provide a more current index, DOT&PF will use the 2006 index and adjust it for inflation as necessary. This will be accomplished by determining the ratio between the 2006 annual composite index (221.3) and the most recent annual composite index available at the time of the completion of the Noise Abatement Recommendation Worksheet and adjust the \$32,000 cost accordingly. DOT&PF will also take into consideration the actual costs associated with project costs completed within the time since 2006 in determining a more accurate cost per benefited receptor.

2. Views of the property owners and residents (federal mandatory criterion) that benefit from noise abatement measures. To determine the desires of benefited households and property owners, DOT&PF will contact all benefited households and property owners to determine the level of interest for a noise abatement measure. This contact could be in the form of a mail out questionnaire, phone call survey, or door to door interviews whichever is most practical and cost effective for the size of the proposed project. At least 60 percent of households and property owners surveyed must want the noise abatement measure. The term "household" is used instead of residents because a single dwelling unit could have more or less inhabitants than another. The idea is not to give a dwelling unit with multiple inhabitants more consideration than one with fewer inhabitants. Also, property owners are also included as the dwelling units might be rentals. The property owner should have a say in whether noise abatement is provided to their property.

3. Noise reduction design goal (federal mandatory criterion). The DOT&PF noise reduction design goal is 7dBA. 50 percent or more of the benefitted receptors in the first row of structures must achieve this design goal for the noise abatement

⁷ DOT&PF will need to provide proof to the FHWA Division Office that the cost of any of these are solely and directly related to the noise abatement measure

to be considered reasonable. The DOT&PF goal is to provide more than the minimum 7 dBA reduction to a majority of the benefitted receptors in the first row of structures. This design goal is not extended to benefitted receptors beyond the first row of structures, as the further one gets from the noise barrier the more difficult it is to obtain a 7 dBA reduction.

The following criteria only apply to those state funded projects:

1. Development vs. Highway Timing (State funded only criterion). At least 50 percent of impacted receptors in the development (subdivision, apartment complex, etc.) were built before initial construction of the highway. The date of development is an important part of the determination of reasonableness. More consideration is given to developments that were built before the highway was built.
2. Development Existence (State funded only criterion). At least 50 percent of impacted receptors in the development have existed for at least 10 years. More consideration is given to residents who have experienced traffic noise impacts for long periods of time.
3. Absolute Predicted Build Noise Level (State funded only criterion). The predicted future build noise levels are at least 66 dBA. More consideration should be given to areas with higher absolute traffic noise levels. Absolute noise levels typically found along highways, 60-75 dBA, are deemed undesirable and cause complaints from adjacent residents. In general, the higher the absolute noise, the more complaints.
4. Relative Predicted Build Noise Level (State funded only criterion). The predicted future build noise levels are at least 10 dBA greater than the existing noise levels. More consideration is given to areas with larger increases over existing noise levels. This gives greater consideration to projects for highways on new location and major reconstruction than it does to projects of smaller magnitude. For most people, a 3 dBA increase is barely perceptible, a 5 dBA increase is readily perceptible, and a 10 dBA increase doubles the perceived loudness of the noise.
5. Build vs. No-Build Noise Levels (State funded only criterion). The future build noise levels are at least 5 dBA greater than the future no-build noise levels. More consideration should be given to areas where larger changes in traffic noise levels are expected to occur if the project is constructed than if it is not.

6. Land use (State funded only criterion). Land use is not changing rapidly and there are local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors.

Noise Abatement Recommendation Worksheet

A noise abatement recommendation worksheet (Appendix B) will be filled out for each noise receptor in the noise study. The Regional Environmental Manager will approve and sign the worksheets. If an abatement measure is determined not feasible, then the reasonableness analysis section of the Worksheet does not need to be completed. Likewise, if it determined that the abatement measure is not reasonable, the feasibility portion of the checklist will not have to be filled out. DOT&PF will only implement a noise abatement measure if it has been determined both feasible and reasonable. The Regional Environmental Manager will recommend or not recommend that a noise abatement measure be implemented. The recommendation worksheet will be submitted to the Project Manager (PM) who will sign the recommendation worksheet. If the PM does not approve the recommendation then the Preconstruction Engineer will resolve the dispute. The Preconstruction Engineer only needs to sign the noise abatement recommendation worksheet if quiet pavements are recommended as abatement on State-funded projects. The Regional Environmental Manager will ensure that the recommendation is included in the project's environmental document.

NOISE ANALYSIS REPORT

The results of the noise analysis will be presented in noise analysis report. The report will discuss the purpose of the study, the methods utilized, the results of the study, any proposed mitigation recommendations and a statement of likelihood. The noise analysis will be appended to the environmental document. The following general format will be followed for noise analysis reports.

Cover Page

Table of Contents

Summary

Project Background

Purpose of Study

Methods

Model

Validation Process

Description of Land Use Categories along the Corridor

Results

Identification of Noise Impacts

Noise Abatement Analysis

Abatement Recommendations

Statement of Likelihood

Construction Noise

Conclusion

Appendices

DOT&PF NOISE POLICY

Model- run inputs/outputs (optional)

During the detailed design of the proposed project, the recommendations for noise abatement made in the environmental document will be reevaluated to determine if they are still valid. If it is determined that any noise abatement measure recommendation is no longer valid, then the affected public will be notified and the environmental document reevaluated or supplemented as appropriate.

NOISE ABATEMENT MEASURE REPORTING PER 23 CFR772.13(f)

DOT&PF will maintain an inventory of all constructed noise abatement measures and report to FHWA per the requirements of 23 CFR 772.13(f). The inventory shall include the following parameters:

- 1) Type of abatement and cost (overall cost, unit cost per/sq. ft.);
- 2) Average height;
- 3) Length;
- 4) Area;
- 5) Location (state, city, route);
- 6) Year of construction;
- 7) Average insertion loss/noise reduction as reported by the model in the noise analysis; NAC category(s) protected;
- 8) Material(s) used (precast concrete, berm, lock, cast in place concrete, brick, metal, wood, fiberglass, combination, plastic (transparent, opaque, other); features (absorptive, reflective, surface texture); foundation (ground mounted, on structure); project type (Type I, other federal funding, state funding, local funding).

INFORMATION REQUIRED FOR NEPA DECISION

Prior to CE approval or issuance of a FONSI or ROD for a Type I project, the DOT&PF must identify,

- The noise abatement measures that are feasible and reasonable, and are likely to be incorporated into the project; Noise impacts for which no abatement appears to be feasible and reasonable; and
- The NEPA documentation shall identify the locations where noise impacts will occur, where noise abatement is feasible and reasonable, and the locations that have no feasible and reasonable abatement.

Statement of likelihood The statement of likelihood should identify the preliminary locations of feasible and reasonable abatement and a statement that the final noise abatement recommendation will be made after the final design and public involvement processes are complete. This statement of likelihood will be included in all NEPA documentation and noise analyses reports:

“As a result of the feasibility and reasonableness analysis conducted as a part of the environmental document, the DOT&PF proposes to incorporate the following noise abatement measures (type, locations) into the proposed project. These noise abatement recommendations are preliminary and based upon the feasibility and reasonableness analysis completed at the time the environmental document. Final recommendations for noise abatement will be based upon the feasibility and reasonable analysis conducted during the detailed design of the project. Any changes in the final abatement recommendations will result in the reevaluation of the approved NEPA document and the solicitation of additional public comment”.

THIRD PARTY FUNDING OF NOISE ABATEMENT

For federal projects, third party funding CANNOT be used to make up the difference in cost between the reasonable cost allowance and the actual cost. Third party funding can only be used to pay for additional features such as landscaping, aesthetic treatments, etc. for noise barriers that meet cost-effectiveness criteria.

FEDERAL PARTICIPATION FOR TYPE I FEDERAL PROJECTS

Federal Funds may be used for Noise Abatement measures when traffic noise impacts have been identified, and abatement measures have been determined to be feasible and reasonable pursuant to 23 CFR 772.13(d).

The following noise abatement measures may be considered for incorporation into a Type I project to reduce traffic noise impacts. The costs of such measures may be included in federal-aid participation project costs with the federal share being the same as that for the system on which the project is located.

- (1) Construction of noise barriers, including acquisition of property rights, either within or outside the highway right-of-way. Landscaping is not a viable noise abatement measure.
- (2) Traffic management measures including, but not limited to, traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations.
- (3) Alteration of horizontal and vertical alignments.

(4) Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise.

(5) Noise insulation of Activity Category D land use facilities listed in Table 1.

Post-installation maintenance and operational costs for noise insulation are not eligible for federal-aid funding.

Quieter pavement is currently not listed in federal regulations (23 CFR 772) as a noise abatement measure for which federal funding may be used. Consequently, quiet pavements cannot be used as noise abatement on federal-aid projects.

DOT&PF may consider quieter pavement to reduce traffic noise on a state-funded project. However, the decision to provide such a measure will be decided by the Preconstruction Engineer as described elsewhere in this policy.

INFORMATION FOR LOCAL OFFICIALS

In an effort to prevent future traffic noise impacts on currently undeveloped lands and to maintain compatibility between highways and future development, DOT&PF will inform local officials whose jurisdiction is within the highway project of the best estimation of future noise levels for both developed and undeveloped properties in the immediate vicinity of the project. In addition, information on federal-aid, non-eligibility of noise abatement for lands permitted for development after the date of public knowledge will also be provided to local officials. This usually will be accomplished by providing a copy of either the project's noise analysis or the approved environmental document to the local government. This information may also be provided through the plat review process.

CONSTRUCTION NOISE

For all Type I Federal and State Projects, it is the policy of DOT&PF to:

- (a) Identify land uses or activities that may be affected by noise from construction of the project. The identification is to be performed during the project development studies.
- (b) Determine the measures that are needed in the plans and specifications to minimize or eliminate adverse construction noise impacts to the community. This determination shall include a weighing of the benefits achieved and the overall adverse social, economic, and environmental effects and costs of the abatement measures.
- (c) Incorporate the needed abatement measures in the plans and specifications.

The Regional Environmental Manager will work with the Design Engineering Manager to reduce construction noise by requiring the contract specifications include the statement that all construction equipment be properly maintained and have mufflers in acceptable working condition. In the event that construction noise complaints occur during the

course of construction activities, measures will be taken by the Construction Project Engineer to resolve the problem to the extent practical. Measures might include locating stationary construction equipment as far from nearby noise sensitive receivers as possible, shutting off idling equipment, rescheduling construction operations to avoid periods of noise annoyance, notifying nearby residents whenever extremely noisy operations will be occurring, and installing permanent or portable acoustic abatement measures around stationary construction noise sources.

In some cases there are no alternatives to conducting construction activities during the night, on weekends, or on holidays. When deemed necessary, the Department will make every effort to notify the public prior to conducting these activities. The public involvement in these cases should occur during design and throughout the construction duration. In some communities, local ordinances may restrict noise generating activities. Where this is the case, the Department and its contractor will comply with local noise ordinances and acquire any necessary noise permits for these activities prior to their initiation.

STATE-FUNDED PROJECTS

In general, the same methods are followed in the identification of noise impacts for state-funded projects and federal-aid projects. Results of noise analyses will be documented in the State Projects Environmental Checklist. If noise abatement is determined to be feasible and reasonable, then the Regional Environmental Manager will make a recommendation to the Preconstruction Engineer. The Preconstruction Engineer will decide whether the recommended abatement measure will be constructed. Abatement will be provided only if it meets the feasibility and reasonableness criteria of this policy and the state funded appropriation can accommodate this expenditure.

SUPERCEDEENCE

This policy is effective upon signature and replaces the Department's March 1996 Noise Policy and the April 2009 Traffic Noise Abatement Guidance. This policy is applicable to any project that does not have an approved NEPA document prior to its implementation.

WEBLINKS as of November 2010.

<http://www.fhwa.dot.gov/environment/noise/>

FHWA *Highway Traffic Noise: Analysis and Abatement Guidance* June 2010 is available at the following website

http://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/guidancedoc.pdf

Noise Model Web site at the following URL <http://www.fhwa.dot.gov/environment/noise/index.htm>.

APPENDIX A
FHWA 23 CFR 772,

APPENDIX B

NOISE ABATEMENT CRITERIA TABLE

FHWA NOISE ABATEMENT CRITERIA from 23 CFR 772 Table 1

Hourly A – Weighted Sound levels decibels (dBA)⁸

<u>Activity Category</u>	<u>Activity Leq(h)</u>	<u>Criteria⁹ L10</u>	<u>Evaluation Location</u>	<u>Description of Activity Category</u>
A	57	60	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 ¹⁰	67	70	Exterior	Residential.
C ³	67	70	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	55	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	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.
F	None	None	None	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	None	None	None	Undeveloped lands that are not permitted.

⁸ Either Leq(h) or L10(h) (but not both) may be used on a project

⁹ The Leq(h) or L10(h) Activity Criteria

¹⁰ Includes undeveloped lands permitted for this activity category.

APPENDIX C

Feasibility and Reasonableness Worksheet Example HIGHWAY TRAFFIC NOISE ABATEMENT FOR PROJECT:

Receiver ID No.(s):

Location/Description:

Activity Category type:

Noise Abatement Criteria for this Activity Category(Leq) (Table 1 DOT&PF Noise Policy):

Existing Noise Level (Leq):

Future Build Noise Level (Leq):

Future No-Build Noise Level:

Has a noise impact been identified (If yes continue filling out worksheet. If no, no noise abatement is required. Sign worksheet and recommend no noise abatement)?: Yes No

Highway Traffic Noise Abatement Feasibility and Reasonableness Analysis:

Feasibility

Is the proposed noise abatement measure acoustically feasible?	Yes	No
Is the proposed noise abatement measure engineering feasible?	Yes	No

Reasonableness

Is the proposed noise abatement measure considered reasonable?	Yes	No
--	-----	----

Federal Mandatory Factors

- 1 **Cost Effectiveness.** Is the abatement measure cost effective?
- 2 **Views of Benefited Residents and Property Owners.** Do at least 60 percent of the impacted residents and property owners surveyed desire noise abatement?
- 3 **Noise reduction design goal?** Does the noise abatement measure provide 7 dBA reduction to 50 percent or more of the benefitted receptors in the first row of structures?

DOT&PF Mandatory Factors (State funded only)

4. **Development vs. Highway Timing.** Were at least 50 percent of benefitted receptors in the development built before highway construction?
- 5 **Development Existence.** Have at least 50 percent of benefitted receptors in the development existed for at least 10 years?
- 6 **Absolute Predicted Build Noise Level.** Are the predicted future build noise levels at least 66dBA?
- 7 **Relative Predicted Build Noise Level.** Are the predicted future build noise levels at least 10 dBA greater than the existing noise levels?
- 8..**Build vs. No-Build Noise Levels.** Are the future build noise levels at least 5 dBA greater

than the future No-Build noise levels?

9..Land Use. Is the land use changing rapidly and are there local ordinances or zoning in place to control the new development of noise sensitive land uses adjacent to transportation corridors?

Is Noise Abatement recommended for this impacted receptor(s)?

What type of noise abatement is recommended? (Note – The use of quiet pavements is not an approved noise abatement measure on Federal- Aid Projects. Quiet pavements can be utilized as an abatement measure on State-funded projects with the approval of the Regional Preconstruction Engineer)

What is the basis for this recommendation?

Regional Environmental Manager

Date

DOT&PF Project Manager

Date

I have determined that the use of quiet pavement to mitigate noise impacts on a state-funded project is within the cost constraints of the legislative appropriation for the proposed project.

Preconstruction Engineer ¹¹

Date

¹¹ The Preconstruction Engineer’s signature is only required if quiet pavements are recommended on State-funded projects. The Preconstruction Engineer must determine whether the incorporation of quiet pavements into the State-funded project is within the cost constraints of the legislative appropriation