APPENDIX C

Noise Baseline

TRAFFIC NOISE IMPACT ANALYSIS

US 60 Improvements
Ballard and McCracken Counties, Kentucky
Item Numbers: 01-115.00, 01-115.1 and 01-118.00

Prepared for:

Kentucky Transportation Cabinet
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TABLE OF CONTENTS

TABLES

FIGURES

APPENDICES

EXECUTIVE SUMMARY

The proposed project consists of the reconstruction of approximately 6.7 miles of US 60 in McCracken and Ballard Counties. The project begins in Ballard County on US 60, east of the community of La Center at approximately milepoint (MP) 12.0, just east of Humphrey Creek and west of KY 310. The project ends in McCracken County where the existing US 60 four-lane cross-section into Paducah ends, at MP 1.5.

The purpose of the project is to improve mobility and safety for the US 60 corridor in eastern Ballard County. The project would increase the opportunity for freight movement and improve safety by modifying and/or improving geometrics to meet current design standards.

A traffic noise impact analysis (TNIA) was performed to determine the highway-generated noise impacts associated with the proposed project. The analysis was conducted in accordance with governing document 23 Code of Federal Regulations (CFR) Part 772, "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*" and the Kentucky Transportation Cabinet *Noise Analysis and Abatement Policy* (dated July 1, 2015).

Based on TNM modeling, traffic data for the design year (2040) and the most current design files for the US 60 improvements, traffic noise impacts are predicted to occur as a result of the construction of any of the 3 build alternatives. The construction of noise barriers was considered for abating noise impacts generated by the proposed project.

Upon review, Alternative 1 represents an improvement primarily on new alignment. As described by the existing land use, noise sensitive receptors are relatively few and are dispersed and scattered throughout the study corridor. After consideration of potential relocations or displacements by the proposed Alternative 1 alignment, these receptors represent isolated residences in vicinity to the proposed alignment. Substantial noise reduction for a reasonable number of impacted receptors would not be achievable. Construction of noise walls was therefore not considered feasible for Alternative 1.

For Alternative 2, which generally follows the existing US 60 alignment, approximately 23 receptors were determined to have future noise levels that would approach or exceed their NAC. However, 16 receptors would potentially be displaced or relocated by the widening improvements with at least 3 receptors representing isolated residences. Four (4) of the remaining receptors

were located adjacent to US 60 in Kevil and currently have direct access (driveways). A proposed barrier at this location would pose safety, overriding sight distance and visibility issues for motorists. Potential noise barriers were not considered acoustically feasible for this alternative and none were proposed.

Approximately 11 receptors were determined to have future noise levels that would approach or exceed their NAC for Alternative 3. The alignment for Alternative 3 follows the former railroad bed west of Kevil and follows existing US 60 through the eastern portion of the project area. At least seven (7) receptors would potentially be displaced or relocated by the widening improvements. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). As discussed for Alternative 2, a proposed barrier at this location would pose overriding sight distance and visibility issues for motorists. For the section of Alternative 3 on new alignment, predicted noise levels for four (4) receptors would also substantially exceed (> 10 dBA Leq) their existing noise levels. However, all of these receptors would be considered isolated residences. Since a substantial noise reduction would not be achievable for a reasonable number of impacted receptors, noise barriers were not considered acoustically feasible for this alternative and none were proposed.

The opportunities for minimizing traffic noise as a result of the project are limited. Based on a preliminary noise analysis, the construction of noise barriers are not acoustically feasible and therefore, not reasonable for any alternative. Alignment shifts would also likely result in increased environmental impacts, relocations and construction costs. Therefore, additional noise abatement measures were determined not to be effective as described in 23 CFR 772.13(c) and none were proposed.

1.0 INTRODUCTION

The proposed project is the reconstruction of 6.7 miles of US 60 in McCracken and Ballard Counties. The project begins in the west in Ballard County on US 60, east of the community of La Center at approximately milepoint (MP) 12.0, just east of Humphrey Creek and west of KY 310. The project ends in the east in McCracken County where the existing US 60 four-lane cross-section into Paducah ends, at MP 1.5. The project study area is shown in **Figure 1, Study Area.**

The following sections provide an overview of the purpose of the Traffic Noise Impact Analysis (TNIA) conducted for the US 60 Improvements in Ballard and McCracken counties and also includes a brief statement of the project's purpose and need as well as provide background information for the project.

1.1 Purpose of the Traffic Noise Impact Analysis

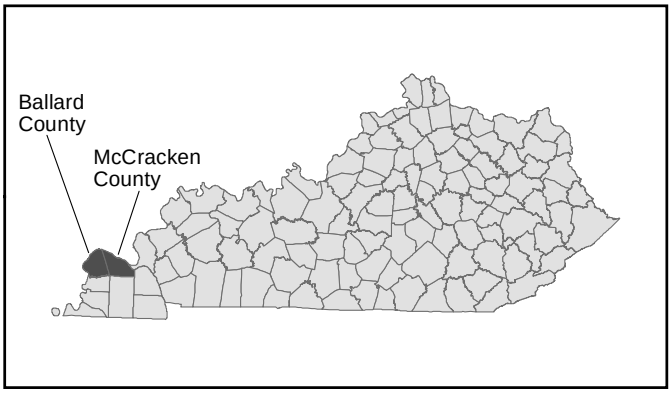
The purpose of this report is to evaluate traffic noise impacts and examine potential noise abatement options, if required, under the requirements of Title 23, Part 772 of the Code of Federal Regulations (CFR), "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*" and the Kentucky Transportation Cabinet's (KYTC) *Noise Analysis and Abatement Policy* (dated July 1, 2015).

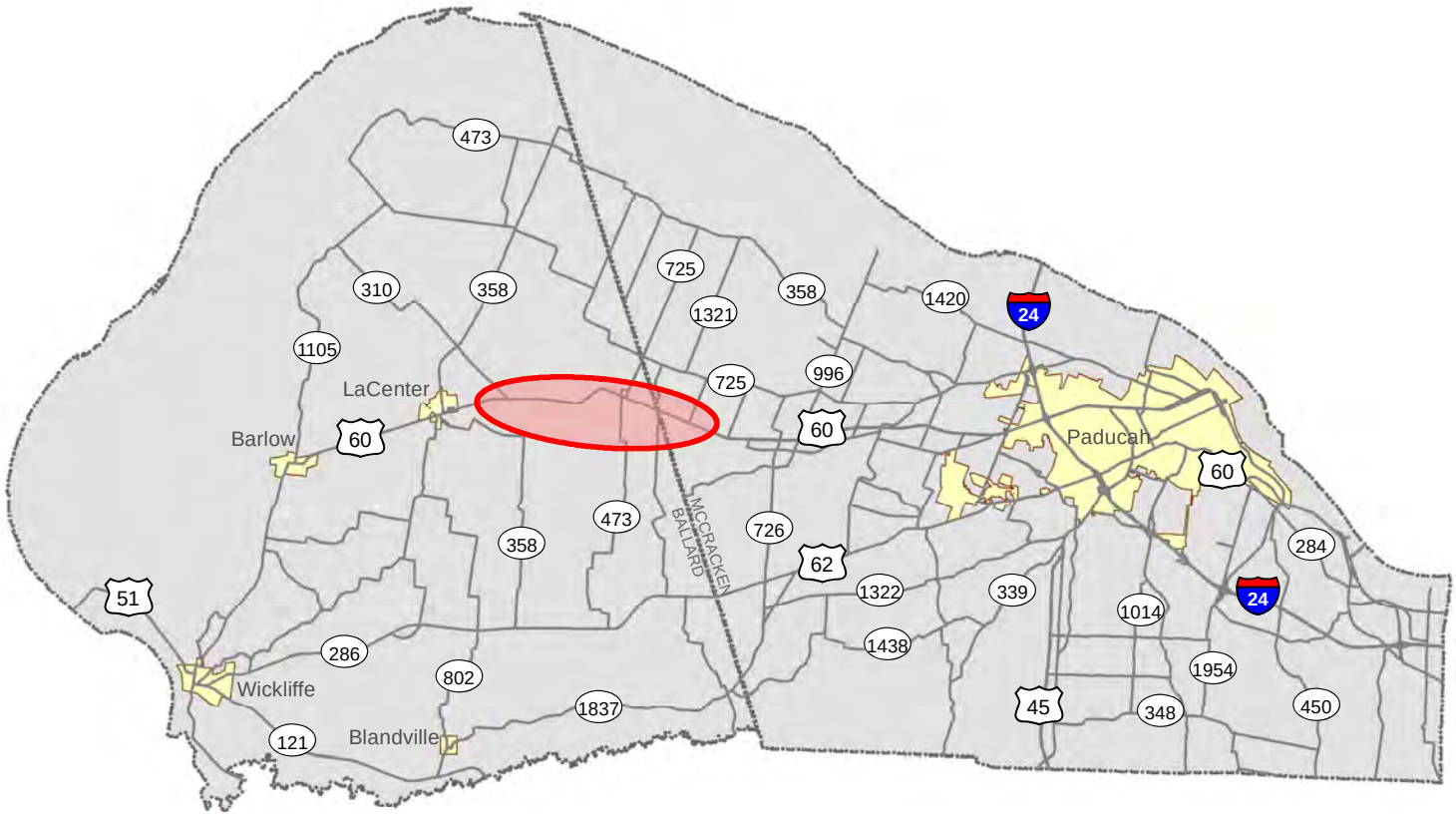
1.2 Project Purpose and Need

The purpose of the project is to improve mobility and safety for the US 60 corridor in eastern Ballard County. US 60 is the only east-west arterial link in Kentucky west of Paducah, leading to the only Ohio River highway crossing for an 80-mile stretch. Listed on the National Highway System and a state-designated truck route, its narrow lanes, limited passing opportunities, closely spaced access points through Kevil, and substandard curves make the route challenging for freight carriers. Further, five years of data show a history of crashes, with two high crash spots and five fatality collisions.

1.3 Project Area Description and Setting

The area is generally rural and agricultural in nature; however, there is commercial and residential development along US 60 through the city limits of Kevil. This development is relatively dense as compared to the surrounding project area, and many of the structures are located close to the existing road. Numerous driveways and commercial entrances are located along this stretch. The





Project Location

0 2.5 5 Miles

Figure 1

Study Area

US 60

Ballard and McCracken Counties

KYTC Item No. 01-115.00, 01-115.10, 01-118.00

commercial developments along this segment of US 60 are generally banks, auto repair shops, small specialty shops, and other small businesses. A technology park, which includes several businesses, an adult care facility, and children's daycare center, is also located in this area.

1.4 Existing Facilities

US 60, locally known as Hinkleville Road, Kentucky Avenue, and Paducah Road moving east to west, is a two-lane rural highway with two 11-foot lanes and 2-foot paved shoulders. The speed limit in the area is generally 55 miles per hour (mph) except through the city of Kevil. In Kevil, the speed limit is 35 mph west of KY 473 and 45 mph east of KY 473. The existing roadway has several segments that do not meet current geometric standards, and sight distance is severely restricted at several locations. No traffic stoplights exist on this section of roadway, but a flashing beacon is located at the intersection of US 60 and KY 473.

US 60 is the only east-west arterial link in Kentucky west of Paducah, leading to the only Ohio River highway crossing for an 80-mile stretch. Listed on the National Highway System and a state-designated truck route, its narrow lanes, limited passing opportunities, closely spaced access points through Kevil, and substandard curves make the route challenging for freight carriers. The route is rated for AAA trucks (up to 80,000 pounds gross weight). Volumes range from 5,800 to

7,200 vehicles per day (vpd) based on 2017 counts, including 12 percent truck traffic. There are three culverts along the route, all rated in Fair condition as of their 2017 inspections:

- 004B00011N for Frazier Creek, MP 12.475
- 004B00012N for Branch of Frazier Creek, MP 12.515
- 004B00013N, for Page Branch, MP 15.866

Other **state-maintained highways** in the area are KY 310 (Turner Landing Road) near the western project terminus, KY 473 (Gage and New Liberty Church roads) in Kevil, and KY 2532 (County Line Road) – all rural minor collector routes. A few dozen local routes also intersect US 60 along the project length.

2.0 ALTERNATIVES UNDER CONSIDERATION

The proposed project is the reconstruction of 6.7 miles of US 60 in McCracken and Ballard counties. The project begins in the west in Ballard County on US 60, east of the community of La Center at approximately milepoint (MP) 12.0, just east of Humphrey Creek and west of KY 310. The project ends in McCracken County where the existing US 60 four-lane cross-section into Paducah ends, at MP 1.5 (**see Figure 2, Project Location)**. Preliminary designs have been developed under three separate KYTC Item numbers, including a southern "preferred alternative" on new alignment.

Local officials have voiced their preference for a four-lane section; however, due to the Transportation Cabinet's focus on Performance Based Flexible Solutions (PBFS), lack of funding, and traffic volumes in the area, it is important to consider a two-lane initial/four-lane ultimate typical section as well. Therefore, alternates that include both a two-lane initial/four-lane ultimate and a four-lane typical section were considered. Traffic projections will be used to further define the alternates and typical sections studied.

The environmental process will evaluate a No-Build Alternative and three build alternatives:

- Rebuild the existing road, either in total or in selected locations; and
- Build a road on new alignment within the same general roadway corridor

2.1 No-Build Alternative

In order to satisfy National Environmental Policy Act (NEPA) requirements, an evaluation of the No-Build Alternative was performed. The No-Build Alternative is one in which the KYTC would take no action to construct or reconstruct US 60; only routine maintenance would occur. The No-Build Alternative would maintain the current configuration of the existing roadway. The No-Build Alternative would not improve east-west connectivity and would not meet the stated purpose and need for the proposed project. Therefore, the No-Build Alternative was not considered a reasonable and feasible alternative.

2.2 Build Alternatives

Three build alternatives are under consideration as shown in **Figure 2.** A variety of typical sections were considered as part of the engineering design process: two to five travel lanes, various

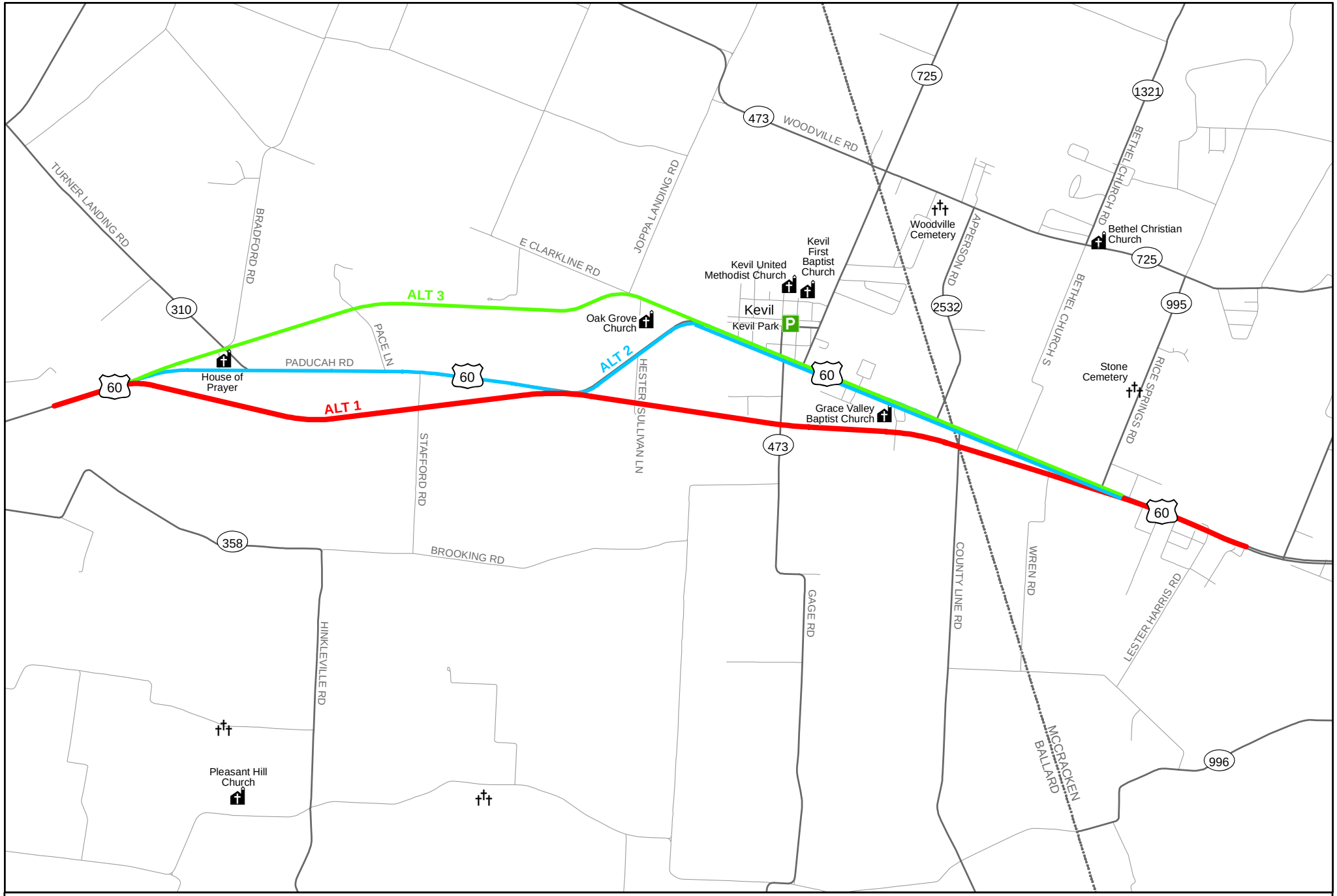


Figure 2

Project Location

US 60

Ballard and McCracken Counties

KYTC Item No. 01-115.00, 01-115.10, 01-118.00

shoulder widths, rural or urban templates, etc. To be conservative, the largest footprint scenarios were evaluated and impacts may be reduced as preliminary designs are refined.

- **Alternative 1** (Red) begins east of the bridge over Humphrey Creek, creating a new route on new alignment south of existing US 60. It ends at the improved 4-lane section near Lester Harris Road. The assumed cross-section is a 4-lane divided rural highway.
- **Alternative 2** (Green) begins east of the bridge over Humphrey Creek, generally following the existing US 60 alignment. The assumed cross-section is a 4-lane divided rural highway with a 5-lane urban section through Kevil.
- **Alternative 3** (Blue) begins east of the bridge over Humphrey Creek, while creating a new route along the old railroad bed west of Kevil. The alignment then generally follows the existing US 60 alignment through Kevil to the east. The assumed cross-section is a 4-lane divided rural highway with a 5-lane urban section through Kevil.

3.0 TRAFFIC NOISE ANALYSIS

Noise can be generally defined as unwanted or excessive sound. Sources of highway traffic noise include tire pavement interaction, as well as vehicle engine and exhaust system operations. Noise is a vibrational energy form that causes pressure variations in elastic media such as air or water. The human ear perceives these variations as sound. The ear can discern different levels of loudness as the intensity of pressure variations fluctuate. These pressure differences are commonly measured in decibels (dB). The decibel scale audible to the human ear ranges from 0 to 140 dBs. A level of zero decibels corresponds to the lowest limit of audibility, while a level of 140 decibels represents the threshold of pain. To closely resemble the non-linear sensitivity of human hearing, the "A-weighted" scale is used to define the relative loudness of different frequencies. Sound levels measured using the A-weighted scale is often expressed as dBA.

The procedures set forth by the Federal Highway Administration (FHWA) recommend noise analyses to be performed in terms of either L10 or Leq. L10 is the sound level exceeded 10 percent of the time. Leq is defined as the equivalent, steady state sound level, which in a given period of time contains the same acoustical energy as the time-varying sound level during the same time period. The Leq noise descriptor was used in this study because of its relative ease to monitor and compare with FHWA's Noise Abatement Criteria (NAC). For the purposes of this study, all references to sound levels will be in dBA Leq.

For this project, the latest version of the FHWA Traffic Noise Model (TNM) Version 2.5 was used to predict the highway generated traffic noise levels associated with the US 60 improvements. TNM takes into account factors from current and future traffic volumes and speeds, vehicle types, meteorology, topography, buildings and roadways. These factors are used to create a 3-dimensional model that is used to calculate noise levels for an entire area and can also be used to predict both existing and future noise levels for specific locations using various criteria and information programmed into the model.

3.1 Noise Sensitive Sites

The FHWA's Noise Abatement Criteria (NAC) was used to select noise sensitive land uses within the project study area **(see Table 1**). Seven land use activity categories have been identified by FHWA for use in traffic noise impact analysis. Maximum noise level thresholds have been established for four of these land use activity categories. These maximum thresholds or criteria

Table 1: Noise Abatement Criteria (NAC)

Activity	Hourly A-Weighted Sound Level: Decibels (dBA)		Description of Activity Category
	$L_{eq}(h)$	$L_{10}(h)$	
A	57 (Exterior)	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	67 (Exterior)	70 (Exterior)	Residential
C	67 (Exterior)	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 (Interior)	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 (Exterior)	75 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	--	--	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	--	--	Undeveloped lands that are not permitted.

levels represent acceptable traffic noise conditions. Noise abatement measures must be considered when predicted noise levels approach (i.e. within 1 dBA the respective NAC) or exceed the NAC or when a substantial noise increase occurs. A substantial noise increase occurs when there is an increase in noise levels of 10 dBA or more for the design year over existing levels as a direct result of the transportation improvement.

A field review of the project corridor and a review of available aerial mapping were conducted to identify the noise sensitive receptor sites that may be impacted by traffic noise associated with the proposed improvements. Typical noise sensitive receptors include residences, parks, schools, hospitals, and churches. Noise sensitive sites represent any property (owner occupied, rented, or leased) where frequent exterior human use occurs and where a lowered noise level would be of benefit.

3.2 Field Measurements of Existing Noise Levels

Based on the results of the field review and a review of available mapping, five (5) locations were selected as representative noise sensitive sites within the US 60 study area **(see Figure 3, Build Alternatives)**. The sites that were selected for existing noise measurements are described briefly in **Table 2, Identification and Description of Receptor Site Locations**.

Ambient noise measurements were taken using a Larson Davis 831 (type 1) sound level meter on October 22nd and 23rd, 2018. The meter was calibrated to be in tolerance of the manufacturer's specification on June 7, 2018. The procedures used to measure existing noise levels were conducted in accordance with the methodology established by the Federal Highway Administration (FHWA) and documented in *Report No. DP-96-046, Measurement of Highway-Related Noise: Final Report, May 1996.*

In order to represent the Leq(h), noise measurements were performed in 15 minute intervals and were taken 5 feet above the ground. The measurements were conducted during peak and non-peak hours of free-flow traffic conditions and measurements were taken under meteorologically acceptable conditions. Prior to measurements, the sound level meter was calibrated using an acoustical calibrator. Dates, times, traffic data and measured noise levels for each of the monitoring sites are shown in **Table 3, Existing Noise Levels (dBA Leq)**. Monitoring locations are described in more detail in **Appendix A.**

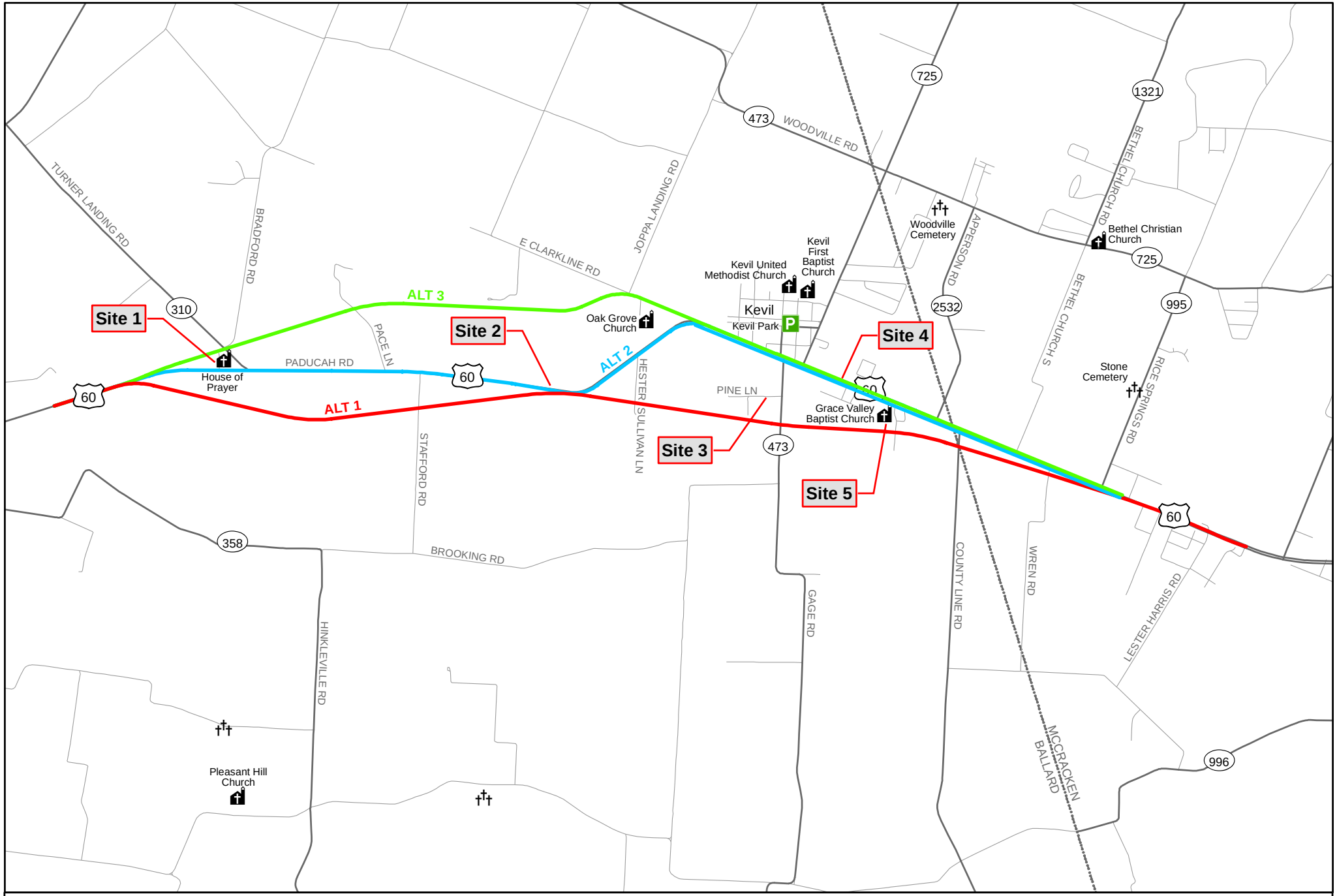


Figure 3

Build Alternatives

US 60

Ballard and McCracken Counties

KYTC Item No. 01-115.00, 01-115.10, 01-118.00

Table 2: Identification and Description of Receptor Site Locations

Noise Reading Site Location and Activity Category	NAC	Description	Total Receptors[1]
1 B/C – Church	67	This site represents the House of Prayer located on US 60 (Paducah Road) at the west end of the project near the intersection of US 310. The site also represents the exterior area of the church (picnic tables).	1 church/4 residences
2 B – Residential	67	This site represents a single-family residence located at 7948 US 60 (Paducah Road). This site also represents approximately 5-6 other residences along US 60.	7
3 B – Residential	67	This site represents a single-family residence just north of Pine Lane and where the proposed build alternative alignment would cross KY 473 (Gage Road). This site also represents approximately 3 other residences.	4
4 B - Residential	67	This site represents a single-family residence on US 60 (Paducah Road) adjacent to the West Kentucky Technology Park. This site also represents approximately 9 other residences along US 60.	10
5 B/C – Church	67	This site represents the Grace Valley Independent Baptist Church located on US 60 (Kentucky Avenue) at the east end of the project near the intersection of Amy Lynn Road.	1 church/5 residences

Traffic data was simultaneously recorded during the 15-minute noise measurements and was classified into five (5) vehicle types, automobiles, medium trucks, heavy trucks, buses and motorcycles, for subsequent entry into the TNM noise prediction computer model. Vehicle speed observations while driving the existing roads and posted speed limits along the roads were used to obtain average travel speeds for each vehicle type. Since all noise levels for this report are based on a one-hour period, the field recorded traffic volumes were adjusted upward to reflect hourly volumes. The traffic data along with the existing and proposed road geometry were used as input to the TNM model to predict noise levels at each of the sites.

1 *Total number of receptors represented by the study site, including the study site receptor.*

Table 3
US 60 Improvements
Existing Noise Levels (dBA Leq)

Site Number	Receptor	Date	Time Period	Event No.	Direction (NB/SB or EB/WB)	Hourly Traffic Based on Concurrent Traffic Counts										Measured Leq
						Autos	MT	HT	Bus	MC	Autos	MT	HT	Bus	MC	
			AM Peak													
1	**House of Prayer**	10/23/2018	9:11 - 9:26 am	LxT_015	EB/WB	144	12	20	0	0	100	20	52	0	0	**64.6**
		10/23/2018	9:26 - 9:42 am	LxT_016	EB/WB	168	8	56	0	4	56	12	16	0	0	**64.9**
			midday													
		10/23/2018	1:21 - 1:36 pm	LxT_023	EB/WB	108	20	24	0	0	120	20	40	4	0	**64.0**
		10/23/2018	1:36 - 1:51 pm	LxT_024	EB/WB	112	16	16	0	0	124	4	20	0	0	**64.3**
			PM Peak													
		10/22/2018	3:00 - 3:15 pm	LxT_001	EB/WB	268	28	48	0	12	192	24	40	0	0	**69.0**
		10/22/2018	3:15 - 3:30 pm	LxT_002	EB/WB	248	16	32	0	4	216	4	8	0	0	**64.6**
			AM Peak													
2	**7948 US 60 residence**	10/23/2018	8:48 - 9:03 am	LxT_014	EB/WB	128	12	12	4	0	60	0	56	0	0	**65.8**
			midday													
		10/23/2018	12:58 - 1:13 pm	LxT_022	EB/WB	72	12	12	0	4	72	12	16	4	0	**61.2**
			PM Peak													
		10/22/2018	3:48 - 4:03 pm	LxT_003	EB/WB	152	28	12	0	0	232	8	28	0	0	**64.1**
			AM Peak													
3	**Pine Lane residences**	10/23/2018	8:19 - 8:35 am	LxT_013	NB/SB	-	-	-	-	-	-	-	-	-	-	**46.4**
			midday													
		10/23/2018	12:35 - 12:50 pm	LxT_021	NB/SB	-	-	-	-	-	-	-	-	-	-	**45.6**
			PM Peak													
		10/22/2018	4:14 - 4:29 pm	LxT_004	NB/SB	-	-	-	-	-	-	-	-	-	-	**52.3**
			AM Peak													
4	**West Kentucky Technology Park residences**	10/23/2018	7:41 - 7:57 am	LxT_011	EB/WB	360	8	20	4	0	148	16	20	4	0	**61.5**
		10/23/2018	7:57 - 8:12 am	LxT_012	EB/WB	292	16	4	0	0	168	0	32	0	0	**61.8**
			Midday													
		10/23/2018	11:54 - 12:09 pm	LxT_019	EB/WB	192	8	24	0	8	184	24	20	0	0	**60.0**
		10/23/2018	12:09 - 12:24 pm	LxT_020	EB/WB	180	8	24	0	0	180	20	28	0	0	**62.8**
			PM Peak													
		10/22/2018	4:39 - 4:54 pm	LxT_005	EB/WB	252	12	20	0	0	380	36	36	4	0	**62.4**
		10/22/2018	4:54 - 5:10 pm	LxT_006	EB/WB	216	8	8	0	0	416	8	12	0	0	**60.1**
			AM Peak													
5	**Grace Valley Independent Baptist Church**	10/23/2018	7:05 - 7:20 am	LxT_009	EB/WB	312	8	12	0	0	208	16	20	0	0	**63.5**
		10/23/2018	7:20 - 7:35 am	LxT_010	EB/WB	416	8	12	0	0	272	4	16	4	0	**63.5**
			Midday													
		10/23/2018	11:15 - 11:31 am	LxT_017	EB/WB	192	8	12	0	0	148	8	24	0	0	**61.1**
		10/23/2018	11:31 - 11:48 am	LxT_018	EB/WB	156	20	20	0	0	200	12	20	0	0	**60.9**
			PM Peak													
		10/22/2018	5:19 - 5:34 pm	LxT_007	EB/WB	176	16	24	0	0	384	12	16	0	8	**62.8**
		10/22/2018	5:34 - 5:49 pm	LxT_008	EB/WB	172	4	16	4	0	268	12	24	0	0	**62.7**

Climatological data (average wind speed, relative humidity, and temperature) were measured in the field using a Nielsen-Kellerman Kestrel® 3000 Pocket Weather Meter. Weather readings were taken at the time the noise measurements were taken. The Kestrel 3000 uses a hermetically sealed thermistor accurate to ±1°C to measure temperature, a silicon-based capacitive sensor accurate to ±3% to measure humidity, and a 25 mm-diameter impeller on sapphire bearings to provide wind speeds from 0.7 to 89 mph with an accuracy of ±3%.

As shown in **Table 3**, measured noise levels in the project area range from 45.6 dBA Leq for Site 3 located north of Pine Lane where the proposed build alternative alignment crosses SR 473 (Gage Road) to a PM reading of 69.0 dBA Leq at Site 1 (House of Prayer) near the western terminus of the project. This reading was considered to be unusually high compared to other readings recorded at this location. Site 1 represents both the church's exterior area (Activity Category C) and approximately 4 nearby residential land uses. There are picnic tables and a playground area at the church, which represent areas of exterior use. The PM reading does exceed the 67 dBA Leq NAC but for the remaining sites, existing noise levels do not approach or exceed the respective NAC criteria.

3.3 TNM Model Validation

Existing noise levels were measured directly by a sound level meter to establish ambient noise levels at those representative locations along existing roadways where traffic noise was considered the predominant noise source. Existing noise levels were also measured by a sound level meter to validate the noise prediction model. In accordance with 23 CFR 772.11(d)(2), FHWA requires validating predicted values with actual measured levels to verify the accuracy of the noise model to predict existing or future noise levels.

The noise model is validated on a site-specific basis by comparing existing noise levels with the model predictions based upon traffic counts obtained during noise measurement periods. Additional adjustments are applied to the model as part of the validation process to account for speed, site distance from the roadway, grade, length of roadway segment, and shielding. The differences obtained are used to determine site peculiarities for existing and predicted noise levels for which the model might not account for. TNM estimates vehicle noise emissions based on reference energy mean emission levels for five classes of vehicles: motorcycles, automobiles and

light trucks, buses, medium trucks (with two axles and six wheels), and heavy trucks (with three or more axles).

The model is considered validated when modeled noise levels using TNM are within +/- 3.0 dBA Leq for all measured sites. Model validation was performed for Sites 1, 2, 4 and 5 where existing traffic was observed and considered to be the predominant noise source. As shown in **Table 4**, the measured noise levels were within +/- 2.9 dBA Leq of the modeled noise levels. Based on the acceptable minor differences between measured and modeled existing noise levels, it was assumed that the TNM noise model was validated and therefore capable of predicting future noise levels for this project.

Table 4
US 60 Improvements
TNM 2.5 Model Validation Results (dBA Leq)

Site Number	Receptor Name	Time Period	Activity Category	Noise Abatement Criteria (dBA Leq)	Existing Noise Levels				Receptors Represented
					Measured (dBA Leq)	Modeled (dBA Leq)	Difference (+/-)	Criterion Exceedance	
1	House of Prayer	AM Peak	B/C	67					1 church/4 residences
		9:11 - 9:26 am			64.6	64.8	0.2	no	
		9:26 - 9:42 am			64.9	64.4	-0.5	no	
		midday							
		1:21 - 1:36 pm			64.0	64.6	0.6	no	
		1:36 - 1:51 pm			64.3	62.6	-1.7	no	
		PM Peak							
		3:00 - 3:15 pm			69.0	66.4	-2.6	no	
		3:15 - 3:30 pm			64.6	64.0	-0.6	no	
2	7948 US 60 Residence	AM Peak	B	67					7 residences
		8:48 - 9:03 am			65.8	66.3	0.5	no	
		midday							
		12:58 - 1:13 pm			61.2	64.1	2.9	no	
		PM Peak							
		3:48 - 4:03 pm			64.1	66.2	2.1	no	
4	West Kentucky Technology Park Residences	AM Peak	B	67					10 residences
		7:41 - 7:57 am			61.5	62.3	0.8	no	
		7:57 - 8:12 am			61.8	61.4	-0.4	no	
		Midday							
		11:54 - 12:09 pm			60.0	62.2	2.2	no	
		12:09 - 12:24 pm			62.8	62.3	-0.5	no	
		PM Peak							
		4:39 - 4:54 pm			62.4	63.6	1.2	no	
		4:54 - 5:10 pm			60.1	61.0	0.9	no	
5	Grace Valley Independent Baptist Church	AM Peak	B/C	67					1 church/5 residences
		7:05 - 7:20 am			63.5	61.8	-1.7	no	
		7:20 - 7:35 am			63.5	62	-1.5	no	
		Midday							
		11:15 - 11:31 am			61.1	61.1	0.0	no	
		11:31 - 11:48 am			60.9	61.8	0.9	no	
		PM Peak							
		5:19 - 5:34 pm			62.8	62.8	0.0	no	
		5:34 - 5:49 pm			62.7	62.0	-0.7	no	

4.0 PREDICTED NOISE LEVELS

Once TNM 2.5 has been validated, the next step in the highway traffic noise analysis involved a comparison of predicted noise levels for each alternative with the NAC and existing base year noise levels. Traffic noise levels were predicted for the representative noise sensitive receptors for the No-Build and the Build Alternative. In order to simulate a worst case scenario, TNM uses traffic volumes that will produce the noisiest traffic condition likely to occur for the design year. The "worst hourly traffic noise impact" has been determined to generally occur when truck volumes are the greatest and when traffic flow is free-flowing and at or near level of service (LOS) C conditions.

4.1 Traffic Data

Traffic data for the 2040 design year was based on turning movement forecasts provided as contained in **Appendix B.** This data was used to predict future noise levels for the No-Build and Build Alternatives using the TNM computer program. Since proposed US 60 improvements are expected to operate at LOS C or better for the design year, the noise impact analysis associated with the 2040 No-Build and Build Alternatives was based on average daily traffic (ADT) and design hourly volume (DHV) projections (**Table 5**). The existing travel speed used in the TNM analysis was based on posted speed limits in the project area.

4.2 No-Build Alternative

In order to satisfy National Environmental Policy Act (NEPA) requirements, an evaluation of the No-Build scenario was performed. The analysis of the No-Build Alternative was conducted assuming the current roadway configuration and 2040 No-Build traffic data. As shown in **Table 6, Summary of Existing and No-Build Noise Levels (dBA Leq),** the results of the noise analysis conducted for the No-Build Alternative indicate that noise levels will increase from 0.0 to 1.0 dBA Leq over their existing levels. A 3 dBA increase is generally considered to be barely perceptible to the human ear. Approximately 19 modeled receptors for the No-Build Alternative were determined to have predicted noise levels that would approach (within 1 dBA Leq) or exceed the NAC or substantially exceed existing noise levels.

4.3 Build Alternatives

Alternative 1 (Red) would be constructed on new alignment, beginning east of the bridge over Humphrey Creek south of existing US 60 and would end at the improved 4-lane section near

Table 5
US 60 Improvements
Traffic Data Summary

	From	To	Existing		2040 No-Build		2040 Build	
			ADT	DHV	ADT	DHV	ADT	DHV
US 60	MP 12.0	KY 310	5,900	610	7,300	770	7,300	750
US 60	KY 310	KY 473	6,000	620	7,300	770	7,300	750
US 60	KY 473	MP 1.5	7,300	760	9,000	1,160	9,000	1,160
Alternative 1	MP 12.0	KY 473	-	-	-	-	5,200	560
Alternative 1	KY 473	MP 1.5	-	-	-	-	7,000	910

Table 6
US 60 Improvements
Existing and No Build Noise Levels (dBA Leq)

Receptor	# of Receptors Represented	Activity Category	Noise Abatement Criteria (dBA Leq)	Existing	2040 No-Build Alternative	Increase between Existing and No-Build	Approach or Exceedance of NAC
1	1	B	67	63.5	64.5	1.0	no
2	1	B	67	64.9	65.8	0.9	no
3	1	B	67	63.1	64.1	1.0	no
4	1	B	67	56.6	57.6	1.0	no
5	1	B	67	64.6	65.6	1.0	no
6	1	B	67	63.3	64.3	1.0	no
7	1	B	67	64.4	65.3	0.9	no
8	1	B	67	63.6	64.6	1.0	no
9	1	B	67	65.1	66.0	0.9	yes
10	1	C	67	66.7	67.7	1.0	yes
11	1	C	67	68.4	69.4	1.0	yes
12	1	B	67	56.0	56.9	0.9	no
13	1	B	67	62.8	63.7	0.9	no
14	1	B	67	57.8	58.6	0.8	no
16	1	B	67	60.4	61.3	0.9	no
17	1	B	67	56.6	57.4	0.8	no
19	1	B	67	65.0	65.9	0.9	no
21	1	B	67	65.9	66.7	0.8	yes
22	1	B	67	53.9	54.8	0.9	no
23	1	B	67	67.5	68.3	0.8	yes
24	1	B	67	68.0	68.8	0.8	yes
25	1	B	67	45.5	46.4	0.9	no
27	1	B	67	64.6	65.4	0.8	no
28	1	B	67	64.3	65.1	0.8	no
29	1	B	67	62.5	63.3	0.8	no
30	1	B	67	60.2	61.1	0.9	no
31	1	B	67	64.6	65.5	0.9	no
32	1	B	67	66.4	67.2	0.8	yes
33	1	B	67	63.9	64.7	0.8	no
34	1	B	67	60.7	61.6	0.9	no
35	1	B	67	64.6	65.5	0.9	no
36	1	B	67	64.3	65.1	0.8	no
37	1	B	67	64.2	65.1	0.9	no
38	1	B	67	63.1	63.9	0.8	no
39	1	B	67	62.9	63.7	0.8	no
40	1	B	67	52.0	52.9	0.9	no
42	1	B	67	45.9	46.8	0.9	no
43	1	B	67	45.3	46.1	0.8	no
44	1	B	67	43.1	44.0	0.9	no
45	1	B	67	42.6	43.4	0.8	no
47	1	B	67	42.0	42.8	0.8	no
48	1	B	67	42.2	43.0	0.8	no
49	1	B	67	41.3	42.1	0.8	no
50	1	B	67	40.8	41.5	0.7	no
51	1	B	67	40.1	40.8	0.7	no
52	1	B	67	39.8	40.5	0.7	no
54	1	B	67	62.0	62.9	0.9	no
55	1	B	67	62.1	63.1	1.0	no
56	1	B	67	66.9	67.6	0.7	yes
57	1	B	67	63.0	63.8	0.8	no
58	1	B	67	53.9	54.9	1.0	no
60	1	B	67	65.7	66.5	0.8	yes
61	1	B	67	60.4	61.0	0.6	no
62	1	B	67	60.4	61.0	0.6	no
63	1	B	67	62.4	62.9	0.5	no

Table 6
US 60 Improvements
Existing and No Build Noise Levels (dBA Leq)

Receptor	# of Receptors Represented	Activity Category	Noise Abatement Criteria (dBA Leq)	Existing	2040 No-Build Alternative	Increase between Existing and No-Build	Approach or Exceedance of NAC
64	1	E	72	66.3	66.8	0.5	yes
65	1	E	72	65.2	65.6	0.4	no
66	1	B	67	43.5	44.2	0.7	no
67	1	B	67	43.1	43.7	0.6	no
68	1	B	67	42.7	43.4	0.7	no
69	1	B	67	42.3	43.0	0.7	no
70	1	B	67	42.0	42.7	0.7	no
71	1	B	67	41.3	42.0	0.7	no
72	1	B	67	41.8	42.4	0.6	no
73	1	B	67	41.3	41.9	0.6	no
74	1	B	67	40.9	41.6	0.7	no
75	1	B	67	40.1	40.8	0.7	no
77	1	B	67	39.7	40.4	0.7	no
78	1	B	67	38.9	39.6	0.7	no
79	1	B	67	38.7	39.4	0.7	no
80	1	B	67	38.8	39.5	0.7	no
82	1	B	67	64.8	65.2	0.4	no
83	1	B	67	65.9	66.4	0.5	yes
84	1	B	67	63.4	63.9	0.5	no
85	1	B	67	65.5	66.0	0.5	yes
86	1	B	67	64.8	65.3	0.5	no
87	1	B	67	64.5	64.9	0.4	no
88	1	B	67	64.7	65.1	0.4	no
89	1	B	67	64.7	65.1	0.4	no
91	1	B	67	62.9	63.3	0.4	no
92	1	B	67	64.1	64.5	0.4	no
93	1	B	67	64.6	65.1	0.5	no
95	1	B	67	63.0	63.5	0.5	no
96	1	B	67	66.6	67.1	0.5	yes
98	1	B	67	43.8	44.3	0.5	no
100	1	B	67	61.8	62.2	0.4	no
101	1	B	67	55.6	56.1	0.5	no
102	1	B	67	48.3	48.8	0.5	no
103	1	B	67	44.6	45.1	0.5	no
104	1	B	67	43.7	44.2	0.5	no
105	1	B	67	43.1	43.6	0.5	no
106	1	B	67	43.3	43.8	0.5	no
107	1	B	67	59.9	60.4	0.5	no
108	1	B	67	60.0	60.4	0.4	no
109	1	B	67	60.8	61.3	0.5	no
110	1	B	67	60.5	61.0	0.5	no
111	1	E	72	64.5	65.0	0.5	no
112	1	B	67	59.7	60.1	0.4	no
113	1	B	67	62.8	63.3	0.5	no
114	1	B	67	45.3	45.7	0.4	no
115	1	B	67	63.1	63.6	0.5	no
117	1	B	67	66.7	67.2	0.5	yes
119	1	B	67	41.6	42.5	0.9	no
120	1	B	67	41.2	42.0	0.8	no
121	1	B	67	40.3	41.1	0.8	no
122	1	B	67	40.0	40.8	0.8	no
123	1	B	67	40.4	41.2	0.8	no
124	1	B	67	41.0	41.9	0.9	no
125	1	B	67	42.8	43.6	0.8	no
126	1	B	67	46.2	47.1	0.9	no

Lester Harris Road. Based on its proposed alignment, predicted noise levels for Alternative 1 will range from 38.9 to 74.0 dBA Leq. Two (2) modeled receptors, Receptor Nos. 51 and 98 were determined to have future noise levels that would approach (within 1 dBA Leq) or exceed the 67 dBA Leq NAC (**see Table 7, Summary of Predicted Noise Levels, dBA Leq)**. Receptor No. 98 represents a single-family residence located on a long driveway off US 60 (Kentucky Avenue) between Freedom Boulevard and Amy Lynn Road **(see Figure 4, Noise Receptor Sites)**. The next highest noise levels were predicted for Receiver 51 (66.5 dBA). Based on a review of aerial mapping, Receptor No. 51 is a farm building located at the end of Pine Lane and does not appear to be a residential structure. As anticipated with a new roadway constructed through a rural environment, predicted noise levels for approximately 17 receptors would substantially exceed (> 10 dBA Leq) their existing noise levels.

Alternative 2 (Blue) primarily follows the existing US 60 alignment beginning east of the bridge over Humphrey Creek. The proposed cross-section is a 4-lane divided rural highway with a 5-lane urban section through Kevil. Predicted noise levels for Alternative 2 will range from 39.4 to 75.4 dBA Leq for Receptor 32. Receptor No. 32 represents a single-family residence located on the south side of US 60 (Paducah Road) approximately 370 feet east of the Eagles Nest Plantation entrance. Predicted noise levels for two (2) receptors would substantially exceed (> 10 dBA Leq) their existing noise levels.

Alternative 3 (Green) begins east of the bridge over Humphrey Creek, while creating a new route along the old railroad bed west of Kevil. The alignment then generally follows the existing US 60 alignment through Kevil to the east. The assumed cross-section is a 4-lane divided rural highway with a 5-lane urban section through Kevil. Predicted noise levels for Alternative 3 will range from 38.7 to 72.3 dBA Leq for Receptor 125. Receptor No. 125 represents a single-family residence located Predicted noise levels for six (6) receptors would substantially exceed (> 10 dBA Leq) their existing noise levels.

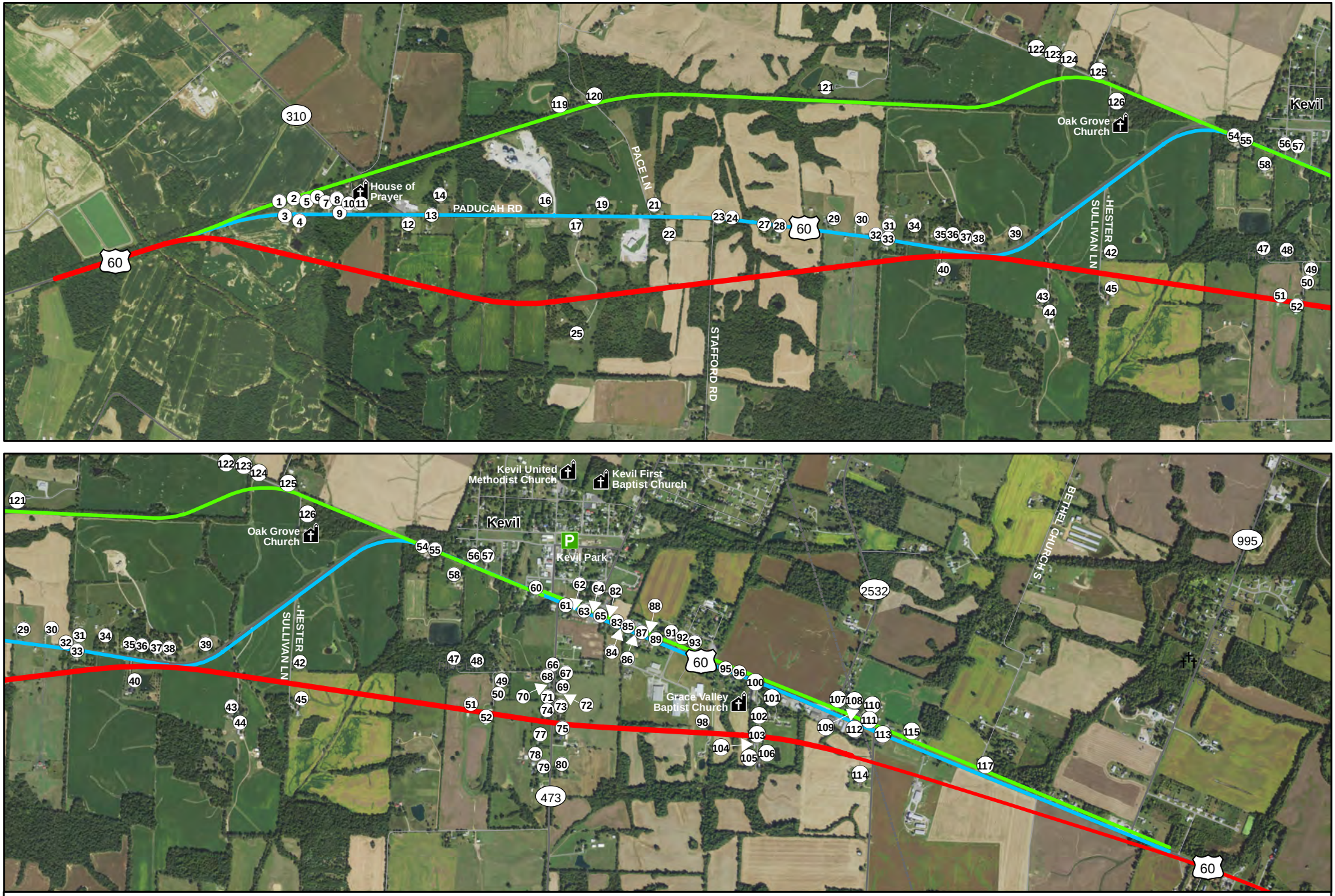
Table 7
US 60 Improvements
Summary of Predicted Noise Levels (dBA Leq)

Receptor	# of Receptors Represented	Activity Category	Noise Abatement Criteria (dBA Leq)	Existing Noise Levels	Predicted Noise Levels (dBA Leq)			
					2040 No-Build Alternative	2040 Build Alternative 1	2040 Build Alternative 2	2040 Build Alternative 3
1	1	B	67	63.5	64.5	59.8	64.3	63.5
2	1	B	67	64.9	65.8	61.2	**66.1**	62.9
3	1	B	67	63.1	64.1	59.8	**67.9**	60.6
4	1	B	67	56.6	57.6	54.5	60.5	54.4
5	1	B	67	64.6	65.6	60.9	65.6	61.9
6	1	B	67	63.3	64.3	59.6	64.5	60.6
7	1	B	67	64.4	65.3	60.7	65.3	61.2
8	1	B	67	63.6	64.6	59.9	64.7	60.4
9	1	B	67	65.1	66.0	61.4	**72.4**	61.5
10	1	C	67	66.7	67.7	63.1	**67.3**	63.3
11	1	C	67	68.4	69.4	64.9	**68.6**	65.0
12	1	B	67	56.0	56.9	52.1	59.2	52.3
13	1	B	67	62.8	63.7	58.7	**67.9**	58.8
14	1	B	67	57.8	58.6	53.5	58.9	53.8
16	1	B	67	60.4	61.3	56.3	61.7	56.3
17	1	B	67	56.6	57.4	52.3	59.2	52.3
19	1	B	67	65.0	65.9	60.6	**71.1**	60.6
21	1	B	67	65.9	66.7	61.4	**74.1**	63.9
22	1	B	67	53.9	54.8	50.8	55.7	49.5
23	1	B	67	67.5	68.3	63.6	65.1	63.6
24	1	B	67	68.0	68.8	64.0	64.9	64.0
25	1	B	67	45.5	46.4	47.4	41.9	38.7
27	1	B	67	64.6	65.4	60.7	63.4	60.5
28	1	B	67	64.3	65.1	60.4	63.6	60.2
29	1	B	67	62.5	63.3	58.6	**66.4**	58.3
30	1	B	67	60.2	61.1	57.1	62.0	56.1
31	1	B	67	64.6	65.5	61.3	64.7	60.5
32	1	B	67	66.4	67.2	63.1	**75.4**	62.5
33	1	B	67	63.9	64.7	61.8	**69.1**	59.9
34	1	B	67	60.7	61.6	58.2	60.8	56.1
35	1	B	67	64.6	65.5	62.3	63.7	60.6
36	1	B	67	64.3	65.1	62.3	63.5	60.2
37	1	B	67	64.2	65.1	63.0	63.3	60.2
38	1	B	67	63.1	63.9	62.5	62.4	58.9
39	1	B	67	62.9	63.7	60.6	62.8	58.5
40	1	B	67	52.0	52.9	54.6	56.4	48.1
42	1	B	67	45.9	46.8	57.1	48.2	43.0
43	1	B	67	45.3	46.1	48.4	47.6	42.6
44	1	B	67	43.1	44.0	45.9	45.1	40.9
45	1	B	67	42.6	43.4	53.3	44.7	40.6
47	1	B	67	42.0	42.8	48.0	43.3	42.4
48	1	B	67	42.2	43.0	47.8	43.3	42.4
49	1	B	67	41.3	42.1	51.9	42.4	41.8
50	1	B	67	40.8	41.5	58.2	41.8	41.0
51	1	B	67	40.1	40.8	**66.5**	41.1	40.1
52	1	B	67	39.8	40.5	58.6	40.7	39.8
54	1	B	67	62.0	62.9	56.7	**73.2**	63.4
55	1	B	67	62.1	63.1	56.8	**72.8**	64.0
56	1	B	67	66.9	67.6	61.5	**66.1**	**67.6**
57	1	B	67	63.0	63.8	57.7	61.7	62.8
58	1	B	67	53.9	54.9	49.0	57.9	55.1
60	1	B	67	65.7	66.5	60.4	**67.7**	**67.6**
61	1	B	67	60.4	61.0	54.7	60.6	60.6
62	1	B	67	60.4	61.0	54.4	60.7	60.6
63	1	B	67	62.4	62.9	55.9	62.5	62.5
64	1	E	72	66.3	66.8	59.4	68.5	68.5
65	1	E	72	65.2	65.6	58.3	67.6	67.6
66	1	B	67	43.5	44.2	47.6	44.4	44.1

Table 7
US 60 Improvements
Summary of Predicted Noise Levels (dBA Leq)

Receptor	# of Receptors Represented	Activity Category	Noise Abatement Criteria (dBA Leq)	Existing Noise Levels	Predicted Noise Levels (dBA Leq)			
					2040 No-Build Alternative	2040 Build Alternative 1	2040 Build Alternative 2	2040 Build Alternative 3
67	1	B	67	43.1	43.7	49.2	43.9	43.6
68	1	B	67	42.7	43.4	49.5	43.6	43.3
69	1	B	67	42.3	43.0	51.7	43.1	42.8
70	1	B	67	42.0	42.7	51.9	42.8	42.5
71	1	B	67	41.5	42.1	55.6	40.7	39.9
72	1	B	67	41.8	42.4	54.7	42.5	42.2
73	1	B	67	41.3	41.9	59.4	42.0	41.6
74	1	B	67	40.9	41.6	63.2	41.7	41.3
75	1	B	67	40.1	40.8	59.1	40.9	40.4
77	1	B	67	39.7	40.4	53.7	40.4	39.8
78	1	B	67	38.9	39.6	47.6	39.6	38.9
79	1	B	67	38.7	39.4	46.3	39.4	38.7
80	1	B	67	38.8	39.5	47.0	39.5	38.9
82	1	B	67	64.8	65.2	57.2	**67.1**	**67.1**
83	1	B	67	65.9	66.4	58.1	**68.5**	**68.5**
84	1	B	67	63.4	63.9	55.8	65.5	65.5
85	1	B	67	65.5	66.0	57.7	**68.4**	**68.4**
86	1	B	67	64.8	65.3	57.0	**67.4**	**67.4**
87	1	B	67	64.5	64.9	56.6	**66.3**	**66.3**
88	1	B	67	64.7	65.1	56.8	**66.8**	**66.8**
89	1	B	67	64.7	65.1	56.9	**66.8**	**66.8**
91	1	B	67	62.9	63.3	55.4	62.0	62.1
92	1	B	67	64.1	64.5	56.5	63.0	63.0
93	1	B	67	64.6	65.1	56.8	63.0	63.0
95	1	B	67	63.0	63.5	56.1	63.3	63.3
96	1	B	67	66.6	67.1	59.4	**67.3**	**67.2**
98	1	B	67	43.8	44.3	**74.0**	45.0	44.8
100	1	B	67	61.8	62.2	55.9	60.2	60.2
101	1	B	67	55.6	56.1	53.7	56.2	56.2
102	1	B	67	48.3	48.8	59.9	49.3	49.3
103	1	B	67	44.6	45.1	62.4	45.6	45.5
104	1	B	67	43.7	44.2	57.3	44.7	44.6
105	1	B	67	43.1	43.6	54.7	43.9	43.9
106	1	B	67	43.3	43.8	54.8	44.1	44.0
107	1	B	67	59.9	60.4	56.1	60.4	60.4
108	1	B	67	60.0	60.4	56.1	60.4	60.4
109	1	B	67	60.8	61.3	56.7	60.9	60.9
110	1	B	67	60.5	61.0	56.5	60.5	60.5
111	1	E	72	64.5	65.0	59.9	65.1	65.1
112	1	B	67	59.7	60.1	58.0	58.7	58.8
114	1	B	67	45.3	45.7	54.6	42.9	42.9
120	1	B	67	41.2	42.0	40.3	43.4	**71.4**
121	1	B	67	40.3	41.1	40.1	42.3	59.2
122	1	B	67	40.0	40.8	38.9	41.0	51.5
123	1	B	67	40.4	41.2	39.3	41.3	54.0
124	1	B	67	41.0	41.9	39.8	42.1	59.1
125	1	B	67	42.8	43.6	40.8	44.1	**72.3**
126	1	B	67	46.2	47.1	43.2	47.8	54.1
						18 impacted receptors	23 impacted receptors	16 impacted receptors

- Receptors with impacts
59.9 - substantial impact (> 10 dBA Leq)
71.4 - approach or exceedance



Alternative 1
Alternative 2
Alternative 3

① Noise Receptor Site

0 0.25 0.5 Mi

Noise Receptor Sites

US 60

Ballard and McCracken Counties

KYTC Item No. 01-115.00, 01-115.10, 01-118.00

Figure 4

5.0 TRAFFIC NOISE IMPACTS

As defined by the KYTC *Noise Analysis and Abatement Policy,* dated July 1, 2015, a traffic noise impact is considered to occur when either of the following is determined:

1) The noise level predicted for the design year approaches or exceeds the NAC as established in 23 CFR 772. **"Approach" is defined as within 1 dBA for the land use category affected as shown in Table 1.**

2) A substantial increase over existing noise levels is predicted for the design year. **A substantial increase is defined as an increase in noise levels of 10 dBA or more.** This criterion is independent of the NAC and may result in a defined noise impact even though the NAC may not be approached or exceeded.

Based on TNM modeling, design year (2040) traffic data and the most current design files for the US 60 improvements, traffic noise impacts are predicted to occur as a result of the construction of all 3 build alternatives. These impacts are described as follows:

Alternative 1 - Predicted noise levels will range from 38.9 to 74.0 dBA Leq. Two (2) modeled receptors, Receptor Nos. 51 and 98 were determined to have future noise levels that would approach (within 1 dBA Leq) or exceed the 67 dBA Leq NAC. Both of these receptors have been identified as potentially relocated or displaced by the proposed alignment. Predicted noise levels for Receptor No. 51 and approximately 16 other receptors would substantially exceed (> 10 dBA Leq) their existing noise levels. Upon review of these receptor locations, two (2) of the receptors are considered as isolated residences and eleven (11) of the receptors would be displaced or relocated by the project.

Alternative 2 - Predicted noise levels will range from 39.4 to 75.4 dBA Leq. Approximately 23 receptors were determined to have future noise levels that would approach or exceed their NAC. Most of these occur along existing US 60 through Kevil. Upon review, approximately 16 receptors would potentially be displaced or relocated by the widening improvements with at least 3 receptors representing isolated residences. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). Predicted noise levels for two (2) receptors would also substantially exceed (> 10 dBA Leq) their existing noise levels. However, both of these receptors would be displaced or relocated.

Alternative 3 - This alternative begins on new alignment along the old railroad bed west of Kevil but follows the existing US 60 alignment through Kevil identical to Alternative 2. Predicted noise levels for Alternative 3 will range from 38.7 to 72.3 dBA Leq. Approximately 11 receptors were determined to have future noise levels that would approach or exceed their NAC. As identified for Alternative 2, most of these occur along existing US 60 through Kevil. Upon review, approximately seven (7) receptors would potentially be displaced or relocated by the widening improvements. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). Predicted noise levels for four (4) receptors would also substantially exceed (> 10 dBA Leq) their existing noise levels. However, all of these receptors would be considered isolated residences.

6.0 NOISE ABATEMENT CONSIDERATIONS

KYTC has developed a policy consistent with FHWA guidelines to determine the need, feasibility, and reasonableness of noise abatement measures for all major highway projects. In 23 CFR Part 772, FHWA requires that noise abatement measures be considered when traffic noise impacts are identified for Type I Federal projects. The FHWA offers a number of measures for abating or eliminating noise impacts. The primary means of mitigating noise impacts, as offered by the FHWA, are listed as follows:

- 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.
- 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.
- Alteration of horizontal and vertical alignments.
- Acquisition of real property or interests therein (predominantly unimproved property) to serve as a buffer zone to preempt development that would be adversely impacted by traffic noise.
- Noise insulation of Activity Category D land use facilities. Post-installation maintenance and operational costs for noise insulation are not eligible for Federal-aid funding.

KYTC is not part of a FHWA approved quiet pavement pilot program and therefore, the use of quiet pavement is not an acceptable option for providing noise abatement for a project.

In accordance with 23 CFR 772.13(c), the following noise abatement measures were considered as a means to reduce or eliminate traffic noise impacts.

Traffic Management Measures: Traffic management measures were not considered feasible for abating noise impacts for this project. Measures such as installation of additional traffic control devices, prohibition of vehicle types, time-use restrictions, speed limit reductions, and exclusive lane designations would be detrimental to the proposed project's ability to function as intended. Restricting truck traffic would be unreasonable, very difficult to enforce, and was considered a disincentive to economic development.

Alteration of Horizontal and Vertical Alignments: KYTC is in the process of integrating noise considerations into the selection of alternatives and into the horizontal and vertical design of highways. The selection of a preferred alignment usually includes shifting the alignment both vertically and horizontally, wherever feasible, to minimize impacts to adjacent land uses. Both vertical and horizontal alignments are altered to minimize noise impacts where other factors are not prohibitive. Since this project consists primarily of interchange improvements, opportunities for altering the vertical and horizontal alignments would be limited. Based on the proposed project's topography, it is likely that the final design would result in noise levels similar to those predicted for this study.

Acquisition of Property Rights or Acquisition of Property: Visual screening in the form of privacy fencing (wood) and/or landscaping may be proposed to help reduce the psychological impacts of the proposed project. However, these measures have been determined not to be as effective as the construction of noise walls and would not be the responsibility of KYTC.

Noise Insulation of Public Use or Nonprofit Institutional Structures: KYTC's policy is consistent with FHWA's interior noise level criteria policy on noise insulation and air conditioning compliance. This noise abatement measure option applies only to public or non-profit institutional use buildings.

Construction of Noise Barriers: KYTC has established a policy for determining the feasibility and reasonableness of when and where barriers should be constructed. In order to be implemented, a noise mitigation measure must be determined to be both feasible and reasonable. These considerations are discussed in more detail as follows:

Feasibility

When determining the acoustic feasibility of a proposed noise abatement measure, KYTC considers whether the measure provides a substantial noised reduction ($\geq$ 5 dBA Leq) for a reasonable number of impacted receptors (minimum of three (3) impacted receptors) to warrant consideration. Therefore, if a proposed barrier does not provide a minimum of 5 dBA reduction for at least 3 impacted receptors, it will not be considered acoustically feasible.

Engineering or constructability issues may render an abatement measure infeasible. In determining if site characteristics are suitable for barrier construction, KYTC considers numerous

factors including safety, maintenance, drainage and accessibility. Engineering judgment may dictate that a barrier is not feasible if:

1) A substantial noise reduction (>5 dBA Leq) for three (3) or more impacted receptors is not achievable.
2) The barrier poses overriding safety (i.e. visibility or sight distance) issues or maintenance (i.e. drainage or right of way access) problems as determined by the AASHTO Green Book, Roadside Design Guide or Manual of Uniform Traffic Control Devices (MUTCD).

Based on a preliminary noise analysis conducted for the proposed US 60 improvements, traffic noise impacts were predicted to occur for all three build alternatives considered.

Alternative 1 (Red) - Predicted noise levels for Alternative 1 would range from 38.9 to 74.0 dBA Leq. Approximately 18 receptors were determined to have noise impacts but only two (2) receptors would have noise levels that would approach (within 1 dBA Leq) or exceed the 67 dBA Leq NAC. Predicted noise levels for approximately 17 receptors would substantially exceed (> 10 dBA Leq) their existing noise levels. Upon review of these receptor locations, two (2) of the receptors are considered as isolated residences and eleven (11) of the receptors would be displaced or relocated by the project. Based on the location of the remaining receptors with predicted impacts, a substantial noise reduction is not achievable for a reasonable number of impacted receptors. Therefore, noise barriers were not considered acoustically feasible for this alternative and none were proposed.

Alternative 2 (Blue) - Predicted noise levels for Alternative 2 will range from 39.4 to 75.4 dBA Leq. Approximately 23 receptors were determined to have future noise levels that would approach or exceed their NAC. However, 16 receptors would potentially be displaced or relocated by the widening improvements with at least 3 receptors representing isolated residences. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). A proposed barrier at this location would pose overriding sight distance and visibility issues for motorists. Predicted noise levels for two (2) receptors would also substantially exceed (> 10 dBA Leq) their existing noise levels. Both of these receptors would be displaced or relocated. Potential noise barriers were not considered acoustically feasible for this alternative and none were proposed.

Alternative 3 (Green) – Predicted noise levels for Alternative 3 will range from 38.7 to 72.3 dBA Leq. Approximately 11 receptors were determined to have future noise levels that would approach or exceed their NAC. Upon review, approximately seven (7) receptors would potentially be displaced or relocated by the widening improvements. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). As discussed for Alternative 2, a proposed barrier at this location would pose overriding sight distance and visibility issues for motorists. For the section of Alternative 3 on new alignment, predicted noise levels for four (4) receptors would also substantially exceed (> 10 dBA Leq) their existing noise levels. However, all of these receptors would be considered isolated residences. Since a substantial noise reduction would not be achievable for a reasonable number of impacted receptors, noise barriers were not considered acoustically feasible for this alternative and none were proposed.

7.0 SUMMARY AND CONCLUSIONS

A traffic noise impact analysis was conducted for the proposed US 60 improvements. The analysis was performed in accordance with the requirements of Title 23, Part 772 of the Code of Federal Regulations (CFR), "*Procedures for Abatement of Highway Traffic Noise and Construction Noise*" and the Kentucky Transportation Cabinet's (KYTC) *Noise Analysis and Abatement Policy* (dated July 1, 2015).

Traffic noise impacts occur when noise levels generated by the proposed project approach or exceed the NAC, or when predicted noise levels substantially exceed (greater than 10 dBA Leq) existing noise levels. Based on TNM modeling, design year (2040) traffic data and the most current design files for project alternatives, traffic noise impacts are predicted to occur as a result of the construction of all 3 build alternatives.

The construction of noise barriers was considered for abating noise impacts generated by the proposed project. KYTC has established a policy for determining the feasibility and reasonableness of when and where barriers should be constructed. In order to be implemented, a noise mitigation measure must be determined to be both feasible and reasonable.

Upon review, Alternative 1 represents an improvement primarily on new alignment. As described by the existing land use, noise sensitive receptors are relatively few and are dispersed and scattered throughout the study corridor. After consideration of potential relocations or displacements by the proposed Alternative 1 alignment, these receptors represent isolated residences in vicinity to the proposed alignment. Substantial noise reduction for a reasonable number of impacted receptors would not be achievable. Construction of noise walls was therefore not considered feasible for Alternative 1.

Alternatives 2 and 3 represent widening improvements to existing US 60 through Kevil. As anticipated, future noise levels are predicted to increase for those sensitive land uses (residences) directly adjacent to the roadway.

For Alternative 2, approximately 23 receptors were determined to have future noise levels that would approach or exceed their NAC. However, 16 receptors would potentially be displaced or relocated by the widening improvements with at least 3 receptors representing isolated

residences. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). A proposed barrier at this location would pose overriding sight distance and visibility issues for motorists. Potential noise barriers were not considered acoustically feasible for this alternative and none were proposed.

Approximately 11 receptors were determined to have future noise levels that would approach or exceed their NAC for Alternative 3. At least seven (7) receptors would potentially be displaced or relocated by the widening improvements. Four (4) of the remaining receptors were located adjacent to US 60 in Kevil and currently have direct access (driveways). As discussed for Alternative 2, a proposed barrier at this location would pose overriding sight distance and visibility issues for motorists. For the section of Alternative 3 on new alignment, predicted noise levels for four (4) receptors would also substantially exceed (> 10 dBA Leq) their existing noise levels. However, all of these receptors would be considered isolated residences. Since a substantial noise reduction would not be achievable for a reasonable number of impacted receptors, noise barriers were not considered acoustically feasible for this alternative and none were proposed.

The opportunities for minimizing traffic noise as a result of the project are limited. Based on a preliminary noise analysis, the construction of noise barriers are not acoustically feasible and therefore, not reasonable for any alternative. Alignment shifts would also likely result in increased environmental impacts, relocations and construction costs. Therefore, additional noise abatement measures were determined not to be effective as described in 23 CFR 772.13(c) and none were proposed.

8.0 INDIRECT AND CUMULATIVE IMPACTS

Indirect impacts are those impacts that are caused by the action and are later in time and further removed in distance, but are still reasonably foreseeable. The purpose of the project is to improve mobility and safety for the US 60 corridor in eastern Ballard County. US 60 is the only east-west arterial link in Kentucky west of Paducah, leading to the only Ohio River highway crossing for an 80-mile stretch. The project is anticipated to have positive indirect impacts as congestion and heavy truck traffic are reduced through Kevil. As a result of this project, noise levels for those residential and sensitive noise land uses may decrease. No known sources of additional traffic, such as the construction of indirect commercial or industrial development, are part of this study. Therefore, the proposed project is not anticipated have any negative indirect impacts on traffic noise.

Cumulative impacts occur when the effects (both direct and indirect) of the action interact with the effects of other actions. Based on a review of the FY 2018 – 2024 Enacted Highway Plan, KYTC plans to improve sections of US 60 from Paducah to east of La Center. These improvements have been accounted for in the US 60 traffic projections and therefore addressed in this study. Therefore, it was assumed there would be no cumulative impacts for this study.

9.0 CONSTRUCTION NOISE

There would be unavoidable short-term noise impacts as a result of project construction. The primary source of noise expected would be generated from construction activities such as earth removal, hauling, grading, and paving. For this project, construction is not anticipated to last for a long period of time. If it is likely that noise construction will persist longer than two years, noise abatement measures may be necessary during construction to restrict noise levels in the vicinity of noise sensitive sites. These measures may include, but are not necessarily limited to the following:

- Provide shielding of equipment with acoustic barriers.
- Restrict certain types of work to specific times during the day.
- Require source control on equipment such as mufflers.
- Other measures to reduce noise impacts.

10.0 COORDINATION WITH LOCAL OFFICIALS

A copy of this traffic noise impact analysis may be made available to the following local officials as part of the coordination efforts to help minimize highway noise related impacts to adjacent properties. Approval of land uses adjacent to a highway that are typically sensitive to noise should be an informed decision-making process. If appropriate, visual screening may be suggested or considered to help reduce the psychological impacts of the project. The final decision on implementation of abatement measures will be made after completion of the project design and the public involvement process, including coordinating with and providing predicted noise information on the Build Alternative to local officials per the KYTC *Noise Analysis and Abatement Policy*.

APPENDIX A

Sound Level Meter Calibration Certificates,

Field Monitoring Data Sheets and Sound Meter Output Data

Calibration Certificate

Certificate Number 2018005268
Customer:
The Modal Shop
3149 East Kemper Road
Cincinnati, OH 45241, United States

Model Number	LxT1	***Procedure Number***	D0001.8378
Serial Number	0005625	***Technician***	Ron Harris
Test Results	**Pass**	***Calibration Date***	23 May 2018
Initial Condition	As Manufactured	***Calibration Due***	
Description	SoundTrack LxT Class 1 Class 1 Sound Level Meter Firmware Revision: 2.302	***Temperature***	23.42 °C ± 0.25 °C
		Humidity	50.7 %RH ± 2.0 %RH
		Static Pressure	86.02 kPa ± 0.13 kPa

Evaluation Method Tested electrically using Larson Davis PRMLxT1 S/N 046882 and a 12.0 pF capacitor to simulate microphone capacitance. Data reported in dB re 20 µPa assuming a microphone sensitivity of 50.0 mV/Pa.

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8384:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005. **Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.**

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev J Supporting Firmware Version 2.301, 2015-04-30

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

Larson Davis, a division of PCB Piezotronics, Inc
1681 West 820 North
Provo, UT 84601, United States
716-684-0001

ACCREDITED Cert. #3822.01

LARSON DAVIS
A PCB PIEZOTRONICS DIV.

Calibration Certificate

Certificate Number 2018005269
Customer:
The Modal Shop
3149 East Kemper Road
Cincinnati, OH 45241, United States

Model Number	LxT1		***Procedure Number***	D0001.8384	
Serial Number	0005625		***Technician***	Ron Harris	
Test Results	**Pass**		***Calibration Date***	23 May 2018	
Initial Condition	As Manufactured		***Calibration Due***		
			Temperature	23.59 °C	± 0.25 °C
Description	SoundTrack LxT Class 1		***Humidity***	50.4 %RH	± 2.0 %RH
	Class 1 Sound Level Meter		***Static Pressure***	85.99 kPa	± 0.13 kPa
	Firmware Revision: 2.302				

Evaluation Method ***Tested with:*** ***Data reported in dB re 20 µPa.***

Larson Davis PRMLxT1. S/N 046882
PCB 377B02. S/N 304769
Larson Davis CAL200. S/N 9079
Larson Davis CAL291. S/N 0108

Compliance Standards Compliant to Manufacturer Specifications and the following standards when combined with Calibration Certificate from procedure D0001.8378:

IEC 60651:2001 Type 1	ANSI S1.4-2014 Class 1
IEC 60804:2000 Type 1	ANSI S1.4 (R2006) Type 1
IEC 61252:2002	ANSI S1.11 (R2009) Class 1
IEC 61260:2001 Class 1	ANSI S1.25 (R2007)
IEC 61672:2013 Class 1	ANSI S1.43 (R2007) Type 1

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the International System of Units (SI) through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Correction data from Larson Davis LxT Manual for SoundTrack LxT & SoundExpert Lxt, I770.01 Rev J Supporting Firmware Version 2.301, 2015-04-30

For 1/4" microphones, the Larson Davis ADP024 1/4" to 1/2" adaptor is used with the calibrators and the Larson Davis ADP043 1/4" to 1/2" adaptor is used with the preamplifier.

Calibration Check Frequency: 1000 Hz; Reference Sound Pressure Level: 114 dB re 20 µPa

Periodic tests were performed in accordance with precedures from IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part3.

Pattern approval for IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1 successfully completed by Physikalisch-Technische Bundesanstalt (PTB) on 2007-10-09 reference number PTB-1.72-4034218.

The sound level meter submitted for testing successfully completed the periodic tests of IEC 61672-3:2013 / ANSI/ASA S1.4-2014/Part 3, for the environmental conditions under which the tests were performed. As evidence was publicly available, from an independent testing organization responsible for approving the results of pattern-evaluation tests performed in accordance with IEC 61672-2:2013 / ANSI/ASA S1.4-2014/Part 2, to demonstrate that the model of sound level meter fully conformed to the class 1 specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1; the sound level meter submitted for testing conforms to the class 1specifications in IEC 61672-1:2013 / ANSI/ASA S1.4-2014/Part 1.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Larson Davis CAL291 Residual Intensity Calibrator	2017-09-19	2018-09-19	001250
SRS DS360 Ultra Low Distortion Generator	2017-06-23	2018-06-23	006311
Hart Scientific 2626-S Humidity/Temperature Sensor	2017-06-11	2018-06-11	006943
Larson Davis CAL200 Acoustic Calibrator	2017-07-25	2018-07-25	007027
Larson Davis Model 831	2018-02-28	2019-02-28	007182
PCB 377A13 1/2 inch Prepolarized Pressure Microphone	2018-03-07	2019-03-07	007185

Acoustic Calibration

Measured according to IEC 61672-3:2013 10 and ANSI S1.4-2014 Part 3: 10

Measurement	Test Result [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
1000 Hz	114.00	113.80	114.20	0.14	Pass

Acoustic Signal Tests, C-weighting

Measured according to IEC 61672-3:2013 12 and ANSI S1.4-2014 Part 3: 12 using a comparison coupler with Unit Under Test (UUT) and reference SLM using slow time-weighted sound level for compliance to IEC 61672-1:2013 5.5; ANSI S1.4-2014 Part 1: 5.5

Frequency [Hz]	Test Result [dB]	Expected [dB]	Lower Limit [dB]	Upper Limit [dB]	Expanded Uncertainty [dB]	Result
125	-0.22	-0.20	-1.20	0.80	0.23	Pass
1000	0.09	0.00	-0.70	0.70	0.23	Pass
8000	-2.83	-3.00	-5.50	-1.50	0.32	Pass

-- End of measurement results--

Self-generated Noise

Measured according to IEC 61672-3:2013 11.1 and ANSI S1.4-2014 Part 3: 11.1

Measurement	Test Result [dB]
A-weighted	40.36

-- End of measurement results--

THE MODAL SHOP INC.
A PCB GROUP CO.

3149 East Kemper Rd.
Cincinnati, OH 45241
Ph : 513-351-9919
Fax: 513-458-2172
www.modalshop.com

~Certificate of Calibration~

Manufacturer: PCB
Model Number: 377B02
Serial Number: 100948
Asset ID:
Description: Free-Field Microphone

Customer: TMS Rental
Address:

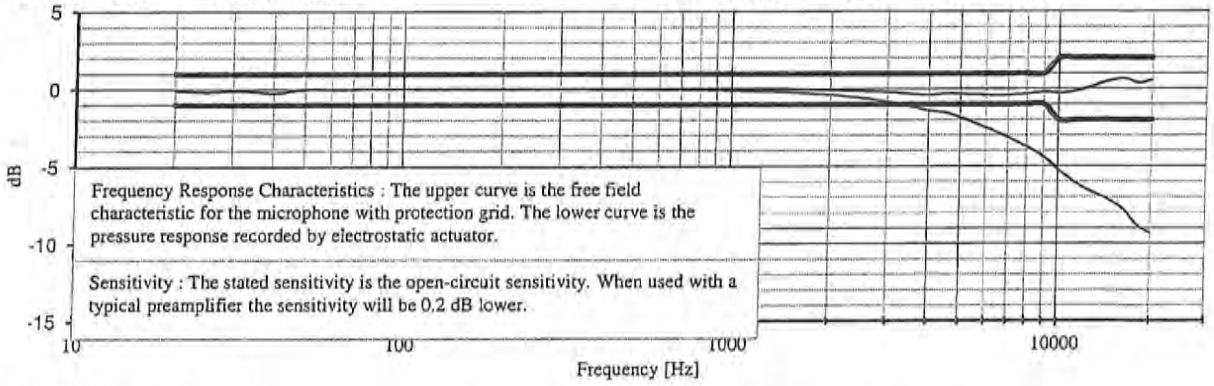
Calibration Date: Jul 31, 2018 15:08:03
Due Date:

Sensitivity:	**250 Hz**	**1 kHz**	
	-27.63	-27.73	dB re. 1V/Pa
	41.52	41.08	mV/Pa

Temperature:	73 (23)	°F (°C)
Humidity:	55	%
Ambient Pressure:	990.9	mbar

Cal. Results: In Tolerance

Polarization Voltage: 0 VDC



Traceability: The calibration is traceable through NIST Project A1633.

Notes:
Calibration results relate only to the items calibrated.
This certificate may not be reproduced, except in full, without written permission.
This calibration is performed in compliance with ISO 9001, ISO 17025 and ANSI Z540.
Measurement uncertainty (250 Hz sensitivity calibration) at 95% confidence level: 0.30 dB
Calibrated per procedure PRD-P204.

User Note: As Found / As Left: In Tolerance.

Frequency Response with reference to level at 250 Hz

Frequency (Hz)	Upper (dB)	Frequency (Hz)	Upper (dB)	Frequency (Hz)	Upper (dB)	Frequency (Hz)	Upper (dB)
20	-0.10	630	0.00	4500	-0.30		
25	-0.17	800	0.03	5000	-0.33		
31.5	-0.08	1000	0.02	5600	-0.38		
40	-0.24	1120	0.02	6300	-0.41		
50	0.01	1250	0.01	7100	-0.40		
63	-0.02	1400	0.00	8000	-0.32		
80	0.02	1600	-0.03	9000	-0.20		
100	0.01	1800	-0.05	10000	-0.26		
125	0.01	2000	-0.07	11200	-0.16		
160	0.00	2240	-0.10	12500	0.12		
200	0.00	2500	-0.13	14000	0.46		
250	0.00	2800	-0.18	16000	0.66		
315	0.01	3150	-0.24	18000	0.37		
400	0.00	3550	-0.33	20000	0.60		
500	0.02	4000	-0.40				

Technician: Ed Devlin

Approval: Edward A. Devlin

Reference Equipment Used:

Manuf.	*Model*	*Serial*	*Cal. Date*	*Due Date*
GRAS	40AG	9542	2/22/2018	2/22/2019

ACCREDITED
Calibration Lab
CALIBRATION CERT 2649.01

Calibration Certificate

Certificate Number 2018003154

Customer:
PCB Piezotronics Inc.
3425 Walden Avenue
Depew, NY 14043, US
888-684-0013

Model Number	CAL200	***Procedure Number***	D0001.8386		
Serial Number	15533	***Technician***	Scott Montgomery		
Test Results	**Pass**	***Calibration Date***	29 Mar 2018		
Initial Condition	As Manufactured	***Calibration Due***			
		Temperature	24	°C	± 0.3 °C
Description	Larson Davis CAL200 Acoustic Calibrator	***Humidity***	36	%RH	± 3 %RH
		Static Pressure	101.0	kPa	± 1 kPa

Evaluation Method The data is aquired by the insert voltage calibration method using the reference microphone's open circuit sensitivity. Data reported in dB re 20 µPa.

Compliance Standards Compliant to Manufacturer Specifications per D0001.8190 and the following standards:
IEC 60942:2017 ANSI S1.40-2006

Issuing lab certifies that the instrument described above meets or exceeds all specifications as stated in the referenced procedure (unless otherwise noted). It has been calibrated using measurement standards traceable to the SI through the National Institute of Standards and Technology (NIST), or other national measurement institutes, and meets the requirements of ISO/IEC 17025:2005.
Test points marked with a ‡ in the uncertainties column do not fall within this laboratory's scope of accreditation.

The quality system is registered to ISO 9001:2008.

This calibration is a direct comparison of the unit under test to the listed reference standards and did not involve any sampling plans to complete. No allowance has been made for the instability of the test device due to use, time, etc. Such allowances would be made by the customer as needed.

The uncertainties were computed in accordance with the ISO Guide to the Expression of Uncertainty in Measurement (GUM). A coverage factor of approximately 2 sigma (k=2) has been applied to the standard uncertainty to express the expanded uncertainty at approximately 95% confidence level.

Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/06/2017	09/06/2018	001021
Larson Davis Model 2900 Real Time Analyzer	04/10/2017	04/10/2018	001051
Microphone Calibration System	03/07/2018	03/07/2019	005446
1/2" Preamplifier	10/05/2017	10/05/2018	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/08/2017	08/08/2018	006507
1/2 inch Microphone - RI - 200V	04/24/2017	04/24/2018	006510
Pressure Transducer	06/01/2017	06/01/2018	007310

Lxt_001

NOISE RECEPTOR SITE DATA SHEET

Job Name: US60 Job Number: 18402 Calibration Check: 113.90

Receptor Site No: 1 Event No: AM ___ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 2:59 End Time: 3:15

Receptor Name: House of Prayer

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 4 Other: 1

Site Description: church and picnic tables / swings

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):			69.0	
Traffic Count on Existing Roadway:	___ bound	___ bound	east → bound	west ← bound
Autos:			67	48
Medium Trucks:			7	6
Heavy Trucks:			12	10
Buses:			3	—
Motorcycles:			—	—

Distance from Existing Road: 75' Height Above or Below Existing Road: _____

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: yes Percent Slope: _____ Which way is it inclining: west

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

PM: Temp (F) 66.2 RH 36 % Wind Speed 1.6 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: loud tractor trailer

Both: _____

Summary	
File Name on Meter	LxT_Data.001
File Name on PC	SLM_0005625_LxT_Data_001.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 14:59:59
Stop	2018-10-22 15:15:05
Duration	00:15:05.4
Run Time	00:15:05.4
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:43
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA_{Seq}	69.0
LASE	98.6
EAS	798.078
EAS8	25.386
EAS40	126.931
$LZ_{Speak\ (max)}$	2018-10-22 15:04:30

Lxt_002

NOISE RECEPTOR SITE DATA SHEET

Job Name: US60 Job Number: 18402 Calibration Check: 113.90

Receptor Site No: 1 Event No: AM ___ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 3:15 End Time: 3:30

Receptor Name: House of Prayer

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 4 Other: 1

Site Description: church and picnic tables / swings

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	_____		_____	
Traffic Count on Existing Roadway:	_____ bound	_____ bound	east → _____ bound	west ← _____ bound
Autos:	_____	_____	_____	54
Medium Trucks:	_____	_____	_____	4
Heavy Trucks:	_____	_____	_____	8
Buses:	_____	_____	_____	—
Motorcycles:	_____	_____	_____	—

Distance from Existing Road: 75' Height Above or (Below) Existing Road: _____

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: yes Percent Slope: _____ Which way is it inclining: west

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 65.2 RH 37 % Wind Speed 1.9 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: mixer truck on side road 3:26 pm

Both: _____

Summary	
File Name on Meter	LxT_Data.002
File Name on PC	SLM_0005625_LxT_Data_002.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 15:15:12
Stop	2018-10-22 15:30:16
Duration	00:15:03.5
Run Time	00:15:03.5
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LASeq	64.6
LASE	94.2
EAS	290.557
EAS8	9.262
EAS40	46.309
LZSpeak (max)	2018-10-22 15:22:22

NOISE RECEPTOR SITE DATA SHEET

Lxt_003

Job Name: US60 Job Number: 18402 Calibration Check: 113.90

Receptor Site No: 2 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 3:48 End Time: 4:03

Receptor Name: Smith's residence

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 6-7 Other: ____

Site Description: 7948 US60 front residence

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	_____		64.1	
Traffic Count on Existing Roadway:	_____ bound	_____ bound	→ east bound	← west bound
Autos:	_____	_____	38	58
Medium Trucks:	_____	_____	7	2
Heavy Trucks:	_____	_____	3	7
Buses:	_____	_____	—	—
Motorcycles:	_____	_____	—	—

Distance from Existing Road: 95' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 65 RH 34 % Wind Speed 4.6 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.003
File Name on PC	SLM_0005625_LxT_Data_003.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 15:48:30
Stop	2018-10-22 16:03:34
Duration	00:15:04.1
Run Time	00:15:04.1
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA_{Seq}	64.1
LASE	93.7
EAS	260.130
EAS8	8.286
EAS40	41.432
$LZ_{Speak\ (max)}$	2018-10-22 15:49:36

NOISE RECEPTOR SITE DATA SHEET

Lxt_004

Job Name: VS60 Job Number: 18402 Calibration Check: 113.90

Receptor Site No: 3 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 4:14 End Time: 4:29

Receptor Name: Pine Lane residence

Purpose of Receptors: Ambient Only (Y or N): Y No. of Residences: 4 Other: ____

Site Description: residence near proposed alignment

Intersecting Roadway Name: Gage Road

	AM	PM
Leq (dBA):	_____	52.3

Traffic Count on Existing Roadway:

	____ bound	____ bound	____ bound	____ bound
Autos:				
Medium Trucks:				
Heavy Trucks:				
Buses:				
Motorcycles:				

Distance from Existing Road: _____ Height Above or Below Existing Road: _____

Existing Speed Limit: _____ Average Speed of Vehicles: _____

Is the road at a grade: _____ Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: _____

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 63 RH 37 % Wind Speed 2.5 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.004
File Name on PC	SLM_0005625_LxT_Data_004.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 16:14:56
Stop	2018-10-22 16:29:59
Duration	00:15:02.5
Run Time	00:15:02.5
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA_{Seq}	52.3
LASE	81.9
EAS	17.020
EAS8	543.143
EAS40	2.716
$LZ_{Speak\ (max)}$	2018-10-22 16:23:49

Lxt_005

NOISE RECEPTOR SITE DATA SHEET

Job Name: US 60 Job Number: 18402 Calibration Check: 113.90

Receptor Site No: 4 Event No: AM ___ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 4:39 End Time: 4:54

Receptor Name: West KY Technology Park

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 10 Other: ___

Site Description: front row of residences

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	_____		62.4	
Traffic Count on Existing Roadway:			→	←
	_____ bound	_____ bound	east bound	west bound
Autos:	_____	_____	63	95
Medium Trucks:	_____	_____	3	9
Heavy Trucks:	_____	_____	5	9
Buses:	_____	_____	–	1
Motorcycles:	_____	_____	–	–

Distance from Existing Road: 100' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 35 mph Average Speed of Vehicles: 35 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

PM: Temp (F) 60.9 RH 44 % Wind Speed 2.7 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: birds, weedeater

Both: _____

Summary	
File Name on Meter	LxT_Data.005
File Name on PC	SLM_0005625_LxT_Data_005.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 16:39:37
Stop	2018-10-22 16:54:46
Duration	00:15:09.5
Run Time	00:15:09.5
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA$_{eq}$	62.4
LASE	92.0
EAS	175.179
EAS8	5.547
EAS40	27.736
LZ$_{Speak\ (max)}$	2018-10-22 16:54:37

Lxt_006

NOISE RECEPTOR SITE DATA SHEET

Job Name: US 60 Job Number: 18402 Calibration Check: 113.90

Receptor Site No: 4 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 4:54 End Time: 5:10

Receptor Name: West KY Technology Park

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 10 Other: ____

Site Description: front row of residences

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	_____		60.1	
Traffic Count on Existing Roadway:			→	←
	_____ bound	_____ bound	east bound	west bound
Autos:	_____	_____	54	104
Medium Trucks:	_____	_____	2	2
Heavy Trucks:	_____	_____	2	3
Buses:	_____	_____	—	—
Motorcycles:	_____	_____	—	—

Distance from Existing Road: 100' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 35 mph Average Speed of Vehicles: 35 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 62° RH 40 % Wind Speed 2.8 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: birds; weedeater at 5:05 pm

Both: _____

Summary	
File Name on Meter	LxT_Data.006
File Name on PC	SLM_0005625_LxT_Data_006.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 16:54:54
Stop	2018-10-22 17:10:00
Duration	00:15:05.7
Run Time	00:15:05.7
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA_{Seq}	60.1
LASE	89.7
EAS	102.965
EAS8	3.274
EAS40	16.371
$LZ_{Speak\ (max)}$	2018-10-22 17:04:35

NOISE RECEPTOR SITE DATA SHEET

Lxt_007

Job Name: US60 Job Number: 18402 Calibration Check: 113.99

Receptor Site No: 5 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 5:19 End Time: 5:34

Receptor Name: Grace Valley Independent Baptist Church

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 5 Other: 1

Site Description: front of church

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):			62.8	
Traffic Count on Existing Roadway:	→	←	→	←
	____ bound	____ bound	east bound	west bound
Autos:			44	96
Medium Trucks:			4	3
Heavy Trucks:			6	4
Buses:			—	—
Motorcycles:			—	2

Distance from Existing Road: 125' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 45 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 58 RH 51 % Wind Speed 0.7 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.007
File Name on PC	SLM_0005625_LxT_Data_007.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 17:19:41
Stop	2018-10-22 17:34:45
Duration	00:15:04.6
Run Time	00:15:04.6
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA_{Seq}	62.8
LASE	92.4
EAS	193.055
EAS8	6.146
EAS40	30.732
$LZ_{Speak\ (max)}$	2018-10-22 17:31:44

NOISE RECEPTOR SITE DATA SHEET

Lxt_008

Job Name: US 60 Job Number: 18402 Calibration Check: 113.99

Receptor Site No: 5 Event No: AM ___ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/22/18 Begin Time: 5:34 End Time: 5:49

Receptor Name: Grace Valley Independent Baptist Church

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 5 Other: 1

Site Description: front of church

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):			62.7	
Traffic Count on Existing Roadway:	→	←	→	←
	___ bound	___ bound	east bound	west bound
Autos:			43	67
Medium Trucks:			1	3
Heavy Trucks:			4	6
Buses:			1	—
Motorcycles:			—	—

Distance from Existing Road: 125' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 45 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 56.5 RH 55 % Wind Speed 0.5 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.008
File Name on PC	SLM_0005625_LxT_Data_008.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-22 17:34:52
Stop	2018-10-22 17:49:55
Duration	00:15:03.3
Run Time	00:15:03.3
Pause	00:00:00.0
Pre Calibration	2018-10-22 14:45:39
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.4
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.5

Results	
LA_{Seq}	62.7
LASE	92.2
EAS	186.481
EAS8	5.946
EAS40	29.728
$LZ_{Speak\ (max)}$	2018-10-22 17:48:49

Lxt_009

NOISE RECEPTOR SITE DATA SHEET

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 5 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 7:05 End Time: 7:20

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: Grace Valley Independent Baptist Chwch

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 5 Other: 1

Site Description: front of church

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	63.5			
Traffic Count on Existing Roadway:	←			
	east bound	west bound	____ bound	____ bound
Autos:	78	52		
Medium Trucks:	2	4		
Heavy Trucks:	3	5		
Buses:	—	—		
Motorcycles:	—	—		

Distance from Existing Road: 125' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 45 - 50

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 41 RH 91 % Wind Speed 0.5 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds chirping

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.009
File Name on PC	SLM_0005625_LxT_Data_009.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 07:05:21
Stop	2018-10-23 07:20:31
Duration	00:15:09.6
Run Time	00:15:09.6
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:21
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	63.5
LASE	93.1
EAS	224.333
EAS8	7.103
EAS40	35.514
$LZ_{Speak\ (max)}$	2018-10-23 07:18:31

Lxt_010

NOISE RECEPTOR SITE DATA SHEET

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 5 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 7:20 End Time: 7:35

PM Date: ____ Begin Time: ____ End Time: ____

Receptor Name: Grace Valley Independent Baptist Church

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 5 Other: 1

Site Description: front of church

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	63.5		____	
Traffic Count on Existing Roadway: ←	east bound	west bound	____ bound	____ bound
Autos:	104	68	____	____
Medium Trucks:	2	1	____	____
Heavy Trucks:	3	4	____	____
Buses:	—	1	____	____
Motorcycles:	—	—	____	____

Distance from Existing Road: 125' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 45-50

Is the road at a grade: NO Percent Slope: ____ Which way is it inclining: ____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 41 RH 99 % Wind Speed 0.0 MPH

PM: Temp (F) ____ RH ____ % Wind Speed ____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds chirping

PM: ____

Both: ____

Summary	
File Name on Meter	LxT_Data.010
File Name on PC	SLM_0005625_LxT_Data_010.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 07:20:40
Stop	2018-10-23 07:35:56
Duration	00:15:15.9
Run Time	00:15:15.9
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	63.5
LASE	93.1
EAS	226.918
EAS8	7.135
EAS40	35.677
$LZ_{Speak\ (max)}$	2018-10-23 07:28:30

NOISE RECEPTOR SITE DATA SHEET

Lxt_011

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 4 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 7:41 End Time: 7:57

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: West KY Technology Park

Purpose of Receptors: Ambient Only (Y or N): _____ No. of Residences: 10 Other: ____

Site Description: front row of residences

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	61.5		_____	
Traffic Count on Existing Roadway: ←				
	east bound	west bound	_____ bound	_____ bound
Autos:	90	37	_____	_____
Medium Trucks:	2	4	_____	_____
Heavy Trucks:	5	5	_____	_____
Buses:	1	1	_____	_____
Motorcycles:	—	—	_____	_____

Distance from Existing Road: 100' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 35 mph Average Speed of Vehicles: 35 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: **AM:** Temp (F) 40.2° RH 96 % Wind Speed 0.0 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds chirping; dogs barking in background

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.011
File Name on PC	SLM_0005625_LxT_Data_011.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 07:41:57
Stop	2018-10-23 07:57:01
Duration	00:15:03.5
Run Time	00:15:03.5
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	61.5
LASE	91.0
EAS	141.104
EAS8	4.498
EAS40	22.489
$LZ_{Speak\ (max)}$	2018-10-23 07:53:11

Lxt_012

NOISE RECEPTOR SITE DATA SHEET

Job Name: US60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 4 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 7:57 End Time: 8:12

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: West KY Technology Park

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 10 Other: ____

Site Description: front row of residences

Intersecting Roadway Name: US60

	AM		PM	
Leq (dBA):	61.8		_____	
Traffic Count on Existing Roadway:	←			
	east bound	west bound	_____ bound	_____ bound
Autos:	73	42	_____	_____
Medium Trucks:	4	—	_____	_____
Heavy Trucks:	1	8	_____	_____
Buses:	—	—	_____	_____
Motorcycles:	—	—	_____	_____

Distance from Existing Road: 100' Height Above or Below Existing Road: 5 ft'

Existing Speed Limit: 35 mph Average Speed of Vehicles: 35 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 49° RH 84 % Wind Speed 1.0 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.012
File Name on PC	SLM_0005625_LxT_Data_012.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 07:57:12
Stop	2018-10-23 08:12:16
Duration	00:15:04.1
Run Time	00:15:04.1
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	61.8
LASE	91.4
EAS	153.687
EAS8	4.896
EAS40	24.478
$LZ_{Speak\ (max)}$	2018-10-23 08:01:11

NOISE RECEPTOR SITE DATA SHEET

Lxt_013

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 3 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 8:19 End Time: 8:35

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: Pine Lane residence

Purpose of Receptors: Ambient Only (Y or N): Y No. of Residences: 4 Other: ____

Site Description: residence near proposed alignment

Intersecting Roadway Name: Gage Road

	AM	PM
Leq (dBA):	46.4	_____

Traffic Count on Existing Roadway:

	____ bound	____ bound	____ bound	____ bound
Autos:				
Medium Trucks:				
Heavy Trucks:				
Buses:				
Motorcycles:				

Distance from Existing Road: _____ Height Above or Below Existing Road: _____

Existing Speed Limit: _____ Average Speed of Vehicles: _____

Is the road at a grade: _____ Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: NO

Weather: AM: Temp (F) 46.8 RH 89 % Wind Speed 0.0 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.013
File Name on PC	SLM_0005625_LxT_Data_013.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 08:19:53
Stop	2018-10-23 08:35:13
Duration	00:15:20.1
Run Time	00:15:20.1
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
L_{ASeq}	46.4
LASE	76.0
EAS	4.462
EAS8	139.669
EAS40	698.345
$LZ_{Speak\ (max)}$	2018-10-23 08:19:58

NOISE RECEPTOR SITE DATA SHEET

Lxt_014

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 2 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 8:48 End Time: 9:03

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: Smith's residence

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 6-7 Other: ____

Site Description: 7948 US 60 front yard

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	65.8			
Traffic Count on Existing Roadway:	←			
	east bound	west bound	____ bound	____ bound
Autos:	32	15		
Medium Trucks:	3	0		
Heavy Trucks:	3	14		
Buses:	1	—		
Motorcycles:	—	—		

Distance from Existing Road: 95' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: _____ Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 49.5° RH 86 % Wind Speed 0.0 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.014
File Name on PC	SLM_0005625_LxT_Data_014.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 08:48:54
Stop	2018-10-23 09:03:57
Duration	00:15:02.8
Run Time	00:15:02.8
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	65.8
LASE	95.3
EAS	380.697
EAS8	12.145
EAS40	60.723
$LZ_{Speak\ (max)}$	2018-10-23 08:56:23

Lxt_015

NOISE RECEPTOR SITE DATA SHEET

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 1 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 9:11 End Time: 9:26

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: House of Prayer

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 4 Other: ____

Site Description: church and picnic tables / swings

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	64.6			
Traffic Count on Existing Roadway:	←			
	east bound	west bound	____ bound	____ bound
Autos:	36	25		
Medium Trucks:	3	5		
Heavy Trucks:	5	13		
Buses:	—	—		
Motorcycles:	—	—		

Distance from Existing Road: 75' Height Above or Below Existing Road: _____

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: yes Percent Slope: _____ Which way is it inclining: west

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 51.3 RH 88 % Wind Speed 1.3 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.015
File Name on PC	SLM_0005625_LxT_Data_015.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 09:11:39
Stop	2018-10-23 09:26:47
Duration	00:15:07.8
Run Time	00:15:07.8
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	64.6
LASE	94.2
EAS	291.395
EAS8	9.245
EAS40	46.223
$LZ_{Speak\ (max)}$	2018-10-23 09:26:00

NOISE RECEPTOR SITE DATA SHEET

Lxt_016

Job Name: US 60 Job Number: 18402 Calibration Check: 113.94

Receptor Site No: 1 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 9:26 End Time: 9:42

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: House of Prayer

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 4 Other: ____

Site Description: church and picnic tables | swings

Intersecting Roadway Name: US 60

	AM		PM	
Leq (dBA):	64.9			
Traffic Count on Existing Roadway:	←			
	east bound	west bound	____ bound	____ bound
Autos:	42	14		
Medium Trucks:	2	3		
Heavy Trucks:	14	4		
Buses:	—	—		
Motorcycles:	1	—		

Distance from Existing Road: 75' Height Above or Below Existing Road: _____

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: yes Percent Slope: _____ Which way is it inclining: west

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 53.8° RH 79 % Wind Speed 1.3 MPH

PM: Temp (F) _____ RH _____% Wind Speed _____MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: birds

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.016
File Name on PC	SLM_0005625_LxT_Data_016.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 09:26:55
Stop	2018-10-23 09:42:12
Duration	00:15:16.8
Run Time	00:15:16.8
Pause	00:00:00.0
Pre Calibration	2018-10-23 07:03:18
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	64.9
LASE	94.5
EAS	313.030
EAS8	9.833
EAS40	49.167
$LZ_{Speak\ (max)}$	2018-10-23 09:29:17

NOISE RECEPTOR SITE DATA SHEET

Lxt_017

Job Name: US 60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 5 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 11:15 End Time: 11:31

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: Grace Valley Independent Baptist Church

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 5 Other: 1

Site Description: front of church

Intersecting Roadway Name: US60

	AM		PM	
Leq (dBA):	61.1			
Traffic Count on Existing Roadway: ←				
	east bound	west bound	____ bound	____ bound
Autos:	48	37		
Medium Trucks:	2	2		
Heavy Trucks:	3	6		
Buses:	—	—		
Motorcycles:	—	—		

Distance from Existing Road: 125' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 45 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 67.8 RH 43 % Wind Speed 2.5 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.017
File Name on PC	SLM_0005625_LxT_Data_017.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 11:15:03
Stop	2018-10-23 11:31:19
Duration	00:16:16.3
Run Time	00:16:16.3
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:33
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	61.1
LASE	90.9
EAS	138.269
EAS8	4.079
EAS40	20.394
$LZ_{Speak\ (max)}$	2018-10-23 11:17:37

Lxt_018

NOISE RECEPTOR SITE DATA SHEET

Job Name: US 60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 5 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 11:31 End Time: 11:48

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: Grace Valley Independent Baptist Church

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 5 Other: 1

Site Description: front of church

Intersecting Roadway Name: US 60

	AM	PM
Leq (dBA):	60.9	

Traffic Count on Existing Roadway: ←

	east bound	west bound	____ bound	____ bound
Autos:	39	50		
Medium Trucks:	5	3		
Heavy Trucks:	5	5		
Buses:	—	—		
Motorcycles:	—	—		

Distance from Existing Road: 125' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 45 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: Yes

Weather: AM: Temp (F) 71.4° RH 39 % Wind Speed 2.3 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.018
File Name on PC	SLM_0005625_LxT_Data_018.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 11:31:27
Stop	2018-10-23 11:48:50
Duration	00:17:23.7
Run Time	00:17:23.7
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	60.9
LASE	91.0
EAS	141.165
EAS8	3.895
EAS40	19.477
$LZ_{Speak\ (max)}$	2018-10-23 11:39:06

NOISE RECEPTOR SITE DATA SHEET

Lxt_019

Job Name: US60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 4 Event No: AM ✓ PM ____ Taken By: JRS

AM Date: 10/23/18 Begin Time: 11:54 End Time: 12:09

PM Date: _____ Begin Time: _____ End Time: _____

Receptor Name: West KY Technology Park

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 10 Other: ____

Site Description: front row of residences

Intersecting Roadway Name: US 60

	AM	PM
Leq (dBA):	60.0	_____

Traffic Count on Existing Roadway: ←

	east bound	west bound	_____ bound	_____ bound
Autos:	48	46	_____	_____
Medium Trucks:	2	6	_____	_____
Heavy Trucks:	6	5	_____	_____
Buses:	—	—	_____	_____
Motorcycles:	2	—	_____	_____

Distance from Existing Road: 100' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 35 mph Average Speed of Vehicles: 35 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) 68.4° RH 37 % Wind Speed 1.4 MPH

PM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: dog barking, truck idling, birds

PM: _____

Both: _____

Summary	
File Name on Meter	LxT_Data.019
File Name on PC	SLM_0005625_LxT_Data_019.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 11:54:23
Stop	2018-10-23 12:09:28
Duration	00:15:04.7
Run Time	00:15:04.7
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LASeq	60.0
LASE	89.5
EAS	99.521
EAS8	3.168
EAS40	15.841
LZSpeak (max)	2018-10-23 11:59:14

NOISE RECEPTOR SITE DATA SHEET

Lxt_020

Job Name: US 60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 4 Event No: AM ___ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/23/18 Begin Time: 12:09 End Time: 12:24

Receptor Name: West KY Technology Park

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 10 Other: ___

Site Description: front row of residences

Intersecting Roadway Name: US 60

	AM	PM
Leq (dBA):	62.8	_____

Traffic Count on Existing Roadway: ←

	east bound	west bound	_____ bound	_____ bound
Autos:	45	45	_____	_____
Medium Trucks:	2	5	_____	_____
Heavy Trucks:	6	7	_____	_____
Buses:	—	—	_____	_____
Motorcycles:	—	—	_____	_____

Distance from Existing Road: 100' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 35 mph Average Speed of Vehicles: 35 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____% Wind Speed _____MPH

PM: Temp (F) 71.5 RH 35 % Wind Speed 1.6 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: dog barking, birds

Both: _____

Summary	
File Name on Meter	LxT_Data.020
File Name on PC	SLM_0005625_LxT_Data_020.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 12:09:40
Stop	2018-10-23 12:24:43
Duration	00:15:03.2
Run Time	00:15:03.2
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	62.8
LASE	92.4
EAS	191.402
EAS8	6.103
EAS40	30.516
$LZ_{Speak\ (max)}$	2018-10-23 12:21:45

Lxt_021

NOISE RECEPTOR SITE DATA SHEET

Job Name: US60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 3 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/23/18 Begin Time: 12:35 End Time: 12:50

Receptor Name: Pine Lane residence

Purpose of Receptors: Ambient Only (Y or N): Y No. of Residences: 4 Other: ____

Site Description: residence near proposed alignment

Intersecting Roadway Name: Gage Road

	AM	PM
Leq (dBA):	_____	45.6

Traffic Count on Existing Roadway:

	____ bound	____ bound	____ bound	____ bound
Autos:				
Medium Trucks:				
Heavy Trucks:				
Buses:				
Motorcycles:				

Distance from Existing Road: _____ Height Above or Below Existing Road: _____

Existing Speed Limit: _____ Average Speed of Vehicles: _____

Is the road at a grade: _____ Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: _____

Weather: AM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

PM: Temp (F) 73.6 RH 37 % Wind Speed 1.7 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: lawn mowing in background, small plane overhead

Both: _____

Summary	
File Name on Meter	LxT_Data.021
File Name on PC	SLM_0005625_LxT_Data_021.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 12:35:36
Stop	2018-10-23 12:50:40
Duration	00:15:03.5
Run Time	00:15:03.5
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	45.6
LASE	75.2
EAS	3.683
EAS8	117.411
EAS40	587.054
$LZ_{Speak\ (max)}$	2018-10-23 12:39:33

NOISE RECEPTOR SITE DATA SHEET

Lxt_022

Job Name: US60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 2 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/23/18 Begin Time: 12:58 End Time: 1:13

Receptor Name: Smith's residence

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 6-7 Other: ____

Site Description: 7948 US60 front yard

Intersecting Roadway Name: US60

	AM		PM	
Leq (dBA):	_____		61.2	
Traffic Count on Existing Roadway:	→ _____ bound	← _____ bound	→ east bound	← west bound
Autos:	_____	_____	18	18
Medium Trucks:	_____	_____	3	3
Heavy Trucks:	_____	_____	3	4
Buses:	_____	_____	—	1
Motorcycles:	_____	_____	1	—

Distance from Existing Road: 95' Height Above or Below Existing Road: 5 ft

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: NO Percent Slope: _____ Which way is it inclining: _____

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

PM: Temp (F) 73.8 RH 38 % Wind Speed 1.1 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: birds, woodpecker

Both: _____

Summary	
File Name on Meter	LxT_Data.022
File Name on PC	SLM_0005625_LxT_Data_022.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 12:58:10
Stop	2018-10-23 13:13:53
Duration	00:15:42.7
Run Time	00:15:42.7
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	61.2
LASE	91.0
EAS	139.537
EAS8	4.263
EAS40	21.315
$LZ_{Speak\ (max)}$	2018-10-23 13:12:26

NOISE RECEPTOR SITE DATA SHEET

Lxt_023

Job Name: US60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 1 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/23/18 Begin Time: 1:21 End Time: 1:36

Receptor Name: House of Prayer

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 4 Other: 1

Site Description: church picnic tables / swings

Intersecting Roadway Name: US60

	AM		PM	
Leq (dBA):			64.0	
Traffic Count on Existing Roadway:			→	←
	____ bound	____ bound	east bound	west bound
Autos:			27	30
Medium Trucks:			5	5
Heavy Trucks:			6	10
Buses:			–	1
Motorcycles:			–	–

Distance from Existing Road: 75' Height Above or (Below) Existing Road: _____

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: yes Percent Slope: _____ Which way is it inclining: west

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

PM: Temp (F) 69.4 RH 39 % Wind Speed 2.8 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: birds, tractor on side road

Both: _____

Summary	
File Name on Meter	LxT_Data.023
File Name on PC	SLM_0005625_LxT_Data_023.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 13:21:17
Stop	2018-10-23 13:36:22
Duration	00:15:05.9
Run Time	00:15:05.9
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	64.0
LASE	93.6
EAS	253.075
EAS8	8.046
EAS40	40.228
$LZ_{Speak\ (max)}$	2018-10-23 13:23:46

Lxt_024

NOISE RECEPTOR SITE DATA SHEET

Job Name: US60 Job Number: 18402 Calibration Check: 114.02

Receptor Site No: 1 Event No: AM ____ PM ✓ Taken By: JRS

AM Date: _____ Begin Time: _____ End Time: _____

PM Date: 10/23/18 Begin Time: 1:36 End Time: 1:51

Receptor Name: House of Prayer

Purpose of Receptors: Ambient Only (Y or N): N No. of Residences: 4 Other: 1

Site Description: church picnic tables / swings

Intersecting Roadway Name: US60

	AM		PM	
Leq (dBA):			64.3	
Traffic Count on Existing Roadway:	____ bound	____ bound	→ east bound	← west bound
Autos:			28	31
Medium Trucks:			4	1
Heavy Trucks:			4	5
Buses:			—	—
Motorcycles:			—	—

Distance from Existing Road: 75' Height Above or Below (Existing) Road: _____

Existing Speed Limit: 55 mph Average Speed of Vehicles: 50 mph

Is the road at a grade: yes Percent Slope: _____ Which way is it inclining: west

Will this receptor need a driveway to the proposed road: yes

Weather: AM: Temp (F) _____ RH _____ % Wind Speed _____ MPH

PM: Temp (F) 74.8 RH 36 % Wind Speed 2.1 MPH

NOTES: Non-traffic noise (airplanes, dogs, cars on side road, etc.), foliage, terrain between road and receptor

AM: _____

PM: birds

Both: _____

Summary	
File Name on Meter	LxT_Data.024
File Name on PC	SLM_0005625_LxT_Data_024.00.ldbin
Serial Number	0005625
Model	SoundTrack LxT®
Firmware Version	2.302
User	Jim Smith
Location	Paducah
Job Description	US 60 Ballard/McCracken_Friendship Road
Note	1-24 US 60

Measurement	
Description	
Start	2018-10-23 13:36:31
Stop	2018-10-23 13:51:35
Duration	00:15:03.5
Run Time	00:15:03.5
Pause	00:00:00.0
Pre Calibration	2018-10-23 11:13:30
Post Calibration	None
Calibration Deviation	---

Overall Settings	
RMS Weight	A Weighting
Peak Weight	Z Weighting
Detector	Slow
Preamp	PRMLxT1
Microphone Correction	Off
Integration Method	Exponential
OBA Range	Low
OBA Bandwidth	1/1 and 1/3
OBA Freq. Weighting	Z Weighting
OBA Max Spectrum	Bin Max
Overload	146.5
	A
Under Range Peak	102.7
Under Range Limit	**51.7**
Noise Floor	38.6

Results	
LA_{Seq}	64.3
LASE	93.8
EAS	268.097
EAS8	8.546
EAS40	42.729
$LZ_{Speak\ (max)}$	2018-10-23 13:42:13

APPENDIX B

TRAFFIC DATA

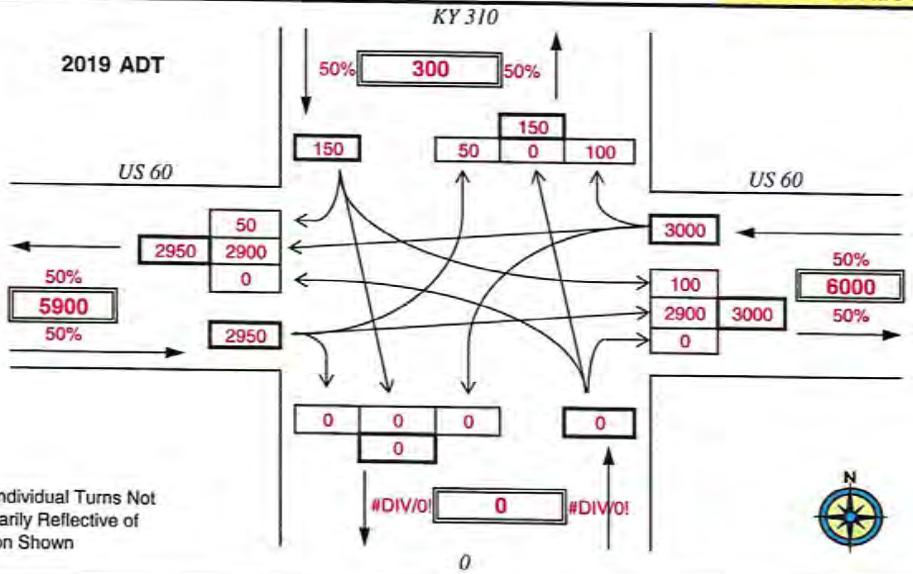
PROJECT: US 60 Ballard Count
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2019 **ADT and Design Hour Volumes**
INTERSECTION: US 60 & KY 310

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2019 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2019)

****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

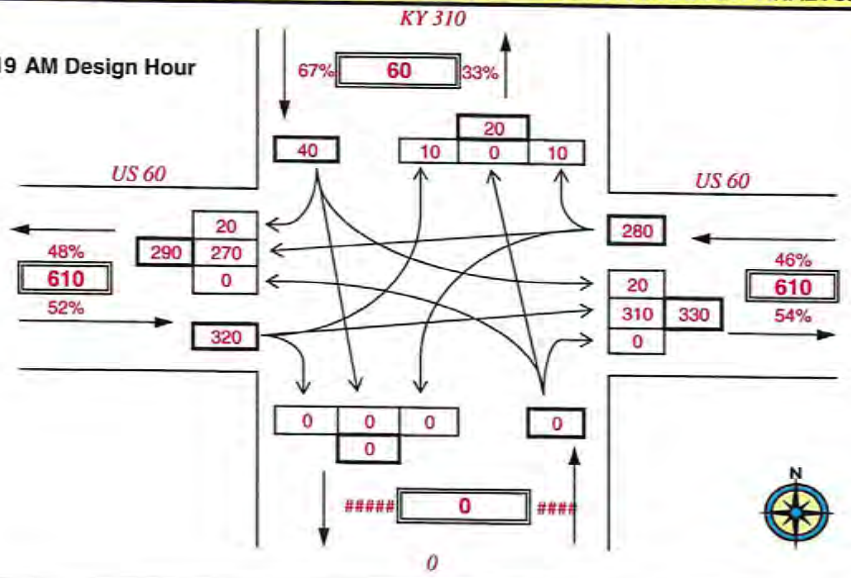
2019 ADT



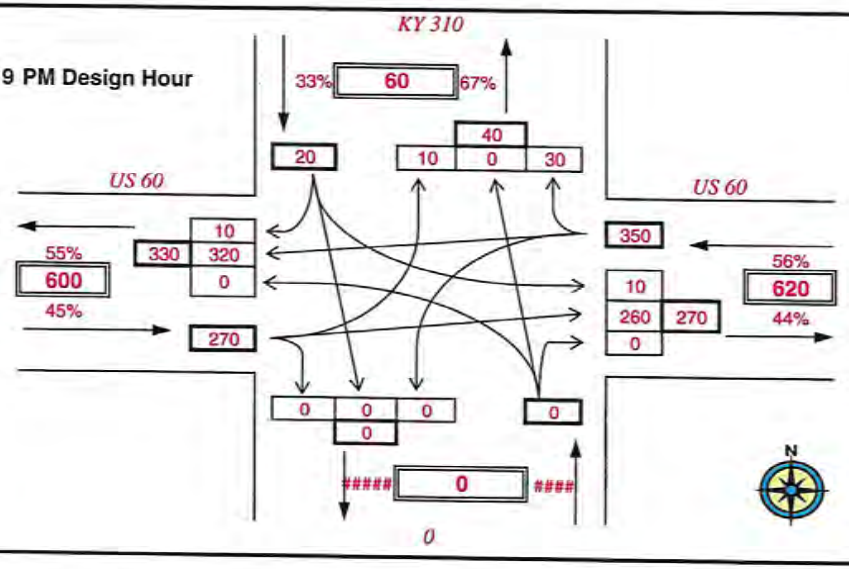
Note : Individual Turns Not Necessarily Reflective of Precision Shown

Location Map

2019 AM Design Hour



2019 PM Design Hour



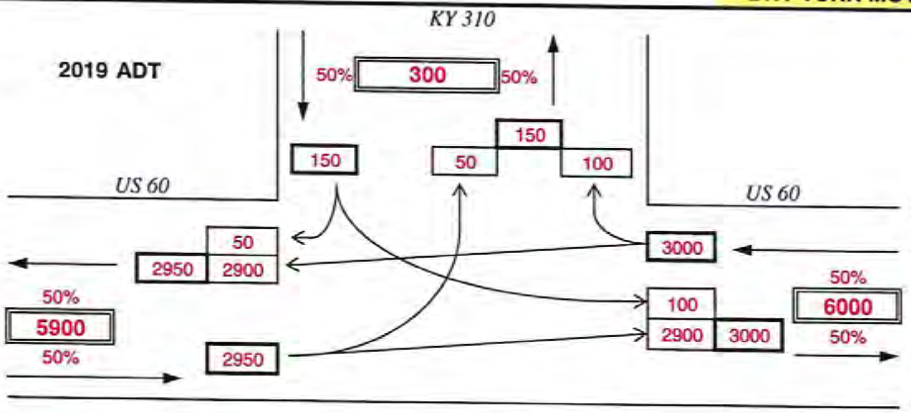
PROJECT: US 60 Ballard Count
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2019 ADT and Design Hour Volumes
INTERSECTION: US 60 & KY 310

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2019 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2019)

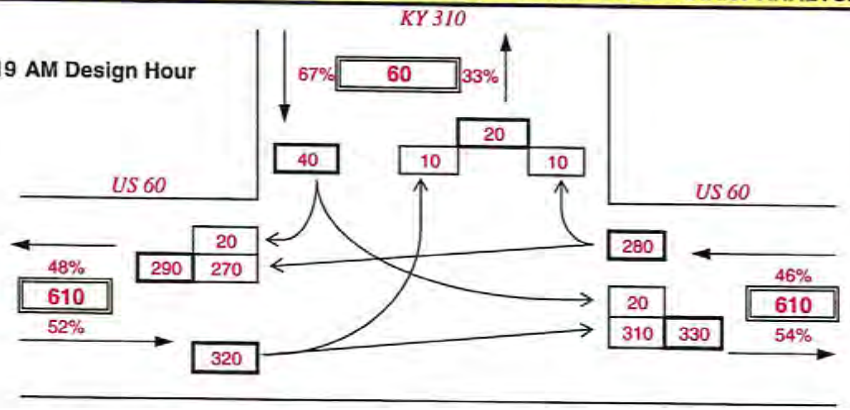
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2019 ADT



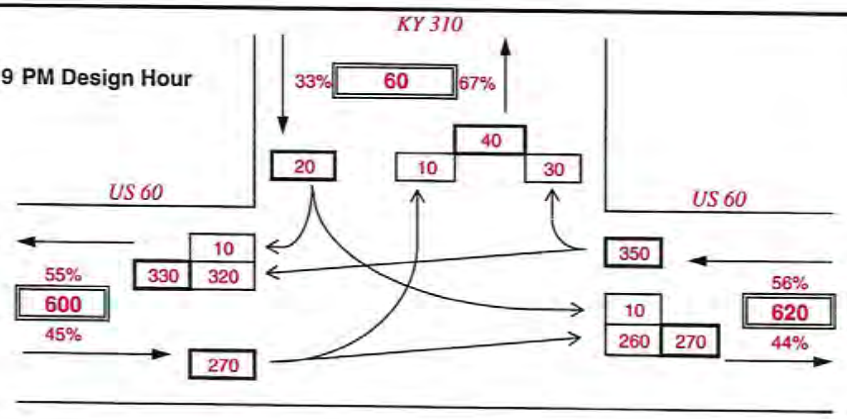
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2019 AM Design Hour



Location Map

2019 PM Design Hour



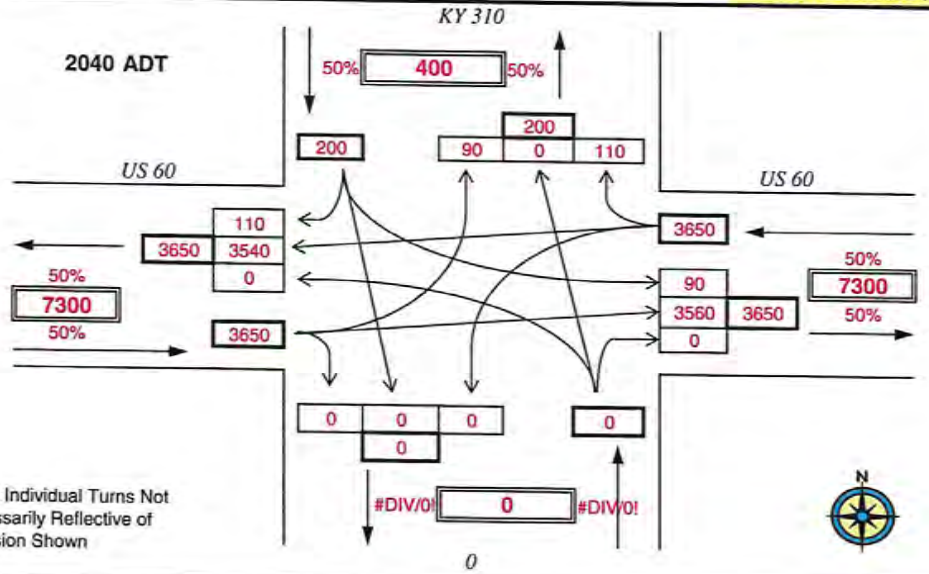
PROJECT: US 60 Ballard Count
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2040 **ADT and Design Hour Volumes**
INTERSECTION: US 60 & KY 310

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2040)

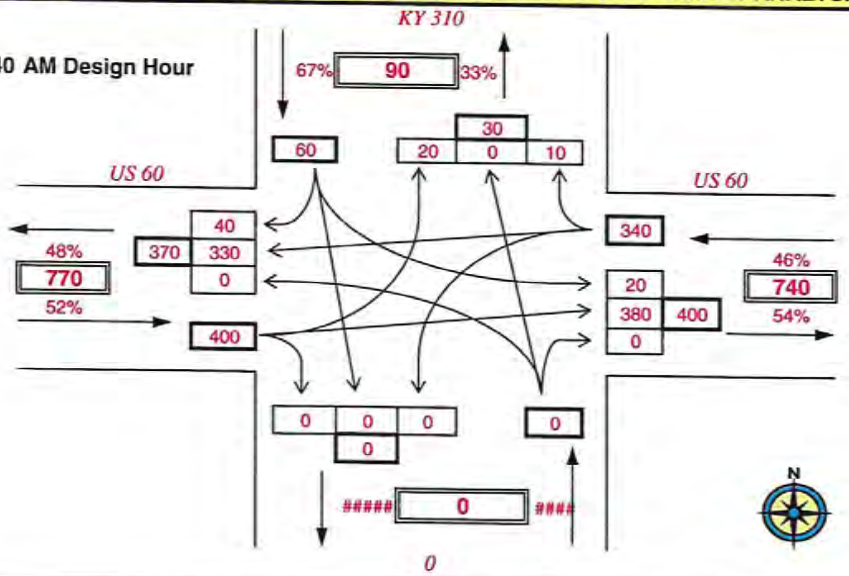
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2040 ADT



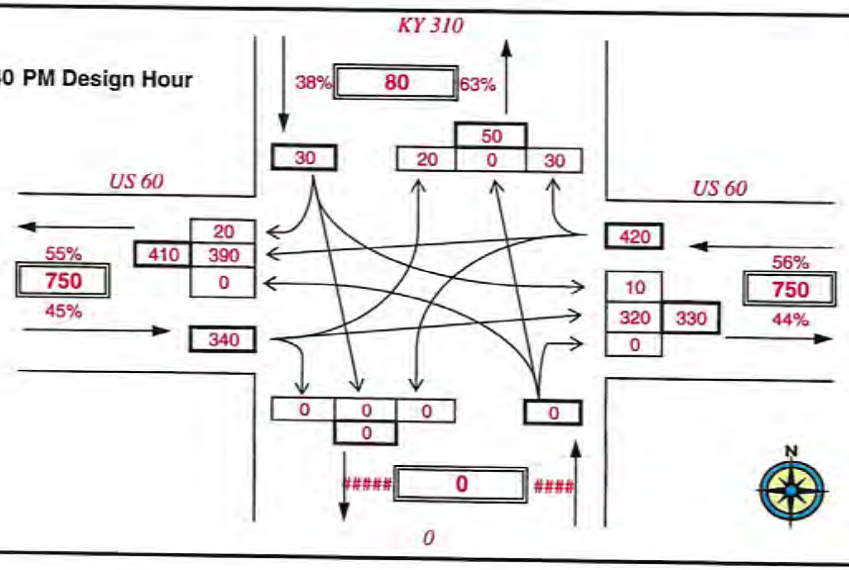
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2040 AM Design Hour



Location Map

2040 PM Design Hour



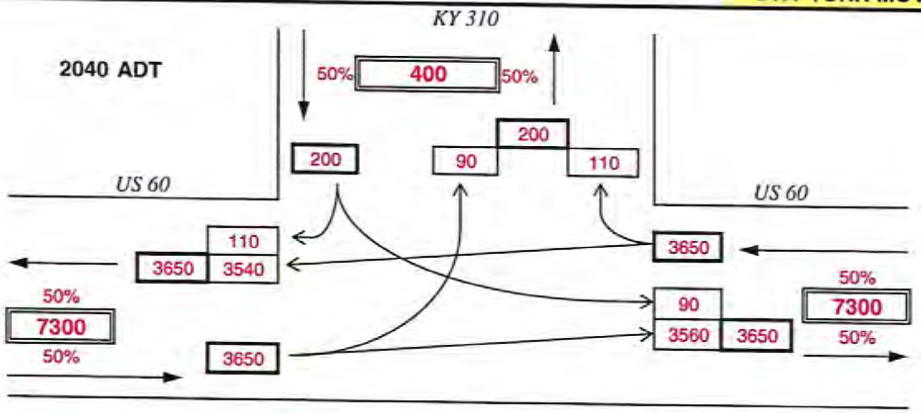
PROJECT: US 60 Ballard Count
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2040 ADT and Design Hour Volumes
INTERSECTION: US 60 & KY 310

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2040)

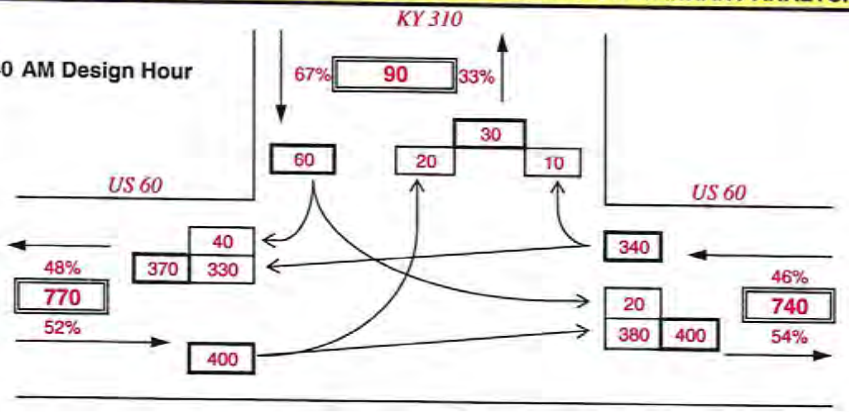
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2040 ADT



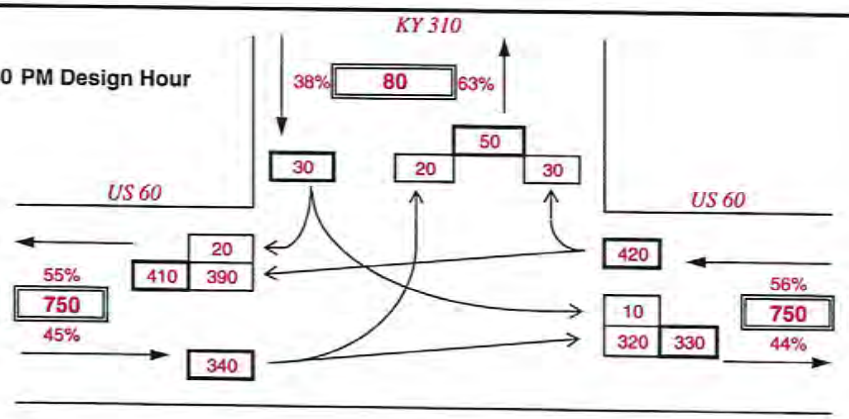
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2040 AM Design Hour



Location Map

2040 PM Design Hour



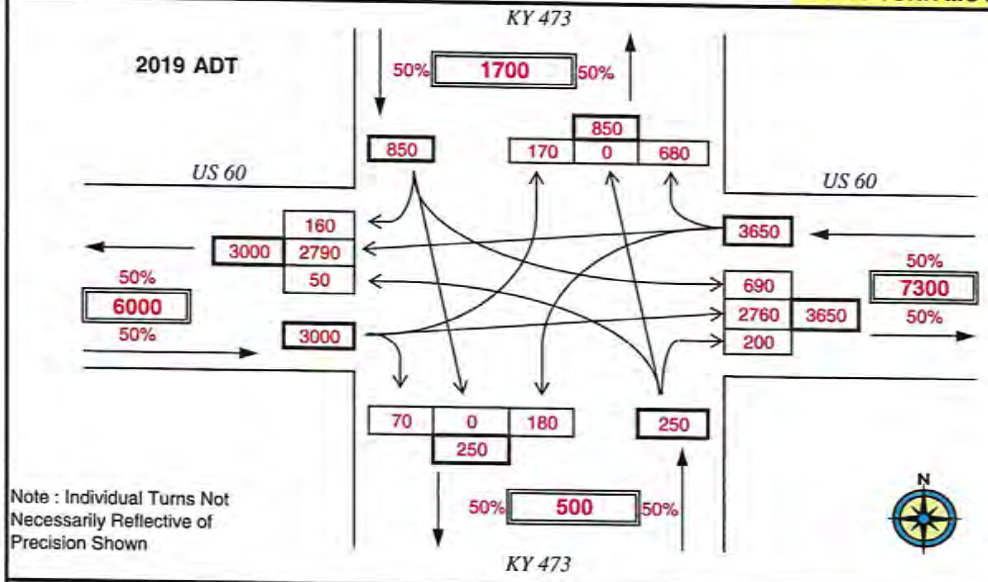
PROJECT: 0
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2019 ADT and Design Hour Volumes
INTERSECTION: US 60 & KY 473

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2019 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2019)

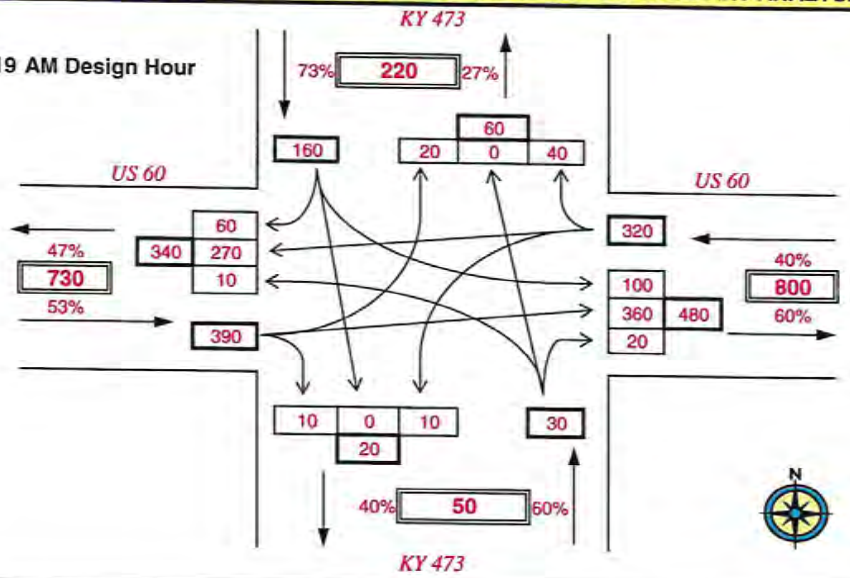
**DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS

2019 ADT



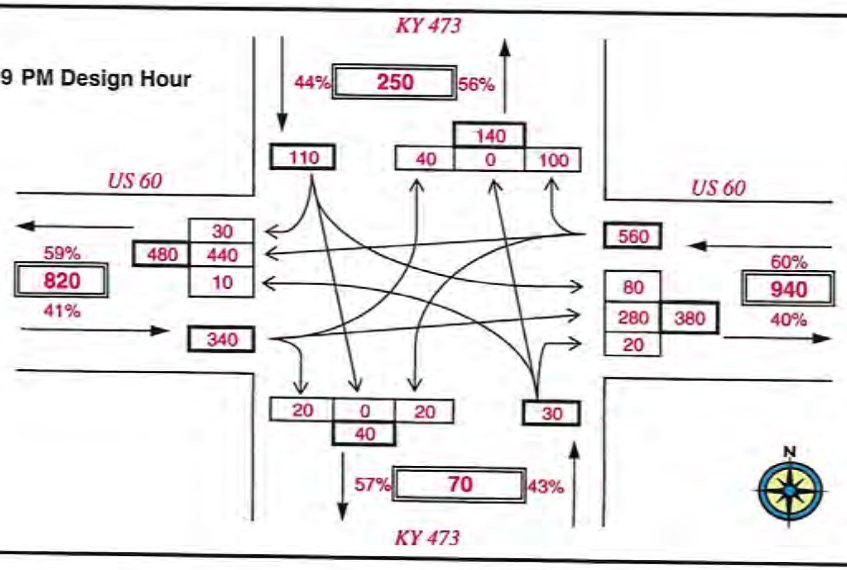
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2019 AM Design Hour



Location Map

2019 PM Design Hour



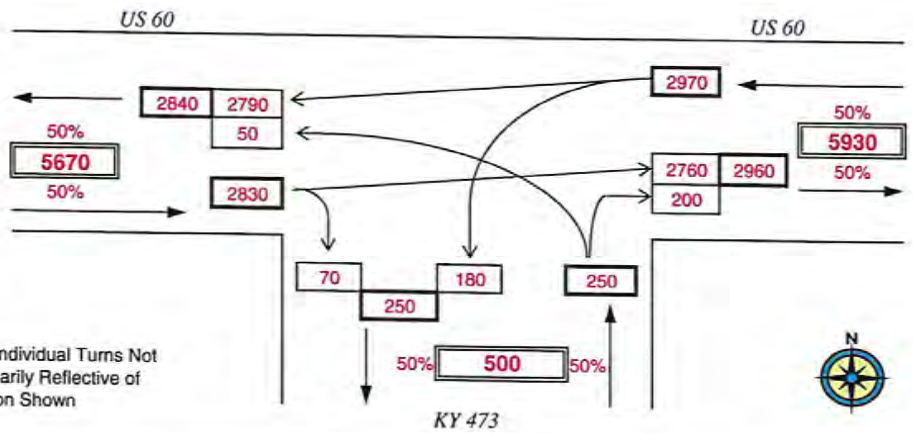
PROJECT: 0
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2019 ADT and Design Hour Volumes
INTERSECTION: US 60 & KY 473

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2019 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2019)

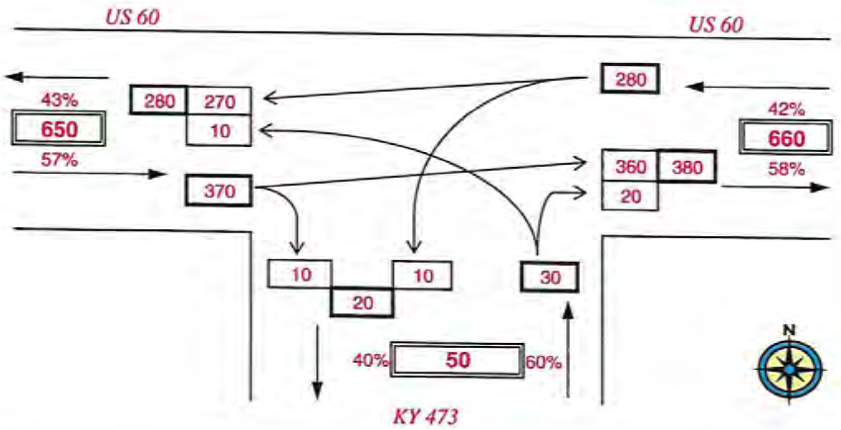
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2019 ADT



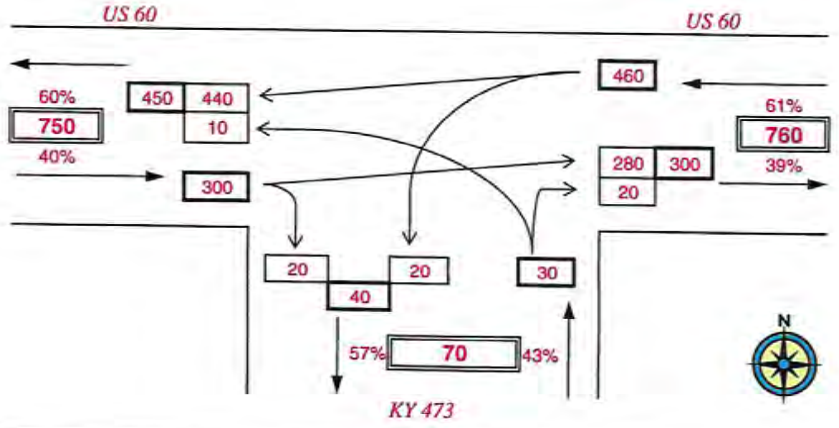
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2019 AM Design Hour



Location Map

2019 PM Design Hour



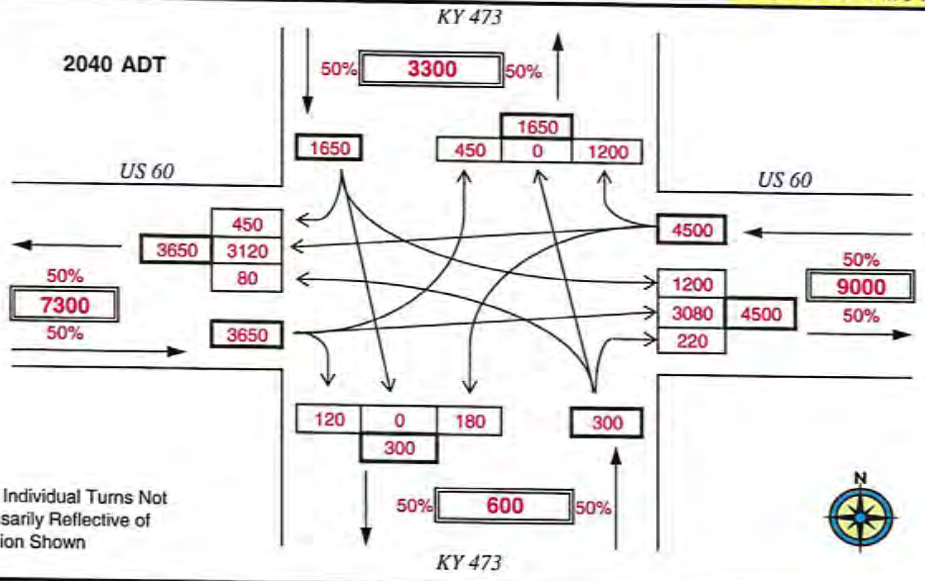
PROJECT: 0
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2040 ADT and Design Hour Volumes
INTERSECTION: US 60 & KY 473

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2040)

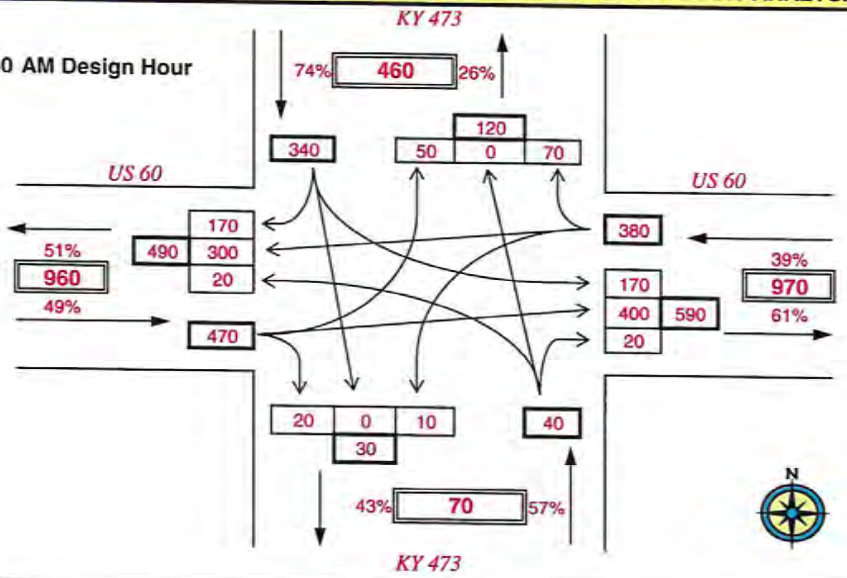
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2040 ADT



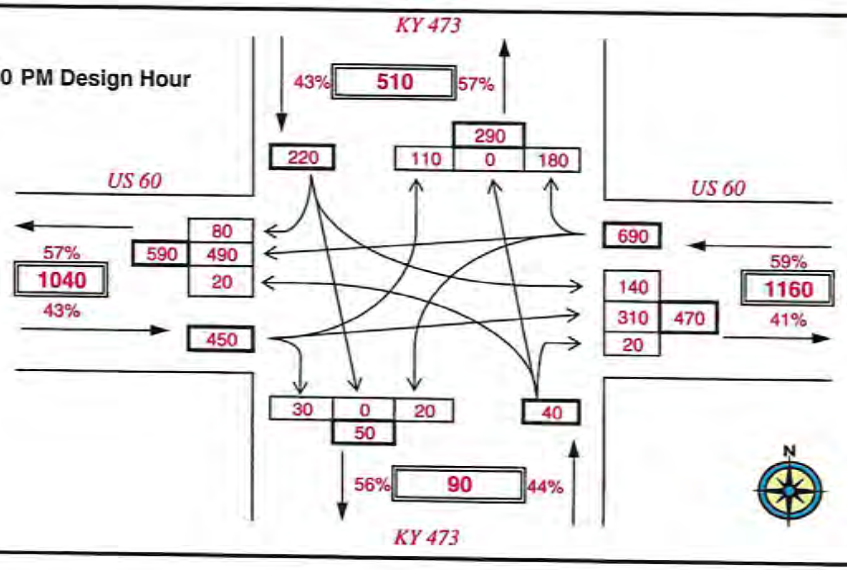
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2040 AM Design Hour



Location Map

2040 PM Design Hour



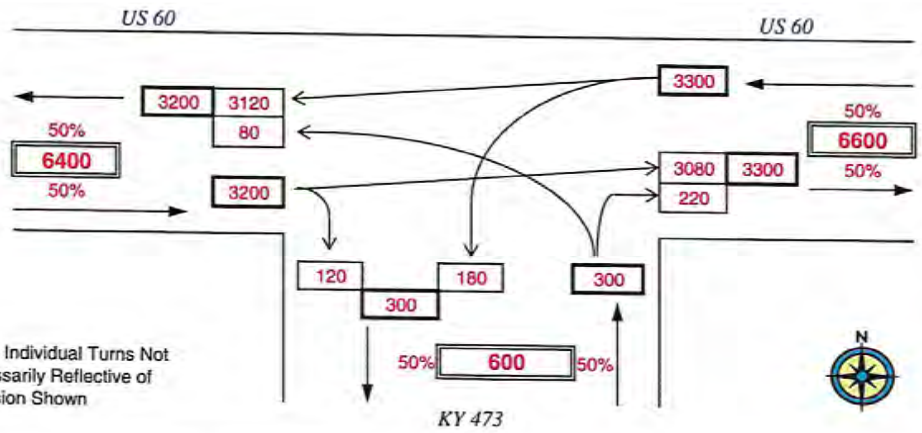
PROJECT: 0
ITEM NUMBER: 0
MARS NUMBER: 0
REQUEST DATE: Saturday, January 0, 1900
ANALYST: 0
YEAR: 2040 **ADT and Design Hour Volumes**
INTERSECTION: US 60 & KY 473

NOTE: K-Factors, Directional Distributions, and Peak Hour Factors were determined from a 2040 Turning Movement Count. AM and PM DHVs represent 30th highest hour estimates for each turn maneuver.

TURN MOVEMENT (2040)

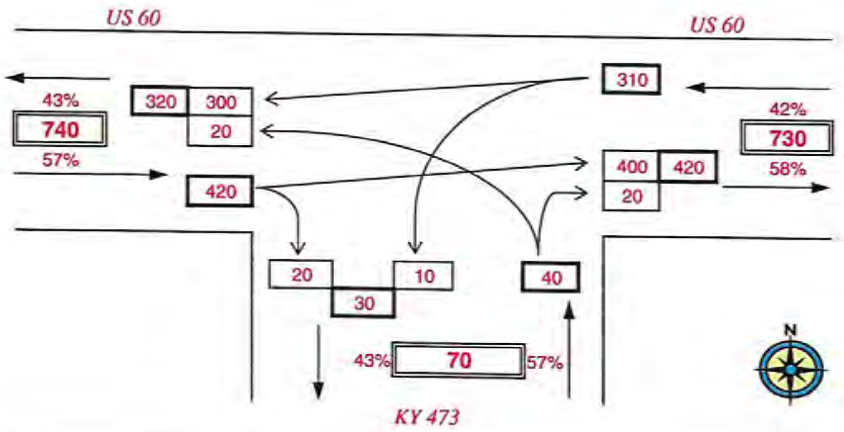
****DHV TURN MOVEMENT FORECASTS SHOULD NOT BE USED FOR SIGNAL TIMING OR WARRANT ANALYSIS**

2040 ADT



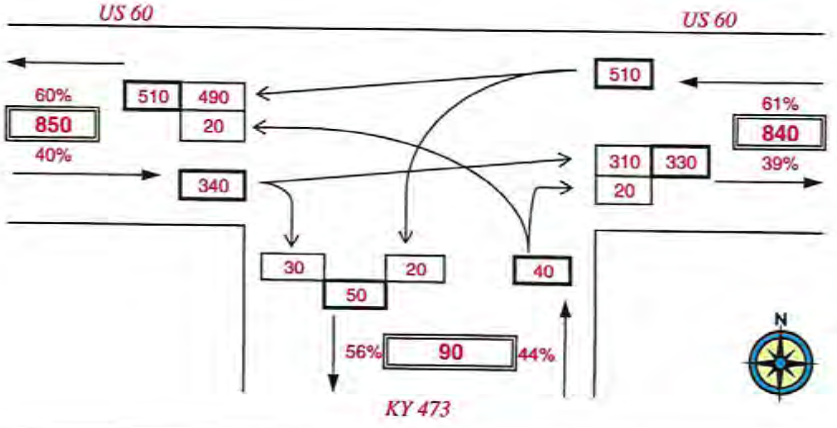
Note : Individual Turns Not Necessarily Reflective of Precision Shown

2040 AM Design Hour



Location Map

2040 PM Design Hour



APPENDIX C

EXISTING NOISE ANALYSIS

Qk4, Inc.
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18407 - US 60 Ballard Co.
RUN: Existing Conditions
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	63.5	66	63.5	10	----	63.5	0.0	7	-7.0
Receiver2	2	1	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Receiver3	3	1	0.0	63.1	66	63.1	10	----	63.1	0.0	7	-7.0
Receiver4	4	1	0.0	56.6	66	56.6	10	----	56.6	0.0	7	-7.0
Receiver5	5	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0
Receiver6	6	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver7	7	1	0.0	64.4	66	64.4	10	----	64.4	0.0	7	-7.0
Receiver8	8	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0
Receiver9	9	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver10	10	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	7	-7.0
Receiver11	11	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	7	-7.0
Receiver12	12	1	0.0	56.0	66	56.0	10	----	56.0	0.0	7	-7.0
Receiver13	13	1	0.0	62.8	66	62.8	10	----	62.8	0.0	7	-7.0
Receiver14	14	1	0.0	57.8	66	57.8	10	----	57.8	0.0	7	-7.0
Receiver16	16	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver17	17	1	0.0	56.6	66	56.6	10	----	56.6	0.0	7	-7.0
Receiver19	19	1	0.0	65.0	66	65.0	10	----	65.0	0.0	7	-7.0
Receiver21	21	1	0.0	65.9	66	65.9	10	----	65.9	0.0	7	-7.0
Receiver22	22	1	0.0	53.9	66	53.9	10	----	53.9	0.0	7	-7.0
Receiver23	23	1	0.0	67.5	66	67.5	10	Snd Lvl	67.5	0.0	7	-7.0
Receiver24	24	1	0.0	68.0	66	68.0	10	Snd Lvl	68.0	0.0	7	-7.0
Receiver25	25	1	0.0	40.4	66	40.4	10	----	40.4	0.0	7	-7.0
Receiver27	27	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0

Receiver28	28	1	0.0	64.3	66	64.3	10	----	64.3	0.0	7	-7.0
Receiver29	29	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver30	30	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver31	31	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0
Receiver32	32	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	7	-7.0
Receiver33	33	1	0.0	63.9	66	63.9	10	----	63.9	0.0	7	-7.0
Receiver34	34	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0
Receiver35	35	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0
Receiver36	36	1	0.0	64.3	66	64.3	10	----	64.3	0.0	7	-7.0
Receiver37	37	1	0.0	64.2	66	64.2	10	----	64.2	0.0	7	-7.0
Receiver38	38	1	0.0	63.1	66	63.1	10	----	63.1	0.0	7	-7.0
Receiver39	39	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver40	40	1	0.0	52.0	66	52.0	10	----	52.0	0.0	7	-7.0
Receiver42	42	1	0.0	45.9	66	45.9	10	----	45.9	0.0	7	-7.0
Receiver43	43	1	0.0	45.3	66	45.3	10	----	45.3	0.0	7	-7.0
Receiver44	44	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0
Receiver45	45	1	0.0	42.6	66	42.6	10	----	42.6	0.0	7	-7.0
Receiver47	47	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver48	48	1	0.0	42.2	66	42.2	10	----	42.2	0.0	7	-7.0
Receiver49	49	1	0.0	41.3	66	41.3	10	----	41.3	0.0	7	-7.0
Receiver50	50	1	0.0	40.8	66	40.8	10	----	40.8	0.0	7	-7.0
Receiver51	51	1	0.0	40.1	66	40.1	10	----	40.1	0.0	7	-7.0
Receiver52	52	1	0.0	39.8	66	39.8	10	----	39.8	0.0	7	-7.0
Receiver54	54	1	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0
Receiver55	55	1	0.0	62.1	66	62.1	10	----	62.1	0.0	7	-7.0
Receiver56	56	1	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	7	-7.0
Receiver57	57	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver58	58	1	0.0	53.9	66	53.9	10	----	53.9	0.0	7	-7.0
Receiver60	60	1	0.0	65.7	66	65.7	10	----	65.7	0.0	7	-7.0
Receiver61	61	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver62	62	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver63	63	1	0.0	62.4	66	62.4	10	----	62.4	0.0	7	-7.0
Receiver64	64	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	7	-7.0
Receiver65	65	1	0.0	65.2	66	65.2	10	----	65.2	0.0	7	-7.0
Receiver66	66	1	0.0	43.5	66	43.5	10	----	43.5	0.0	7	-7.0
Receiver67	67	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0
Receiver68	68	1	0.0	42.7	66	42.7	10	----	42.7	0.0	7	-7.0
Receiver69	69	1	0.0	42.3	66	42.3	10	----	42.3	0.0	7	-7.0
Receiver70	70	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver71	71	1	0.0	41.5	66	41.5	10	----	41.5	0.0	7	-7.0

Receiver72	72	1	0.0	41.8	66	41.8	10	----	41.8	0.0	7	-7.0
Receiver73	73	1	0.0	41.3	66	41.3	10	----	41.3	0.0	7	-7.0
Receiver74	74	1	0.0	40.9	66	40.9	10	----	40.9	0.0	7	-7.0
Receiver75	75	1	0.0	40.1	66	40.1	10	----	40.1	0.0	7	-7.0
Receiver77	77	1	0.0	39.7	66	39.7	10	----	39.7	0.0	7	-7.0
Receiver78	78	1	0.0	38.9	66	38.9	10	----	38.9	0.0	7	-7.0
Receiver79	79	1	0.0	38.7	66	38.7	10	----	38.7	0.0	7	-7.0
Receiver80	80	1	0.0	38.8	66	38.8	10	----	38.8	0.0	7	-7.0
Receiver82	82	1	0.0	64.8	66	64.8	10	----	64.8	0.0	7	-7.0
Receiver83	83	1	0.0	65.9	66	65.9	10	----	65.9	0.0	7	-7.0
Receiver84	84	1	0.0	63.4	66	63.4	10	----	63.4	0.0	7	-7.0
Receiver85	85	1	0.0	65.5	66	65.5	10	----	65.5	0.0	7	-7.0
Receiver86	86	1	0.0	64.8	66	64.8	10	----	64.8	0.0	7	-7.0
Receiver87	87	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver88	88	1	0.0	64.7	66	64.7	10	----	64.7	0.0	7	-7.0
Receiver89	89	1	0.0	64.7	66	64.7	10	----	64.7	0.0	7	-7.0
Receiver91	91	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver92	92	1	0.0	64.1	66	64.1	10	----	64.1	0.0	7	-7.0
Receiver93	93	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0
Receiver95	95	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver96	96	1	0.0	66.6	66	66.6	10	Snd Lvl	66.6	0.0	7	-7.0
Receiver98	98	1	0.0	43.8	66	43.8	10	----	43.8	0.0	7	-7.0
Receiver100	100	1	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0
Receiver101	101	1	0.0	55.6	66	55.6	10	----	55.6	0.0	7	-7.0
Receiver102	102	1	0.0	48.3	66	48.3	10	----	48.3	0.0	7	-7.0
Receiver103	103	1	0.0	44.6	66	44.6	10	----	44.6	0.0	7	-7.0
Receiver104	104	1	0.0	43.7	66	43.7	10	----	43.7	0.0	7	-7.0
Receiver105	105	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0
Receiver106	106	1	0.0	43.3	66	43.3	10	----	43.3	0.0	7	-7.0
Receiver107	107	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver108	108	1	0.0	60.0	66	60.0	10	----	60.0	0.0	7	-7.0
Receiver109	109	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Receiver110	110	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver111	111	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver112	112	1	0.0	59.7	66	59.7	10	----	59.7	0.0	7	-7.0
Receiver113	113	1	0.0	62.8	66	62.8	10	----	62.8	0.0	7	-7.0
Receiver114	114	1	0.0	45.3	66	45.3	10	----	45.3	0.0	7	-7.0
Receiver115	115	1	0.0	63.1	66	63.1	10	----	63.1	0.0	7	-7.0
Receiver117	117	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	7	-7.0
Receiver119	119	1	0.0	41.6	66	41.6	10	----	41.6	0.0	7	-7.0

Receiver120	120	1	0.0	41.2	66	41.2	10	----	41.2	0.0	7	-7.0
Receiver121	121	1	0.0	40.3	66	40.3	10	----	40.3	0.0	7	-7.0
Receiver122	122	1	0.0	40.0	66	40.0	10	----	40.0	0.0	7	-7.0
Receiver123	123	1	0.0	40.4	66	40.4	10	----	40.4	0.0	7	-7.0
Receiver124	124	1	0.0	41.0	66	41.0	10	----	41.0	0.0	7	-7.0
Receiver125	125	1	0.0	42.8	66	42.8	10	----	42.8	0.0	7	-7.0
Receiver126	126	1	0.0	46.2	66	46.2	10	----	46.2	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	110	0.0	0.0	0.0
All Impacted	9	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US 60 Ballard Co
RUN: Existing Site 1 9:11 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	0	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	7	-7.0
Receiver2	2	1	0.0	65.6	66	65.6	10	----	65.6	0.0	7	-7.0
Receiver3	3	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver4	4	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver5	5	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver6	6	1	0.0	62.6	66	62.6	10	----	62.6	0.0	7	-7.0
Receiver7	7	1	0.0	61.9	66	61.9	10	----	61.9	0.0	7	-7.0
House of Prayer	9	0	0.0	64.8	66	64.8	10	----	64.8	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US 60 Ballard Co
RUN: Existing Site 1 9:26 am
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	0	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	7	-7.0
Receiver2	2	1	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Receiver3	3	1	0.0	62.2	66	62.2	10	----	62.2	0.0	7	-7.0
Receiver4	4	1	0.0	62.4	66	62.4	10	----	62.4	0.0	7	-7.0
Receiver5	5	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver6	6	1	0.0	62.8	66	62.8	10	----	62.8	0.0	7	-7.0
Receiver7	7	1	0.0	61.5	66	61.5	10	----	61.5	0.0	7	-7.0
House of Prayer	9	0	0.0	64.4	66	64.4	10	----	64.4	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US 60 Ballard Co
RUN: Existing Site 1 1:21 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	0	0.0	66.9	66	66.9	10	Snd Lvl	66.9	0.0	7	-7.0
Receiver2	2	1	0.0	65.4	66	65.4	10	----	65.4	0.0	7	-7.0
Receiver3	3	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0
Receiver4	4	1	0.0	62.7	66	62.7	10	----	62.7	0.0	7	-7.0
Receiver5	5	1	0.0	62.4	66	62.4	10	----	62.4	0.0	7	-7.0
Receiver6	6	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver7	7	1	0.0	61.7	66	61.7	10	----	61.7	0.0	7	-7.0
House of Prayer	9	0	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US 60 Ballard Co
RUN: Existing Site 1 1:36 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	0	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Receiver2	2	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver3	3	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver4	4	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver5	5	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver6	6	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver7	7	1	0.0	59.6	66	59.6	10	----	59.6	0.0	7	-7.0
House of Prayer	9	0	0.0	62.6	66	62.6	10	----	62.6	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US 60 Ballard Co
RUN: Existing Site 1 3:00 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	0	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	7	-7.0
Receiver2	2	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	7	-7.0
Receiver3	3	1	0.0	64.1	66	64.1	10	----	64.1	0.0	7	-7.0
Receiver4	4	1	0.0	64.4	66	64.4	10	----	64.4	0.0	7	-7.0
Receiver5	5	1	0.0	64.3	66	64.3	10	----	64.3	0.0	7	-7.0
Receiver6	6	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver7	7	1	0.0	63.4	66	63.4	10	----	63.4	0.0	7	-7.0
House of Prayer	9	0	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	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

Qk4
JRS

8 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US 60 Ballard Co
RUN: Existing Site 1 3:15 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	0	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	7	-7.0
Receiver2	2	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0
Receiver3	3	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver4	4	1	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0
Receiver5	5	1	0.0	61.9	66	61.9	10	----	61.9	0.0	7	-7.0
Receiver6	6	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0
Receiver7	7	1	0.0	60.9	66	60.9	10	----	60.9	0.0	7	-7.0
House of Prayer	9	0	0.0	64.0	66	64.0	10	----	64.0	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	6	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co.
RUN: Existing Site 2 - 8:43 am
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Site 2 - The Smiths	11	0	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	7	-7.0
Receiver12	12	1	0.0	56.5	66	56.5	10	----	56.5	0.0	7	-7.0
Receiver13	13	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Receiver14	14	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver15	15	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver16	16	1	0.0	61.0	66	61.0	10	----	61.0	0.0	7	-7.0
Receiver17	17	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver18	18	1	0.0	49.4	66	49.4	10	----	49.4	0.0	7	-7.0
Receiver20	20	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Receiver21	21	1	0.0	59.3	66	59.3	10	----	59.3	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	9	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co.
RUN: Existing Site 2 - 12:58 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Site 2 - The Smiths	11	0	0.0	64.1	66	64.1	10	----	64.1	0.0	7	-7.0
Receiver12	12	1	0.0	54.0	66	54.0	10	----	54.0	0.0	7	-7.0
Receiver13	13	1	0.0	58.8	66	58.8	10	----	58.8	0.0	7	-7.0
Receiver14	14	1	0.0	58.3	66	58.3	10	----	58.3	0.0	7	-7.0
Receiver15	15	1	0.0	59.1	66	59.1	10	----	59.1	0.0	7	-7.0
Receiver16	16	1	0.0	58.2	66	58.2	10	----	58.2	0.0	7	-7.0
Receiver17	17	1	0.0	60.0	66	60.0	10	----	60.0	0.0	7	-7.0
Receiver18	18	1	0.0	46.4	66	46.4	10	----	46.4	0.0	7	-7.0
Receiver20	20	1	0.0	58.5	66	58.5	10	----	58.5	0.0	7	-7.0
Receiver21	21	1	0.0	56.9	66	56.9	10	----	56.9	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	9	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co.
RUN: Existing Site 2 - 3:48 pm
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Site 2 - The Smiths	11	0	0.0	66.2	66	66.2	10	Snd Lvl	66.2	0.0	7	-7.0
Receiver12	12	1	0.0	55.8	66	55.8	10	----	55.8	0.0	7	-7.0
Receiver13	13	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Receiver14	14	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver15	15	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Receiver16	16	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver17	17	1	0.0	62.1	66	62.1	10	----	62.1	0.0	7	-7.0
Receiver18	18	1	0.0	48.1	66	48.1	10	----	48.1	0.0	7	-7.0
Receiver20	20	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver21	21	1	0.0	58.9	66	58.9	10	----	58.9	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	9	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co
RUN: Existing Site 4 - 7:41 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	56.3	66	56.3	10	----	56.3	0.0	7	-7.0
Receiver2	2	1	0.0	57.0	66	57.0	10	----	57.0	0.0	7	-7.0
Receiver3	3	1	0.0	57.9	66	57.9	10	----	57.9	0.0	7	-7.0
Receiver4	4	1	0.0	57.9	66	57.9	10	----	57.9	0.0	7	-7.0
Receiver5	5	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver6	6	1	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0
Receiver7	7	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0
Receiver8	8	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver9	9	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver10	10	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0
Receiver11	11	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver12	12	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver13	13	1	0.0	60.3	66	60.3	10	----	60.3	0.0	7	-7.0
Receiver14	14	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver15	15	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0
Receiver16	16	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Site 4 - US 60 residences	19	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co
RUN: Existing Site 4 - 7:57 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	55.2	66	55.2	10	----	55.2	0.0	7	-7.0
Receiver2	2	1	0.0	55.8	66	55.8	10	----	55.8	0.0	7	-7.0
Receiver3	3	1	0.0	56.6	66	56.6	10	----	56.6	0.0	7	-7.0
Receiver4	4	1	0.0	56.6	66	56.6	10	----	56.6	0.0	7	-7.0
Receiver5	5	1	0.0	61.2	66	61.2	10	----	61.2	0.0	7	-7.0
Receiver6	6	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver7	7	1	0.0	59.5	66	59.5	10	----	59.5	0.0	7	-7.0
Receiver8	8	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver9	9	1	0.0	58.5	66	58.5	10	----	58.5	0.0	7	-7.0
Receiver10	10	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver11	11	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver12	12	1	0.0	59.5	66	59.5	10	----	59.5	0.0	7	-7.0
Receiver13	13	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver14	14	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver15	15	1	0.0	61.2	66	61.2	10	----	61.2	0.0	7	-7.0
Receiver16	16	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Site 4 - US 60 residences	19	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co
RUN: Existing Site 4 - 11:54 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	56.5	66	56.5	10	----	56.5	0.0	7	-7.0
Receiver2	2	1	0.0	57.2	66	57.2	10	----	57.2	0.0	7	-7.0
Receiver3	3	1	0.0	58.1	66	58.1	10	----	58.1	0.0	7	-7.0
Receiver4	4	1	0.0	58.2	66	58.2	10	----	58.2	0.0	7	-7.0
Receiver5	5	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver6	6	1	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0
Receiver7	7	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0
Receiver8	8	1	0.0	61.5	66	61.5	10	----	61.5	0.0	7	-7.0
Receiver9	9	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver10	10	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver11	11	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver12	12	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver13	13	1	0.0	60.3	66	60.3	10	----	60.3	0.0	7	-7.0
Receiver14	14	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver15	15	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver16	16	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0
Site 4 - US 60 residences	19	1	0.0	62.2	66	62.2	10	----	62.2	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co
RUN: Existing Site 4 - 12:09 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	56.7	66	56.7	10	----	56.7	0.0	7	-7.0
Receiver2	2	1	0.0	57.4	66	57.4	10	----	57.4	0.0	7	-7.0
Receiver3	3	1	0.0	58.3	66	58.3	10	----	58.3	0.0	7	-7.0
Receiver4	4	1	0.0	58.4	66	58.4	10	----	58.4	0.0	7	-7.0
Receiver5	5	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver6	6	1	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0
Receiver7	7	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Receiver8	8	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver9	9	1	0.0	59.6	66	59.6	10	----	59.6	0.0	7	-7.0
Receiver10	10	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0
Receiver11	11	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver12	12	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver13	13	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver14	14	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver15	15	1	0.0	62.7	66	62.7	10	----	62.7	0.0	7	-7.0
Receiver16	16	1	0.0	61.7	66	61.7	10	----	61.7	0.0	7	-7.0
Site 4 - US 60 residences	19	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co
RUN: Existing Site 4 - 4:39 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	57.8	66	57.8	10	----	57.8	0.0	7	-7.0
Receiver2	2	1	0.0	58.4	66	58.4	10	----	58.4	0.0	7	-7.0
Receiver3	3	1	0.0	59.2	66	59.2	10	----	59.2	0.0	7	-7.0
Receiver4	4	1	0.0	59.3	66	59.3	10	----	59.3	0.0	7	-7.0
Receiver5	5	1	0.0	63.9	66	63.9	10	----	63.9	0.0	7	-7.0
Receiver6	6	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver7	7	1	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0
Receiver8	8	1	0.0	62.7	66	62.7	10	----	62.7	0.0	7	-7.0
Receiver9	9	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0
Receiver10	10	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver11	11	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver12	12	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver13	13	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver14	14	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver15	15	1	0.0	64.0	66	64.0	10	----	64.0	0.0	7	-7.0
Receiver16	16	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Site 4 - US 60 residences	19	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 - US60 Ballard Co
RUN: Existing Site 4 - 4:54 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	54.8	66	54.8	10	----	54.8	0.0	7	-7.0
Receiver2	2	1	0.0	55.4	66	55.4	10	----	55.4	0.0	7	-7.0
Receiver3	3	1	0.0	56.2	66	56.2	10	----	56.2	0.0	7	-7.0
Receiver4	4	1	0.0	56.3	66	56.3	10	----	56.3	0.0	7	-7.0
Receiver5	5	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Receiver6	6	1	0.0	60.1	66	60.1	10	----	60.1	0.0	7	-7.0
Receiver7	7	1	0.0	59.1	66	59.1	10	----	59.1	0.0	7	-7.0
Receiver8	8	1	0.0	60.1	66	60.1	10	----	60.1	0.0	7	-7.0
Receiver9	9	1	0.0	58.0	66	58.0	10	----	58.0	0.0	7	-7.0
Receiver10	10	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver11	11	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver12	12	1	0.0	59.0	66	59.0	10	----	59.0	0.0	7	-7.0
Receiver13	13	1	0.0	59.0	66	59.0	10	----	59.0	0.0	7	-7.0
Receiver14	14	1	0.0	59.0	66	59.0	10	----	59.0	0.0	7	-7.0
Receiver15	15	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Receiver16	16	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Site 4 - US 60 residences	19	1	0.0	61.0	66	61.0	10	----	61.0	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max
		dB	dB	dB
All Selected	17	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US60 Ballard Co
RUN: Existing Site 5 7:05 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver2	2	1	0.0	53.5	66	53.5	10	----	53.5	0.0	7	-7.0
Receiver3	3	1	0.0	57.2	66	57.2	10	----	57.2	0.0	7	-7.0
Receiver4	4	1	0.0	57.8	66	57.8	10	----	57.8	0.0	7	-7.0
Receiver5	5	1	0.0	59.3	66	59.3	10	----	59.3	0.0	7	-7.0
Receiver6	6	1	0.0	63.4	66	63.4	10	----	63.4	0.0	7	-7.0
Receiver7	7	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver8	8	1	0.0	45.5	66	45.5	10	----	45.5	0.0	7	-7.0
Receiver9	9	1	0.0	44.1	66	44.1	10	----	44.1	0.0	7	-7.0
Receiver10	10	1	0.0	42.9	66	42.9	10	----	42.9	0.0	7	-7.0
Receiver11	11	1	0.0	40.9	66	40.9	10	----	40.9	0.0	7	-7.0
Receiver12	12	1	0.0	40.1	66	40.1	10	----	40.1	0.0	7	-7.0
Receiver13	13	1	0.0	39.4	66	39.4	10	----	39.4	0.0	7	-7.0
Receiver14	14	1	0.0	38.7	66	38.7	10	----	38.7	0.0	7	-7.0
Receiver15	15	1	0.0	43.2	66	43.2	10	----	43.2	0.0	7	-7.0
Receiver16	16	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver17	17	1	0.0	39.6	66	39.6	10	----	39.6	0.0	7	-7.0
Receiver18	18	1	0.0	38.9	66	38.9	10	----	38.9	0.0	7	-7.0
Receiver20	20	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver21	21	1	0.0	61.5	66	61.5	10	----	61.5	0.0	7	-7.0
Grace Valley Independent Church	23	0	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

		dB	dB	dB
All Selected	20	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US60 Ballard Co
RUN: Existing Site 5 7:20 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	60.3	66	60.3	10	----	60.3	0.0	7	-7.0
Receiver2	2	1	0.0	53.5	66	53.5	10	----	53.5	0.0	7	-7.0
Receiver3	3	1	0.0	57.4	66	57.4	10	----	57.4	0.0	7	-7.0
Receiver4	4	1	0.0	58.1	66	58.1	10	----	58.1	0.0	7	-7.0
Receiver5	5	1	0.0	59.7	66	59.7	10	----	59.7	0.0	7	-7.0
Receiver6	6	1	0.0	63.8	66	63.8	10	----	63.8	0.0	7	-7.0
Receiver7	7	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Receiver8	8	1	0.0	45.5	66	45.5	10	----	45.5	0.0	7	-7.0
Receiver9	9	1	0.0	44.0	66	44.0	10	----	44.0	0.0	7	-7.0
Receiver10	10	1	0.0	42.8	66	42.8	10	----	42.8	0.0	7	-7.0
Receiver11	11	1	0.0	40.9	66	40.9	10	----	40.9	0.0	7	-7.0
Receiver12	12	1	0.0	40.2	66	40.2	10	----	40.2	0.0	7	-7.0
Receiver13	13	1	0.0	39.4	66	39.4	10	----	39.4	0.0	7	-7.0
Receiver14	14	1	0.0	38.8	66	38.8	10	----	38.8	0.0	7	-7.0
Receiver15	15	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0
Receiver16	16	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver17	17	1	0.0	39.6	66	39.6	10	----	39.6	0.0	7	-7.0
Receiver18	18	1	0.0	38.9	66	38.9	10	----	38.9	0.0	7	-7.0
Receiver20	20	1	0.0	64.8	66	64.8	10	----	64.8	0.0	7	-7.0
Receiver21	21	1	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0
Grace Valley Independent Church	23	0	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max

		dB	dB	dB
All Selected	20	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US60 Ballard Co
RUN: Existing Site 5 11:15 am
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	59.5	66	59.5	10	----	59.5	0.0	7	-7.0
Receiver2	2	1	0.0	53.1	66	53.1	10	----	53.1	0.0	7	-7.0
Receiver3	3	1	0.0	56.6	66	56.6	10	----	56.6	0.0	7	-7.0
Receiver4	4	1	0.0	57.2	66	57.2	10	----	57.2	0.0	7	-7.0
Receiver5	5	1	0.0	58.5	66	58.5	10	----	58.5	0.0	7	-7.0
Receiver6	6	1	0.0	62.7	66	62.7	10	----	62.7	0.0	7	-7.0
Receiver7	7	1	0.0	59.7	66	59.7	10	----	59.7	0.0	7	-7.0
Receiver8	8	1	0.0	45.3	66	45.3	10	----	45.3	0.0	7	-7.0
Receiver9	9	1	0.0	43.8	66	43.8	10	----	43.8	0.0	7	-7.0
Receiver10	10	1	0.0	42.6	66	42.6	10	----	42.6	0.0	7	-7.0
Receiver11	11	1	0.0	40.5	66	40.5	10	----	40.5	0.0	7	-7.0
Receiver12	12	1	0.0	39.8	66	39.8	10	----	39.8	0.0	7	-7.0
Receiver13	13	1	0.0	39.0	66	39.0	10	----	39.0	0.0	7	-7.0
Receiver14	14	1	0.0	38.3	66	38.3	10	----	38.3	0.0	7	-7.0
Receiver15	15	1	0.0	42.9	66	42.9	10	----	42.9	0.0	7	-7.0
Receiver16	16	1	0.0	41.6	66	41.6	10	----	41.6	0.0	7	-7.0
Receiver17	17	1	0.0	39.2	66	39.2	10	----	39.2	0.0	7	-7.0
Receiver18	18	1	0.0	38.5	66	38.5	10	----	38.5	0.0	7	-7.0
Receiver20	20	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0
Receiver21	21	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Grace Valley Independent Church	23	0	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

		dB	dB	dB
All Selected	20	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US60 Ballard Co
RUN: Existing Site 5 11:31 am
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver2	2	1	0.0	53.7	66	53.7	10	----	53.7	0.0	7	-7.0
Receiver3	3	1	0.0	57.2	66	57.2	10	----	57.2	0.0	7	-7.0
Receiver4	4	1	0.0	57.9	66	57.9	10	----	57.9	0.0	7	-7.0
Receiver5	5	1	0.0	59.3	66	59.3	10	----	59.3	0.0	7	-7.0
Receiver6	6	1	0.0	63.5	66	63.5	10	----	63.5	0.0	7	-7.0
Receiver7	7	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver8	8	1	0.0	45.9	66	45.9	10	----	45.9	0.0	7	-7.0
Receiver9	9	1	0.0	44.5	66	44.5	10	----	44.5	0.0	7	-7.0
Receiver10	10	1	0.0	43.3	66	43.3	10	----	43.3	0.0	7	-7.0
Receiver11	11	1	0.0	41.2	66	41.2	10	----	41.2	0.0	7	-7.0
Receiver12	12	1	0.0	40.5	66	40.5	10	----	40.5	0.0	7	-7.0
Receiver13	13	1	0.0	39.7	66	39.7	10	----	39.7	0.0	7	-7.0
Receiver14	14	1	0.0	39.0	66	39.0	10	----	39.0	0.0	7	-7.0
Receiver15	15	1	0.0	43.6	66	43.6	10	----	43.6	0.0	7	-7.0
Receiver16	16	1	0.0	42.3	66	42.3	10	----	42.3	0.0	7	-7.0
Receiver17	17	1	0.0	39.9	66	39.9	10	----	39.9	0.0	7	-7.0
Receiver18	18	1	0.0	39.2	66	39.2	10	----	39.2	0.0	7	-7.0
Receiver20	20	1	0.0	64.3	66	64.3	10	----	64.3	0.0	7	-7.0
Receiver21	21	1	0.0	61.5	66	61.5	10	----	61.5	0.0	7	-7.0
Grace Valley Independent Church	23	0	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

		dB	dB	dB
All Selected	20	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US60 Ballard Co
RUN: Existing Site 5 5:19 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver2	2	1	0.0	54.5	66	54.5	10	----	54.5	0.0	7	-7.0
Receiver3	3	1	0.0	58.0	66	58.0	10	----	58.0	0.0	7	-7.0
Receiver4	4	1	0.0	58.6	66	58.6	10	----	58.6	0.0	7	-7.0
Receiver5	5	1	0.0	60.0	66	60.0	10	----	60.0	0.0	7	-7.0
Receiver6	6	1	0.0	64.4	66	64.4	10	----	64.4	0.0	7	-7.0
Receiver7	7	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver8	8	1	0.0	46.6	66	46.6	10	----	46.6	0.0	7	-7.0
Receiver9	9	1	0.0	45.2	66	45.2	10	----	45.2	0.0	7	-7.0
Receiver10	10	1	0.0	44.0	66	44.0	10	----	44.0	0.0	7	-7.0
Receiver11	11	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver12	12	1	0.0	41.3	66	41.3	10	----	41.3	0.0	7	-7.0
Receiver13	13	1	0.0	40.5	66	40.5	10	----	40.5	0.0	7	-7.0
Receiver14	14	1	0.0	39.9	66	39.9	10	----	39.9	0.0	7	-7.0
Receiver15	15	1	0.0	44.3	66	44.3	10	----	44.3	0.0	7	-7.0
Receiver16	16	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0
Receiver17	17	1	0.0	40.7	66	40.7	10	----	40.7	0.0	7	-7.0
Receiver18	18	1	0.0	40.0	66	40.0	10	----	40.0	0.0	7	-7.0
Receiver20	20	1	0.0	65.2	66	65.2	10	----	65.2	0.0	7	-7.0
Receiver21	21	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Grace Valley Independent Church	23	0	0.0	62.8	66	62.8	10	----	62.8	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

		dB	dB	dB
All Selected	20	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18402 US60 Ballard Co
RUN: Existing Site 5 5:34 pm
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h Calculated	Crit'n	Increase over existing Calculated	Crit'n Sub'l Inc	Type Impact	With Barrier Calculated LAeq1h	Noise Reduction Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver2	2	1	0.0	53.8	66	53.8	10	----	53.8	0.0	7	-7.0
Receiver3	3	1	0.0	57.2	66	57.2	10	----	57.2	0.0	7	-7.0
Receiver4	4	1	0.0	57.8	66	57.8	10	----	57.8	0.0	7	-7.0
Receiver5	5	1	0.0	59.2	66	59.2	10	----	59.2	0.0	7	-7.0
Receiver6	6	1	0.0	63.4	66	63.4	10	----	63.4	0.0	7	-7.0
Receiver7	7	1	0.0	60.3	66	60.3	10	----	60.3	0.0	7	-7.0
Receiver8	8	1	0.0	46.0	66	46.0	10	----	46.0	0.0	7	-7.0
Receiver9	9	1	0.0	44.5	66	44.5	10	----	44.5	0.0	7	-7.0
Receiver10	10	1	0.0	43.3	66	43.3	10	----	43.3	0.0	7	-7.0
Receiver11	11	1	0.0	41.2	66	41.2	10	----	41.2	0.0	7	-7.0
Receiver12	12	1	0.0	40.4	66	40.4	10	----	40.4	0.0	7	-7.0
Receiver13	13	1	0.0	39.7	66	39.7	10	----	39.7	0.0	7	-7.0
Receiver14	14	1	0.0	39.0	66	39.0	10	----	39.0	0.0	7	-7.0
Receiver15	15	1	0.0	43.6	66	43.6	10	----	43.6	0.0	7	-7.0
Receiver16	16	1	0.0	42.3	66	42.3	10	----	42.3	0.0	7	-7.0
Receiver17	17	1	0.0	39.9	66	39.9	10	----	39.9	0.0	7	-7.0
Receiver18	18	1	0.0	39.2	66	39.2	10	----	39.2	0.0	7	-7.0
Receiver20	20	1	0.0	64.4	66	64.4	10	----	64.4	0.0	7	-7.0
Receiver21	21	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Grace Valley Independent Church	23	0	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction Min	Avg	Max

		dB	dB	dB
All Selected	20	0.0	0.0	0.0
All Impacted	0	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX D

2040 NO-BUILD ANALYSIS

Qk4, Inc.
JRS

28 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18407 - US 60 Ballard Co.
RUN: 2040 No Build
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver2	2	1	0.0	65.8	66	65.8	10	----	65.8	0.0	7	-7.0
Receiver3	3	1	0.0	64.1	66	64.1	10	----	64.1	0.0	7	-7.0
Receiver4	4	1	0.0	57.6	66	57.6	10	----	57.6	0.0	7	-7.0
Receiver5	5	1	0.0	65.6	66	65.6	10	----	65.6	0.0	7	-7.0
Receiver6	6	1	0.0	64.3	66	64.3	10	----	64.3	0.0	7	-7.0
Receiver7	7	1	0.0	65.3	66	65.3	10	----	65.3	0.0	7	-7.0
Receiver8	8	1	0.0	64.6	66	64.6	10	----	64.6	0.0	7	-7.0
Receiver9	9	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	7	-7.0
Receiver10	10	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	7	-7.0
Receiver11	11	1	0.0	69.4	66	69.4	10	Snd Lvl	69.4	0.0	7	-7.0
Receiver12	12	1	0.0	56.9	66	56.9	10	----	56.9	0.0	7	-7.0
Receiver13	13	1	0.0	63.7	66	63.7	10	----	63.7	0.0	7	-7.0
Receiver14	14	1	0.0	58.6	66	58.6	10	----	58.6	0.0	7	-7.0
Receiver16	16	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver17	17	1	0.0	57.4	66	57.4	10	----	57.4	0.0	7	-7.0
Receiver19	19	1	0.0	65.9	66	65.9	10	----	65.9	0.0	7	-7.0
Receiver21	21	1	0.0	66.7	66	66.7	10	Snd Lvl	66.7	0.0	7	-7.0
Receiver22	22	1	0.0	54.8	66	54.8	10	----	54.8	0.0	7	-7.0
Receiver23	23	1	0.0	68.3	66	68.3	10	Snd Lvl	68.3	0.0	7	-7.0
Receiver24	24	1	0.0	68.8	66	68.8	10	Snd Lvl	68.8	0.0	7	-7.0
Receiver25	25	1	0.0	41.3	66	41.3	10	----	41.3	0.0	7	-7.0
Receiver27	27	1	0.0	65.4	66	65.4	10	----	65.4	0.0	7	-7.0

Receiver28	28	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver29	29	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver30	30	1	0.0	61.1	66	61.1	10	----	61.1	0.0	7	-7.0
Receiver31	31	1	0.0	65.5	66	65.5	10	----	65.5	0.0	7	-7.0
Receiver32	32	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	7	-7.0
Receiver33	33	1	0.0	64.7	66	64.7	10	----	64.7	0.0	7	-7.0
Receiver34	34	1	0.0	61.6	66	61.6	10	----	61.6	0.0	7	-7.0
Receiver35	35	1	0.0	65.5	66	65.5	10	----	65.5	0.0	7	-7.0
Receiver36	36	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver37	37	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver38	38	1	0.0	63.9	66	63.9	10	----	63.9	0.0	7	-7.0
Receiver39	39	1	0.0	63.7	66	63.7	10	----	63.7	0.0	7	-7.0
Receiver40	40	1	0.0	52.9	66	52.9	10	----	52.9	0.0	7	-7.0
Receiver42	42	1	0.0	46.8	66	46.8	10	----	46.8	0.0	7	-7.0
Receiver43	43	1	0.0	46.1	66	46.1	10	----	46.1	0.0	7	-7.0
Receiver44	44	1	0.0	44.0	66	44.0	10	----	44.0	0.0	7	-7.0
Receiver45	45	1	0.0	43.4	66	43.4	10	----	43.4	0.0	7	-7.0
Receiver47	47	1	0.0	42.8	66	42.8	10	----	42.8	0.0	7	-7.0
Receiver48	48	1	0.0	43.0	66	43.0	10	----	43.0	0.0	7	-7.0
Receiver49	49	1	0.0	42.1	66	42.1	10	----	42.1	0.0	7	-7.0
Receiver50	50	1	0.0	41.5	66	41.5	10	----	41.5	0.0	7	-7.0
Receiver51	51	1	0.0	40.8	66	40.8	10	----	40.8	0.0	7	-7.0
Receiver52	52	1	0.0	40.5	66	40.5	10	----	40.5	0.0	7	-7.0
Receiver54	54	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver55	55	1	0.0	63.1	66	63.1	10	----	63.1	0.0	7	-7.0
Receiver56	56	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	7	-7.0
Receiver57	57	1	0.0	63.8	66	63.8	10	----	63.8	0.0	7	-7.0
Receiver58	58	1	0.0	54.9	66	54.9	10	----	54.9	0.0	7	-7.0
Receiver60	60	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	7	-7.0
Receiver61	61	1	0.0	61.0	66	61.0	10	----	61.0	0.0	7	-7.0
Receiver62	62	1	0.0	61.0	66	61.0	10	----	61.0	0.0	7	-7.0
Receiver63	63	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver64	64	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	7	-7.0
Receiver65	65	1	0.0	65.6	66	65.6	10	----	65.6	0.0	7	-7.0
Receiver66	66	1	0.0	44.2	66	44.2	10	----	44.2	0.0	7	-7.0
Receiver67	67	1	0.0	43.7	66	43.7	10	----	43.7	0.0	7	-7.0
Receiver68	68	1	0.0	43.4	66	43.4	10	----	43.4	0.0	7	-7.0
Receiver69	69	1	0.0	43.0	66	43.0	10	----	43.0	0.0	7	-7.0
Receiver70	70	1	0.0	42.7	66	42.7	10	----	42.7	0.0	7	-7.0
Receiver71	71	1	0.0	42.1	66	42.1	10	----	42.1	0.0	7	-7.0

Receiver72	72	1	0.0	42.4	66	42.4	10	----	42.4	0.0	7	-7.0
Receiver73	73	1	0.0	41.9	66	41.9	10	----	41.9	0.0	7	-7.0
Receiver74	74	1	0.0	41.6	66	41.6	10	----	41.6	0.0	7	-7.0
Receiver75	75	1	0.0	40.8	66	40.8	10	----	40.8	0.0	7	-7.0
Receiver77	77	1	0.0	40.4	66	40.4	10	----	40.4	0.0	7	-7.0
Receiver78	78	1	0.0	39.6	66	39.6	10	----	39.6	0.0	7	-7.0
Receiver79	79	1	0.0	39.4	66	39.4	10	----	39.4	0.0	7	-7.0
Receiver80	80	1	0.0	39.5	66	39.5	10	----	39.5	0.0	7	-7.0
Receiver82	82	1	0.0	65.2	66	65.2	10	----	65.2	0.0	7	-7.0
Receiver83	83	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	7	-7.0
Receiver84	84	1	0.0	63.9	66	63.9	10	----	63.9	0.0	7	-7.0
Receiver85	85	1	0.0	66.0	66	66.0	10	Snd Lvl	66.0	0.0	7	-7.0
Receiver86	86	1	0.0	65.3	66	65.3	10	----	65.3	0.0	7	-7.0
Receiver87	87	1	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Receiver88	88	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver89	89	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver91	91	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver92	92	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver93	93	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver95	95	1	0.0	63.5	66	63.5	10	----	63.5	0.0	7	-7.0
Receiver96	96	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	7	-7.0
Receiver98	98	1	0.0	44.3	66	44.3	10	----	44.3	0.0	7	-7.0
Receiver100	100	1	0.0	62.2	66	62.2	10	----	62.2	0.0	7	-7.0
Receiver101	101	1	0.0	56.1	66	56.1	10	----	56.1	0.0	7	-7.0
Receiver102	102	1	0.0	48.8	66	48.8	10	----	48.8	0.0	7	-7.0
Receiver103	103	1	0.0	45.1	66	45.1	10	----	45.1	0.0	7	-7.0
Receiver104	104	1	0.0	44.2	66	44.2	10	----	44.2	0.0	7	-7.0
Receiver105	105	1	0.0	43.6	66	43.6	10	----	43.6	0.0	7	-7.0
Receiver106	106	1	0.0	43.8	66	43.8	10	----	43.8	0.0	7	-7.0
Receiver107	107	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver108	108	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver109	109	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver110	110	1	0.0	61.0	66	61.0	10	----	61.0	0.0	7	-7.0
Receiver111	111	1	0.0	65.0	66	65.0	10	----	65.0	0.0	7	-7.0
Receiver112	112	1	0.0	60.1	66	60.1	10	----	60.1	0.0	7	-7.0
Receiver113	113	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver114	114	1	0.0	45.7	66	45.7	10	----	45.7	0.0	7	-7.0
Receiver115	115	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0
Receiver117	117	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	7	-7.0
Receiver119	119	1	0.0	42.5	66	42.5	10	----	42.5	0.0	7	-7.0

Receiver120	120	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver121	121	1	0.0	41.1	66	41.1	10	----	41.1	0.0	7	-7.0
Receiver122	122	1	0.0	40.8	66	40.8	10	----	40.8	0.0	7	-7.0
Receiver123	123	1	0.0	41.2	66	41.2	10	----	41.2	0.0	7	-7.0
Receiver124	124	1	0.0	41.9	66	41.9	10	----	41.9	0.0	7	-7.0
Receiver125	125	1	0.0	43.6	66	43.6	10	----	43.6	0.0	7	-7.0
Receiver126	138	1	0.0	47.1	66	47.1	10	----	47.1	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	110	0.0	0.0	0.0
All Impacted	14	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

APPENDIX E

2040 BUILD ALTERNATIVES

Qk4, Inc.
JRS

23 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18407 - US 60 Ballard Co.
RUN: 2040 Build Alt 1
BARRIER DESIGN: INPUT HEIGHTS
ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	59.8	66	59.8	10	----	59.8	0.0	7	-7.0
Receiver2	2	1	0.0	61.2	66	61.2	10	----	61.2	0.0	7	-7.0
Receiver3	3	1	0.0	59.8	66	59.8	10	----	59.8	0.0	7	-7.0
Receiver4	4	1	0.0	54.5	66	54.5	10	----	54.5	0.0	7	-7.0
Receiver5	5	1	0.0	60.9	66	60.9	10	----	60.9	0.0	7	-7.0
Receiver6	6	1	0.0	59.6	66	59.6	10	----	59.6	0.0	7	-7.0
Receiver7	7	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0
Receiver8	8	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver9	9	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0
Receiver10	10	1	0.0	63.1	66	63.1	10	----	63.1	0.0	7	-7.0
Receiver11	11	1	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Receiver12	12	1	0.0	52.1	66	52.1	10	----	52.1	0.0	7	-7.0
Receiver13	13	1	0.0	58.7	66	58.7	10	----	58.7	0.0	7	-7.0
Receiver14	14	1	0.0	53.5	66	53.5	10	----	53.5	0.0	7	-7.0
Receiver16	16	1	0.0	56.3	66	56.3	10	----	56.3	0.0	7	-7.0
Receiver17	17	1	0.0	52.3	66	52.3	10	----	52.3	0.0	7	-7.0
Receiver19	19	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver21	21	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0
Receiver22	22	1	0.0	50.8	66	50.8	10	----	50.8	0.0	7	-7.0
Receiver23	23	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0
Receiver24	24	1	0.0	64.0	66	64.0	10	----	64.0	0.0	7	-7.0
Receiver25	25	1	0.0	47.4	66	47.4	10	----	47.4	0.0	7	-7.0
Receiver27	27	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0

Receiver28	28	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver29	29	1	0.0	58.6	66	58.6	10	----	58.6	0.0	7	-7.0
Receiver30	30	1	0.0	57.1	66	57.1	10	----	57.1	0.0	7	-7.0
Receiver31	31	1	0.0	61.3	66	61.3	10	----	61.3	0.0	7	-7.0
Receiver32	32	1	0.0	63.1	66	63.1	10	----	63.1	0.0	7	-7.0
Receiver33	33	1	0.0	61.8	66	61.8	10	----	61.8	0.0	7	-7.0
Receiver34	34	1	0.0	58.2	66	58.2	10	----	58.2	0.0	7	-7.0
Receiver35	35	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0
Receiver36	36	1	0.0	62.3	66	62.3	10	----	62.3	0.0	7	-7.0
Receiver37	37	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver38	38	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver39	39	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver40	40	1	0.0	54.6	66	54.6	10	----	54.6	0.0	7	-7.0
Receiver42	42	1	0.0	57.1	66	57.1	10	----	57.1	0.0	7	-7.0
Receiver43	43	1	0.0	48.4	66	48.4	10	----	48.4	0.0	7	-7.0
Receiver44	44	1	0.0	45.9	66	45.9	10	----	45.9	0.0	7	-7.0
Receiver45	45	1	0.0	53.3	66	53.3	10	----	53.3	0.0	7	-7.0
Receiver47	47	1	0.0	48.0	66	48.0	10	----	48.0	0.0	7	-7.0
Receiver48	48	1	0.0	47.8	66	47.8	10	----	47.8	0.0	7	-7.0
Receiver49	49	1	0.0	51.9	66	51.9	10	----	51.9	0.0	7	-7.0
Receiver50	50	1	0.0	58.2	66	58.2	10	----	58.2	0.0	7	-7.0
Receiver51	51	1	0.0	66.5	66	66.5	10	Snd Lvl	66.5	0.0	7	-7.0
Receiver52	52	1	0.0	58.6	66	58.6	10	----	58.6	0.0	7	-7.0
Receiver54	54	1	0.0	56.7	66	56.7	10	----	56.7	0.0	7	-7.0
Receiver55	55	1	0.0	56.8	66	56.8	10	----	56.8	0.0	7	-7.0
Receiver56	56	1	0.0	61.5	66	61.5	10	----	61.5	0.0	7	-7.0
Receiver57	57	1	0.0	57.7	66	57.7	10	----	57.7	0.0	7	-7.0
Receiver58	58	1	0.0	49.0	66	49.0	10	----	49.0	0.0	7	-7.0
Receiver60	60	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver61	61	1	0.0	54.7	66	54.7	10	----	54.7	0.0	7	-7.0
Receiver62	62	1	0.0	54.4	66	54.4	10	----	54.4	0.0	7	-7.0
Receiver63	63	1	0.0	55.9	66	55.9	10	----	55.9	0.0	7	-7.0
Receiver64	64	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver65	65	1	0.0	58.3	66	58.3	10	----	58.3	0.0	7	-7.0
Receiver66	66	1	0.0	47.6	66	47.6	10	----	47.6	0.0	7	-7.0
Receiver67	67	1	0.0	49.2	66	49.2	10	----	49.2	0.0	7	-7.0
Receiver68	68	1	0.0	49.5	66	49.5	10	----	49.5	0.0	7	-7.0
Receiver69	69	1	0.0	51.7	66	51.7	10	----	51.7	0.0	7	-7.0
Receiver70	70	1	0.0	51.9	66	51.9	10	----	51.9	0.0	7	-7.0
Receiver71	71	1	0.0	55.6	66	55.6	10	----	55.6	0.0	7	-7.0

Receiver72	72	1	0.0	54.7	66	54.7	10	----	54.7	0.0	7	-7.0
Receiver73	73	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver74	74	1	0.0	63.2	66	63.2	10	----	63.2	0.0	7	-7.0
Receiver75	75	1	0.0	59.1	66	59.1	10	----	59.1	0.0	7	-7.0
Receiver77	77	1	0.0	53.7	66	53.7	10	----	53.7	0.0	7	-7.0
Receiver78	78	1	0.0	47.6	66	47.6	10	----	47.6	0.0	7	-7.0
Receiver79	79	1	0.0	46.3	66	46.3	10	----	46.3	0.0	7	-7.0
Receiver80	80	1	0.0	47.0	66	47.0	10	----	47.0	0.0	7	-7.0
Receiver82	82	1	0.0	57.2	66	57.2	10	----	57.2	0.0	7	-7.0
Receiver83	83	1	0.0	58.1	66	58.1	10	----	58.1	0.0	7	-7.0
Receiver84	84	1	0.0	55.8	66	55.8	10	----	55.8	0.0	7	-7.0
Receiver85	85	1	0.0	57.7	66	57.7	10	----	57.7	0.0	7	-7.0
Receiver86	86	1	0.0	57.0	66	57.0	10	----	57.0	0.0	7	-7.0
Receiver87	87	1	0.0	56.6	66	56.6	10	----	56.6	0.0	7	-7.0
Receiver88	88	1	0.0	56.8	66	56.8	10	----	56.8	0.0	7	-7.0
Receiver89	89	1	0.0	56.9	66	56.9	10	----	56.9	0.0	7	-7.0
Receiver91	91	1	0.0	55.4	66	55.4	10	----	55.4	0.0	7	-7.0
Receiver92	92	1	0.0	56.5	66	56.5	10	----	56.5	0.0	7	-7.0
Receiver93	93	1	0.0	56.8	66	56.8	10	----	56.8	0.0	7	-7.0
Receiver95	95	1	0.0	56.1	66	56.1	10	----	56.1	0.0	7	-7.0
Receiver96	96	1	0.0	59.4	66	59.4	10	----	59.4	0.0	7	-7.0
Receiver98	98	1	0.0	74.0	66	74.0	10	Snd Lvl	74.0	0.0	7	-7.0
Receiver100	100	1	0.0	55.9	66	55.9	10	----	55.9	0.0	7	-7.0
Receiver101	101	1	0.0	53.7	66	53.7	10	----	53.7	0.0	1	-7.0
Receiver102	102	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver103	103	1	0.0	62.4	66	62.4	10	----	62.4	0.0	7	-7.0
Receiver104	104	1	0.0	57.3	66	57.3	10	----	57.3	0.0	7	-7.0
Receiver105	105	1	0.0	54.7	66	54.7	10	----	54.7	0.0	7	-7.0
Receiver106	106	1	0.0	54.8	66	54.8	10	----	54.8	0.0	7	-7.0
Receiver107	107	1	0.0	56.1	66	56.1	10	----	56.1	0.0	7	-7.0
Receiver108	108	1	0.0	56.1	66	56.1	10	----	56.1	0.0	7	-7.0
Receiver109	109	1	0.0	56.7	66	56.7	10	----	56.7	0.0	7	-7.0
Receiver110	110	1	0.0	56.5	66	56.5	10	----	56.5	0.0	7	-7.0
Receiver111	111	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver112	112	1	0.0	58.0	66	58.0	10	----	58.0	0.0	7	-7.0
Receiver113	113	1	0.0	59.5	66	59.5	10	----	59.5	0.0	7	-7.0
Receiver114	114	1	0.0	54.6	66	54.6	10	----	54.6	0.0	7	-7.0
Receiver115	115	1	0.0	58.7	66	58.7	10	----	58.7	0.0	7	-7.0
Receiver117	117	1	0.0	61.4	66	61.4	10	----	61.4	0.0	7	-7.0
Receiver119	119	1	0.0	40.2	66	40.2	10	----	40.2	0.0	7	-7.0

Receiver120	120	1	0.0	40.3	66	40.3	10	----	40.3	0.0	7	-7.0
Receiver121	121	1	0.0	40.1	66	40.1	10	----	40.1	0.0	7	-7.0
Receiver122	122	1	0.0	38.9	66	38.9	10	----	38.9	0.0	7	-7.0
Receiver123	123	1	0.0	39.3	66	39.3	10	----	39.3	0.0	7	-7.0
Receiver124	124	1	0.0	39.8	66	39.8	10	----	39.8	0.0	7	-7.0
Receiver125	125	1	0.0	40.8	66	40.8	10	----	40.8	0.0	7	-7.0
Receiver126	126	1	0.0	43.2	66	43.2	10	----	43.2	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	110	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

Qk4, Inc.
JRS

23 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18407 - US 60 Ballard Co.
RUN: 2040 Build Alt 2
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	64.3	66	64.3	10	----	64.3	0.0	7	-7.0
Receiver2	2	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	7	-7.0
Receiver3	3	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	7	-7.0
Receiver4	4	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver5	5	1	0.0	65.6	66	65.6	10	----	65.6	0.0	7	-7.0
Receiver6	6	1	0.0	64.5	66	64.5	10	----	64.5	0.0	7	-7.0
Receiver7	7	1	0.0	65.3	66	65.3	10	----	65.3	0.0	7	-7.0
Receiver8	8	1	0.0	64.7	66	64.7	10	----	64.7	0.0	7	-7.0
Receiver9	9	1	0.0	72.4	66	72.4	10	Snd Lvl	72.4	0.0	7	-7.0
Receiver10	10	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	7	-7.0
Receiver11	11	1	0.0	68.6	66	68.6	10	Snd Lvl	68.6	0.0	7	-7.0
Receiver12	12	1	0.0	59.2	66	59.2	10	----	59.2	0.0	7	-7.0
Receiver13	13	1	0.0	67.9	66	67.9	10	Snd Lvl	67.9	0.0	7	-7.0
Receiver14	14	1	0.0	58.9	66	58.9	10	----	58.9	0.0	7	-7.0
Receiver16	16	1	0.0	61.7	66	61.7	10	----	61.7	0.0	7	-7.0
Receiver17	17	1	0.0	59.2	66	59.2	10	----	59.2	0.0	7	-7.0
Receiver19	19	1	0.0	71.1	66	71.1	10	Snd Lvl	71.1	0.0	7	-7.0
Receiver21	21	1	0.0	74.1	66	74.1	10	Snd Lvl	74.1	0.0	7	-7.0
Receiver22	22	1	0.0	55.7	66	55.7	10	----	55.7	0.0	7	-7.0
Receiver23	23	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver24	24	1	0.0	64.9	66	64.9	10	----	64.9	0.0	7	-7.0
Receiver25	25	1	0.0	41.9	66	41.9	10	----	41.9	0.0	7	-7.0
Receiver27	27	1	0.0	63.4	66	63.4	10	----	63.4	0.0	7	-7.0

Receiver28	28	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0
Receiver29	29	1	0.0	66.4	66	66.4	10	Snd Lvl	66.4	0.0	7	-7.0
Receiver30	30	1	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0
Receiver31	31	1	0.0	64.7	66	64.7	10	----	64.7	0.0	7	-7.0
Receiver32	32	1	0.0	75.4	66	75.4	10	Snd Lvl	75.4	0.0	7	-7.0
Receiver33	33	1	0.0	69.1	66	69.1	10	Snd Lvl	69.1	0.0	7	-7.0
Receiver34	34	1	0.0	60.8	66	60.8	10	----	60.8	0.0	7	-7.0
Receiver35	35	1	0.0	63.7	66	63.7	10	----	63.7	0.0	7	-7.0
Receiver36	36	1	0.0	63.5	66	63.5	10	----	63.5	0.0	7	-7.0
Receiver37	37	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver38	38	1	0.0	62.4	66	62.4	10	----	62.4	0.0	7	-7.0
Receiver39	39	1	0.0	62.8	66	62.8	10	----	62.8	0.0	7	-7.0
Receiver40	40	1	0.0	56.4	66	56.4	10	----	56.4	0.0	7	-7.0
Receiver42	42	1	0.0	48.2	66	48.2	10	----	48.2	0.0	7	-7.0
Receiver43	43	1	0.0	47.6	66	47.6	10	----	47.6	0.0	7	-7.0
Receiver44	44	1	0.0	45.1	66	45.1	10	----	45.1	0.0	7	-7.0
Receiver45	45	1	0.0	44.7	66	44.7	10	----	44.7	0.0	7	-7.0
Receiver47	47	1	0.0	43.3	66	43.3	10	----	43.3	0.0	7	-7.0
Receiver48	48	1	0.0	43.3	66	43.3	10	----	43.3	0.0	7	-7.0
Receiver49	49	1	0.0	42.4	66	42.4	10	----	42.4	0.0	7	-7.0
Receiver50	50	1	0.0	41.8	66	41.8	10	----	41.8	0.0	7	-7.0
Receiver51	51	1	0.0	41.1	66	41.1	10	----	41.1	0.0	7	-7.0
Receiver52	52	1	0.0	40.7	66	40.7	10	----	40.7	0.0	7	-7.0
Receiver54	54	1	0.0	73.2	66	73.2	10	Snd Lvl	73.2	0.0	7	-7.0
Receiver55	55	1	0.0	72.8	66	72.8	10	Snd Lvl	72.8	0.0	7	-7.0
Receiver56	56	1	0.0	66.1	66	66.1	10	Snd Lvl	66.1	0.0	7	-7.0
Receiver57	57	1	0.0	61.7	66	61.7	10	----	61.7	0.0	7	-7.0
Receiver58	58	1	0.0	57.9	66	57.9	10	----	57.9	0.0	7	-7.0
Receiver60	60	1	0.0	67.7	66	67.7	10	Snd Lvl	67.7	0.0	7	-7.0
Receiver61	61	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver62	62	1	0.0	60.7	66	60.7	10	----	60.7	0.0	7	-7.0
Receiver63	63	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver64	64	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	7	-7.0
Receiver65	65	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	7	-7.0
Receiver66	66	1	0.0	44.4	66	44.4	10	----	44.4	0.0	7	-7.0
Receiver67	67	1	0.0	43.9	66	43.9	10	----	43.9	0.0	7	-7.0
Receiver68	68	1	0.0	43.6	66	43.6	10	----	43.6	0.0	7	-7.0
Receiver69	69	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0
Receiver70	70	1	0.0	42.8	66	42.8	10	----	42.8	0.0	7	-7.0
Receiver71	71	1	0.0	40.7	66	40.7	10	----	40.7	0.0	7	-7.0

Receiver72	72	1	0.0	42.5	66	42.5	10	----	42.5	0.0	7	-7.0
Receiver73	73	1	0.0	42.0	66	42.0	10	----	42.0	0.0	7	-7.0
Receiver74	74	1	0.0	41.7	66	41.7	10	----	41.7	0.0	7	-7.0
Receiver75	75	1	0.0	40.9	66	40.9	10	----	40.9	0.0	7	-7.0
Receiver77	77	1	0.0	40.4	66	40.4	10	----	40.4	0.0	7	-7.0
Receiver78	78	1	0.0	39.6	66	39.6	10	----	39.6	0.0	7	-7.0
Receiver79	79	1	0.0	39.4	66	39.4	10	----	39.4	0.0	7	-7.0
Receiver80	80	1	0.0	39.5	66	39.5	10	----	39.5	0.0	7	-7.0
Receiver82	82	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	7	-7.0
Receiver83	83	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	7	-7.0
Receiver84	84	1	0.0	65.5	66	65.5	10	----	65.5	0.0	7	-7.0
Receiver85	85	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	7	-7.0
Receiver86	86	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	7	-7.0
Receiver87	87	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	7	-7.0
Receiver88	88	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	7	-7.0
Receiver89	89	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	7	-7.0
Receiver91	91	1	0.0	62.0	66	62.0	10	----	62.0	0.0	7	-7.0
Receiver92	92	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver93	93	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver95	95	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver96	96	1	0.0	67.3	66	67.3	10	Snd Lvl	67.3	0.0	7	-7.0
Receiver98	98	1	0.0	45.0	66	45.0	10	----	45.0	0.0	7	-7.0
Receiver100	100	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver101	101	1	0.0	56.2	66	56.2	10	----	56.2	0.0	7	-7.0
Receiver102	102	1	0.0	49.3	66	49.3	10	----	49.3	0.0	7	-7.0
Receiver103	103	1	0.0	45.6	66	45.6	10	----	45.6	0.0	7	-7.0
Receiver104	104	1	0.0	44.7	66	44.7	10	----	44.7	0.0	7	-7.0
Receiver105	105	1	0.0	43.9	66	43.9	10	----	43.9	0.0	7	-7.0
Receiver106	106	1	0.0	44.1	66	44.1	10	----	44.1	0.0	7	-7.0
Receiver107	107	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver108	108	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver109	109	1	0.0	60.9	66	60.9	10	----	60.9	0.0	7	-7.0
Receiver110	110	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver111	111	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver112	112	1	0.0	58.7	66	58.7	10	----	58.7	0.0	7	-7.0
Receiver113	120	1	0.0	55.0	66	55.0	10	----	55.0	0.0	7	-7.0
Receiver114	121	1	0.0	42.9	66	42.9	10	----	42.9	0.0	7	-7.0
Receiver115	122	1	0.0	45.6	66	45.6	10	----	45.6	0.0	7	-7.0
Receiver117	123	1	0.0	37.4	66	37.4	10	----	37.4	0.0	7	-7.0
Receiver119	124	1	0.0	43.1	66	43.1	10	----	43.1	0.0	7	-7.0

Receiver120	125	1	0.0	43.4	66	43.4	10	----	43.4	0.0	7	-7.0
Receiver121	126	1	0.0	42.3	66	42.3	10	----	42.3	0.0	7	-7.0
Receiver122	127	1	0.0	41.0	66	41.0	10	----	41.0	0.0	7	-7.0
Receiver123	128	1	0.0	41.3	66	41.3	10	----	41.3	0.0	7	-7.0
Receiver124	129	1	0.0	42.1	66	42.1	10	----	42.1	0.0	7	-7.0
Receiver125	130	1	0.0	44.1	66	44.1	10	----	44.1	0.0	7	-7.0
Receiver126	131	1	0.0	47.8	66	47.8	10	----	47.8	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	110	0.0	0.0	0.0
All Impacted	25	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0

Qk4, Inc.
JRS

27 August 2019
TNM 2.5
Calculated with TNM 2.5

RESULTS: SOUND LEVELS
PROJECT/CONTRACT: 18407 - US 60 Ballard Co.
RUN: 2040 Build Alt 3
BARRIER DESIGN: INPUT HEIGHTS

ATMOSPHERICS: 68 deg F, 50% RH

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

Receiver Name	No.	#DUs	Existing LAeq1h	No Barrier LAeq1h		Increase over existing		Type Impact	With Barrier Calculated LAeq1h	Noise Reduction		
				Calculated	Crit'n	Calculated	Crit'n Sub'l Inc			Calculated	Goal	Calculated minus Goal
			dBA	dBA	dBA	dB	dB		dBA	dB	dB	dB
Receiver1	1	1	0.0	63.5	66	63.5	10	----	63.5	0.0	7	-7.0
Receiver2	2	1	0.0	62.9	66	62.9	10	----	62.9	0.0	7	-7.0
Receiver3	3	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver4	4	1	0.0	54.4	66	54.4	10	----	54.4	0.0	7	-7.0
Receiver5	5	1	0.0	61.9	66	61.9	10	----	61.9	0.0	7	-7.0
Receiver6	6	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver7	7	1	0.0	61.2	66	61.2	10	----	61.2	0.0	7	-7.0
Receiver8	8	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver9	9	1	0.0	61.5	66	61.5	10	----	61.5	0.0	7	-7.0
Receiver10	10	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver11	11	1	0.0	65.0	66	65.0	10	----	65.0	0.0	7	-7.0
Receiver12	12	1	0.0	52.3	66	52.3	10	----	52.3	0.0	7	-7.0
Receiver13	13	1	0.0	58.8	66	58.8	10	----	58.8	0.0	7	-7.0
Receiver14	14	1	0.0	53.8	66	53.8	10	----	53.8	0.0	7	-7.0
Receiver16	16	1	0.0	56.3	66	56.3	10	----	56.3	0.0	7	-7.0
Receiver17	17	1	0.0	52.3	66	52.3	10	----	52.3	0.0	7	-7.0
Receiver19	19	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver21	21	1	0.0	63.9	66	63.9	10	----	63.9	0.0	7	-7.0
Receiver22	22	1	0.0	49.5	66	49.5	10	----	49.5	0.0	7	-7.0
Receiver23	23	1	0.0	63.6	66	63.6	10	----	63.6	0.0	7	-7.0
Receiver24	24	1	0.0	64.0	66	64.0	10	----	64.0	0.0	7	-7.0
Receiver25	25	1	0.0	38.7	66	38.7	10	----	38.7	0.0	7	-7.0
Receiver27	27	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0

Receiver28	28	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver29	29	1	0.0	58.3	66	58.3	10	----	58.3	0.0	7	-7.0
Receiver30	30	1	0.0	56.1	66	56.1	10	----	56.1	0.0	7	-7.0
Receiver31	31	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver32	32	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver33	33	1	0.0	59.9	66	59.9	10	----	59.9	0.0	7	-7.0
Receiver34	34	1	0.0	56.1	66	56.1	10	----	56.1	0.0	7	-7.0
Receiver35	35	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver36	36	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver37	37	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver38	38	1	0.0	58.9	66	58.9	10	----	58.9	0.0	7	-7.0
Receiver39	39	1	0.0	58.5	66	58.5	10	----	58.5	0.0	7	-7.0
Receiver40	40	1	0.0	48.1	66	48.1	10	----	48.1	0.0	7	-7.0
Receiver42	42	1	0.0	43.0	66	43.0	10	----	43.0	0.0	7	-7.0
Receiver43	43	1	0.0	42.6	66	42.6	10	----	42.6	0.0	7	-7.0
Receiver44	44	1	0.0	40.9	66	40.9	10	----	40.9	0.0	7	-7.0
Receiver45	45	1	0.0	40.6	66	40.6	10	----	40.6	0.0	7	-7.0
Receiver47	47	1	0.0	42.4	66	42.4	10	----	42.4	0.0	7	-7.0
Receiver48	48	1	0.0	42.4	66	42.4	10	----	42.4	0.0	7	-7.0
Receiver49	49	1	0.0	41.8	66	41.8	10	----	41.8	0.0	7	-7.0
Receiver50	50	1	0.0	41.0	66	41.0	10	----	41.0	0.0	7	-7.0
Receiver51	51	1	0.0	40.1	66	40.1	10	----	40.1	0.0	7	-7.0
Receiver52	52	1	0.0	39.8	66	39.8	10	----	39.8	0.0	7	-7.0
Receiver54	54	1	0.0	63.4	66	63.4	10	----	63.4	0.0	7	-7.0
Receiver55	55	1	0.0	64.0	66	64.0	10	----	64.0	0.0	7	-7.0
Receiver56	56	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	7	-7.0
Receiver57	57	1	0.0	62.8	66	62.8	10	----	62.8	0.0	7	-7.0
Receiver58	58	1	0.0	55.1	66	55.1	10	----	55.1	0.0	7	-7.0
Receiver60	60	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	7	-7.0
Receiver61	61	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver62	62	1	0.0	60.6	66	60.6	10	----	60.6	0.0	7	-7.0
Receiver63	63	1	0.0	62.5	66	62.5	10	----	62.5	0.0	7	-7.0
Receiver64	64	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	7	-7.0
Receiver65	65	1	0.0	67.6	66	67.6	10	Snd Lvl	67.6	0.0	7	-7.0
Receiver66	66	1	0.0	44.1	66	44.1	10	----	44.1	0.0	7	-7.0
Receiver67	67	1	0.0	43.6	66	43.6	10	----	43.6	0.0	7	-7.0
Receiver68	68	1	0.0	43.3	66	43.3	10	----	43.3	0.0	7	-7.0
Receiver69	69	1	0.0	42.8	66	42.8	10	----	42.8	0.0	7	-7.0
Receiver70	70	1	0.0	42.5	66	42.5	10	----	42.5	0.0	7	-7.0
Receiver71	71	1	0.0	39.9	66	39.9	10	----	39.9	0.0	7	-7.0

Receiver72	72	1	0.0	42.2	66	42.2	10	----	42.2	0.0	7	-7.0
Receiver73	73	1	0.0	41.6	66	41.6	10	----	41.6	0.0	7	-7.0
Receiver74	74	1	0.0	41.3	66	41.3	10	----	41.3	0.0	7	-7.0
Receiver75	75	1	0.0	40.4	66	40.4	10	----	40.4	0.0	7	-7.0
Receiver77	77	1	0.0	39.8	66	39.8	10	----	39.8	0.0	7	-7.0
Receiver78	78	1	0.0	38.9	66	38.9	10	----	38.9	0.0	7	-7.0
Receiver79	79	1	0.0	38.7	66	38.7	10	----	38.7	0.0	7	-7.0
Receiver80	80	1	0.0	38.9	66	38.9	10	----	38.9	0.0	7	-7.0
Receiver82	82	1	0.0	67.1	66	67.1	10	Snd Lvl	67.1	0.0	7	-7.0
Receiver83	83	1	0.0	68.5	66	68.5	10	Snd Lvl	68.5	0.0	7	-7.0
Receiver84	84	1	0.0	65.5	66	65.5	10	----	65.5	0.0	7	-7.0
Receiver85	85	1	0.0	68.4	66	68.4	10	Snd Lvl	68.4	0.0	7	-7.0
Receiver86	86	1	0.0	67.4	66	67.4	10	Snd Lvl	67.4	0.0	7	-7.0
Receiver87	87	1	0.0	66.3	66	66.3	10	Snd Lvl	66.3	0.0	7	-7.0
Receiver88	88	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	7	-7.0
Receiver89	89	1	0.0	66.8	66	66.8	10	Snd Lvl	66.8	0.0	7	-7.0
Receiver91	10	1	0.0	62.1	66	62.1	10	----	62.1	0.0	7	-7.0
Receiver92	92	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver93	93	1	0.0	63.0	66	63.0	10	----	63.0	0.0	7	-7.0
Receiver95	95	1	0.0	63.3	66	63.3	10	----	63.3	0.0	7	-7.0
Receiver96	96	1	0.0	67.2	66	67.2	10	Snd Lvl	67.2	0.0	7	-7.0
Receiver98	98	1	0.0	44.8	66	44.8	10	----	44.8	0.0	7	-7.0
Receiver100	100	1	0.0	60.2	66	60.2	10	----	60.2	0.0	7	-7.0
Receiver101	101	1	0.0	56.2	66	56.2	10	----	56.2	0.0	7	-7.0
Receiver102	102	1	0.0	49.3	66	49.3	10	----	49.3	0.0	7	-7.0
Receiver103	103	1	0.0	45.5	66	45.5	10	----	45.5	0.0	7	-7.0
Receiver104	104	1	0.0	44.6	66	44.6	10	----	44.6	0.0	7	-7.0
Receiver105	105	1	0.0	43.9	66	43.9	10	----	43.9	0.0	7	-7.0
Receiver106	106	1	0.0	44.0	66	44.0	10	----	44.0	0.0	7	-7.0
Receiver107	107	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver108	108	1	0.0	60.4	66	60.4	10	----	60.4	0.0	7	-7.0
Receiver109	109	1	0.0	60.9	66	60.9	10	----	60.9	0.0	7	-7.0
Receiver110	110	1	0.0	60.5	66	60.5	10	----	60.5	0.0	7	-7.0
Receiver111	111	1	0.0	65.1	66	65.1	10	----	65.1	0.0	7	-7.0
Receiver112	112	1	0.0	58.8	66	58.8	10	----	58.8	0.0	7	-7.0
Receiver114	114	1	0.0	42.9	66	42.9	10	----	42.9	0.0	7	-7.0
Receiver120	120	1	0.0	71.4	66	71.4	10	Snd Lvl	71.4	0.0	7	-7.0
Receiver121	121	1	0.0	59.2	66	59.2	10	----	59.2	0.0	7	-7.0
Receiver122	122	1	0.0	51.5	66	51.5	10	----	51.5	0.0	7	-7.0
Receiver123	123	1	0.0	54.0	66	54.0	10	----	54.0	0.0	7	-7.0

Receiver124	124	1	0.0	59.1	66	59.1	10	----	59.1	0.0	7	-7.0
Receiver125	125	1	0.0	72.3	66	72.3	10	Snd Lvl	72.3	0.0	7	-7.0
Receiver126	126	1	0.0	54.1	66	54.1	10	----	54.1	0.0	7	-7.0

Dwelling Units	# DUs	Noise Reduction		
		Min	Avg	Max
		dB	dB	dB
All Selected	106	0.0	0.0	0.0
All Impacted	14	0.0	0.0	0.0
All that meet NR Goal	0	0.0	0.0	0.0