US 89 Etna North

Environmental Assessment

Noise Technical Memorandum

Introduction

The Wyoming Department of Transportation (WYDOT) and the Federal Highway Administration (FHWA) are proposing improvements to 9.25 miles of US Highway 89 (US 89) in western Wyoming (Lincoln County) between Etna at reference marker (RM) 108.13 and the Town of Alpine (RM 117.38). US 89 provides visitors a route from much of the western United States to the Jackson Hole region and two major national parks (Yellowstone and Grand Teton). One No Build Alternative and two build alternatives are proposed for this project: the 4-Lane Alternative and the 5-Lane Alternative.

Methodology

WYDOT has developed guidelines for the analysis and abatement of highway traffic noise in accordance with regulations developed by the Federal Highway Administration (FHWA) (23 CFR 772). These guidelines are set forth in the document entitled *Wyoming Noise Analysis and Abatement Policy* (July 2011). The methods employed for this analysis are consistent with both FHWA and WYDOT guidelines for analyzing traffic noise and include the following:

- Perform a noise analysis when receptors (discrete or representative locations of a noise sensitive area) are present.
- Determine existing noise levels using FHWA's Measurement of Highway Related Noise guidance.
- Analyze all alternatives for traffic noise impacts based on characteristics that would yield the worst traffic noise impact for the design year (in this case, 2034).
- Consider traffic noise abatement measures.
- Evaluate noise abatement measures based on both feasibility and reasonableness (defined below).

FHWA's approved Traffic Noise Model (TNM 2.5) was used for this analysis. The basic inputs to noise modeling include roadway network layout, site characteristics, traffic volume projections, fleet mix, and vehicular operating speeds. Traffic volumes from existing (2013) and future (2034) traffic models were used to derive Average Annual Daily Traffic (AADT) volumes. The peak-hour volumes were assumed to be 10 percent of the total AADT volumes. The vehicle mix assumed was 94 percent automobiles and 6 percent trucks based on WYDOT traffic data. The existing posted speed limit is 65 miles per hour (mph), except through the Towns of Etna and Alpine, where the speed limit changes to 35 mph. The future posted speed limit will not change.

Highway traffic noise impacts occur when the predicted highway traffic noise levels approach or exceed noise abatement criteria, or when the predicted highway traffic noise levels substantially exceed the existing highway traffic noise levels (defined below). FHWA established Noise Abatement Criteria (NAC) for different types of land uses and human activities, as shown in **Table 1**. **Table 1** depicts noise in A-weighted decibels (dBA), which are sound levels that best approximate the human ear, over a specific period of time, indicated as the hourly equivalent sound level (Leq(h)) and the sound level that is exceeded 10 percent of the time (L10(h)).

Existing Noise Conditions

Numerous noise sensitive receptors exist in the Project Area and were included in the noise model (see attached figures, **Noise Sensitive Receptors**). No category A or G land use activities were identified within the Project Area. Category D activities (indoor noise levels) were not considered because exterior outdoor uses exist on these properties that would be considered a category C activity, which has a higher criterion. The Project Area contains category F activities such as agriculture, but FHWA does not consider these activities as sensitive to noise and does not require their analysis. Therefore, noise sensitive receptors for this project were classified as activity category B (residential), category C (campgrounds, RV park, and place of worship), and category E (commercial). Noise sensitive receptors were grouped together by activity. For example, R3 represents nine single family residential receptors (R3 – R11) because the noise levels and activities are similar for all of them.

Noise measurements were taken at three monitoring locations within the Project Area to determine ambient noise levels. These measurements were used to validate the traffic noise model and ensure noise level predictions are as accurate as possible. Locations were selected that best represent the Project Area, which has relatively flat topography, no existing noise barriers, and no significant changes in traffic and speeds. Therefore, three locations were selected for modeling due to the relative sameness of conditions within the Project Area.

Operating speeds, existing geometry, and traffic counts by vehicle type were collected simultaneously with the noise measurements. Traffic counts and operating speed data were input into the FHWA approved Traffic Noise Model (TNM) 2.5 to validate the noise measurement field recordings (see **Table 2**). The difference between the field recordings and the noise levels predicted by the model was less than 3 dBA. Humans can only detect change over 3 dBA. Therefore, the model validated the field recordings taken in the Project Area.

Noise Impacts

Existing and future noise models were developed for all noise sensitive receptors within the Project Area. All modeled noise sensitive receptors are depicted in Appendix A. The modeled noise levels for existing conditions and the No Build Alternative, 4-Lane Alternative, and 5-Lane Alternative for design year 2034 are presented in Appendix B.

Existing Conditions

Under existing conditions, noise sensitive receptors would not be impacted by traffic noise within the Project Area.

No Build Alternative

In design year 2034, 10 receptors would approach or exceed the NAC under the No Build Alternative. However, since actual spot safety improvements have yet to be identified, noise abatement measures were not considered for this alternative.

5-Lane Alternative

By the year 2034, the 5-Lane Alternative would result in 23 receptors approaching or exceeding the NAC. Therefore, noise abatement was considered for all impacted receptors. However, no receptors would experience a substantial noise increase of 15 dBA over existing conditions.

4-Lane Alternative

By the year 2034, the 4-Lane Alternative would result in 19 receptors approaching or exceeding the NAC. Therefore, noise abatement was considered for all impacted receptors. However, no receptors would experience a substantial noise increase of 15 dBA (as defined above) over existing conditions.

Noise Abatement Measures

When traffic noise impacts are identified, noise abatement must be considered and evaluated for both feasibility and reasonableness for each receptor location. Feasibility is the combination of acoustical and engineering factors. Reasonableness is the combination of social, economic, and environmental factors. Impacted areas were evaluated for consideration of noise abatement according to Wyoming Noise Analysis and Abatement Guidelines (July 2011). Four noise abatement measures were considered for this project:

- **Alteration of the vertical or horizontal roadway alignment:** Businesses and residences would

Table 1 FHWA Noise Abatement Criteria, Hourly A-Weighted Sound Level Decibels (dBA)[1]

Activity Category	Activity Leq(h)	Criteria[2] L10(h)	Evaluation Location	Description of Activities
A	57	60	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[3]	67	70	Exterior	Residential
C[3]	67	70	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52	55	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E[3]	72	75	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A – D or F.
F	NA	NA	NA	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	NA	NA	NA	Undeveloped lands that are not permitted for development.

Source: Wyoming Department of Transportation, Noise Analysis and Abatement Policy, July 2011.

1 – Either Leq(h) or L10(h) (but not both) may be used on a project.

2 – The Leq(h) and L10(h) Activity Criteria values are for impacted determination only, and are not design standards for noise abatement measures.

3 – Includes undeveloped lands permitted for this activity category.

Table 2 Field Recorded and Modeled Noise Levels

Location	Field Recorded Noise Levels L(eq)	TNM Predicted Noise Levels L(eq)	Difference L(eq)
Meter #1 – Campgrounds north of CR 111	56.6	56.5	+2.9 dBA
Meter #2 – Place of Worship in Etna	63.2	62.1	-1.1 dBA
Meter #3 – North of Sanderson Lane (CR 107)	62.1	63.4	+1.3 dBA

lose direct access by alteration of the vertical roadway alignment. It would be costly to suppress the roadway in an effort to try and avoid noise impacts. In addition, suppressing the roadway would require a very tall wall to mitigate for traffic noise impacts, resulting in a higher cost (greater than $23,000) per benefited receptor. Further, alteration of the horizontal alignment would result in additional right-of-way and noise impacts.

- **Noise buffers by acquisition of undeveloped land:** The noise sensitive receptors are located adjacent to the Project Area. Buffer zones would have to be placed in between the roadway and the noise sensitive receptor in order to achieve a substantial noise reduction. Therefore, acquiring undeveloped land for buffer zones would not be reasonable and feasible because large amounts of land would need to be purchased to mitigate for noise impacts.
- **Traffic management:** US 89 is classified as a regional highway and is the primary transportation corridor in the region. Therefore, restricting truck traffic and providing alternate routes for truck traffic is not feasible. Further, the percentage of trucks that use this roadway is minimal.
- **Noise barriers:** Noise barriers are the most common form of noise abatement since they usually provide a greater insertion loss and are generally more feasible to engineer compared to other measures. Therefore, noise barriers were considered for all impacted receptors in the Project Area.

A feasible noise barrier must achieve at least a 5 dBA noise reduction by at least one impacted receptor in predicted future noise levels. Constructability, engineering, maintenance, and other design issues must also be considered. For example, a noise barrier cannot create a safety or unacceptable maintenance problem or engineering fatal flaw, such as reduction of line-of-sight, accessibility deficiencies, icing, or other notable roadway maintenance concerns.

Noise abatement is considered reasonable if it meets the noise reduction design goal, meets an acceptable cost per benefited receptor, and considers the benefited receptor's desires.

- The noise reduction design goal of 7 dBA must be met by at least one benefited receptor, and 5 dBA noise reduction for additional receptors (impacted or not) based on WYDOT noise policy.
- The cost per benefited receptor is $23,000.
- Fifty-one percent of the benefited receptors must agree to the noise abatement measures.

Noise barriers were not modeled for individual residential receptors with driveways adjacent to US 89 because gaps would be required for these access points, rendering the barriers ineffective. Further, placing walls close to access points would result in inadequate sight distance, which would be a safety concern, and therefore would not meet the feasibility criteria for construction. However, noise barriers could meet the required criteria for two areas. Barrier 1 was modeled for receptors R19 – R24 and Barrier 2 was modeled for receptors R47 – R50. Due to site access, these barriers were further divided into "a" and "b" to represent the north and south sections.

Barriers 1a and 1b

Noise barriers 1a and 1b were modeled at heights up to 12 feet within the US 89 right-of-way. The noise barrier was modeled at appropriate setbacks (approximately 25 feet) from adjacent roadways to avoid sight distance constraints. **Table 3** summarizes the noise levels with and without abatement, as well as the noise reduction provided by the abatement measure. **Table 4** summarizes the noise barrier analysis.

Under both build alternatives, noise barriers 1a and 1b meet the 5 dBA feasible noise reduction criteria and the reasonable noise reduction criteria of at least 7 dBA for at least one receptor (see **Table 3**). However, as shown in **Table 4**, the cost per benefited receptor exceeds WYDOT's cost reasonable criteria threshold of $23,000. Therefore, noise barriers would not be reasonable for the noise receptors in this area with implementation of either alternative.

Barriers 2a and 2b

Noise barriers 2a and 2b were modeled at heights up to 12 feet within the US 89 right-of-way. The noise barrier was modeled at appropriate setbacks (approxi-

Table 3 Noise Abatement Analysis for Barriers 1a and 1b

Benefited Receptor	2034 Predicted Noise Level without Abatement (dBA)	2034 Predicted Noise Level with 12 Foot Tall Barrier	Noise Reduction (dBA)
4-Lane Alternative			
R19	60.8	54.1	**6.7**
R20	**66.9**	54.5	**12.5**
R21	61.1	55.3	**5.8**
R22	61.6	57.3	4.4
R23	61.2	56.9	4.4
R24	**65.7**	58.6	**7.2**
5-Lane Alternative			
R19	61.2	54.9	**6.9**
R20	**66.8**	55	**12.6**
R21	61.2	56	**5.8**
R22	61.7	58	4.4
R23	61.3	57.4	4.5
R24	**65.6**	59.2	**7.1**

Table 4 Noise Barrier Analysis for Barriers 1a and 1b

Barrier	Total Length of Barrier (feet)	Height of Barrier (feet)	Total Cost of Barrier*	# of Benefited Receptors	Cost/Benefited Receptor
4-Lane Alternative					
1a	733	12	$329,850	4	124,538
1b	374	12	$168,300		
Total	**1,107**	**12**	**$498,150**		
5-Lane Alternative					
1a	733	12	$329,850	4	124,538
1b	374	12	$168,300		
Total	**1,107**	**12**	**$498,150**		

**The cost of materials based on $45/sq ft.*

mately 25 feet) from adjacent roadways to avoid sight distance constraints. **Table 5** summarizes the noise levels with and without abatement, as well as the noise reduction provided by the abatement measure. **Table 6** summarizes the noise barrier analysis.

Under both build alternatives, noise barriers 2a and 2b do not meet the 5 dBA feasible noise reduction criteria or the reasonable noise reduction criteria of at least 7 dBA for at least one receptor (see **Table 5**). In addition, as shown in **Table 6**, the cost per benefited receptor exceeds WYDOT's cost reasonable criteria threshold of $23,000. Therefore, noise barriers would not be feasible and reasonable for the noise receptors in this area with implementation of either alternative.

Conclusions and Recommendations

At this time, noise barriers 1a and 1b meet the feasible criteria, but do not meet the reasonable criteria. Noise barriers 2a and 2b do not meet the feasible or reasonable criteria. Noise abatement must be both feasible and reasonable. Therefore, noise barriers are not recommended for this project. However, if substantial changes are made to this project's design elements, the noise analysis will need to be re-assessed to evaluate the impact of those changes.

Table 5 Noise Abatement Analysis for Barriers 2a and 2b

Benefited Receptor	2035 Predicted Noise Level without Mitigation (dBA)	2035 Predicted Noise Level with 12 Foot Tall Barrier	Noise Reduction (Decibel)
4-Lane Alternative			
R47	**66.4**	60.6	5.9
R48	60.7	54.9	5.8
R49	51.2	47.8	3.4
R50	**68.3**	**66**	2.3
5-Lane Alternative			
R47	**66.6**	61.4	**6**
R48	60.4	55.3	5.7
R49	51.3	49.6	2.1
R50	**68.8**	**67.6**	1.9

Table 6 Noise Barrier Analysis for Barriers 1a and 1b

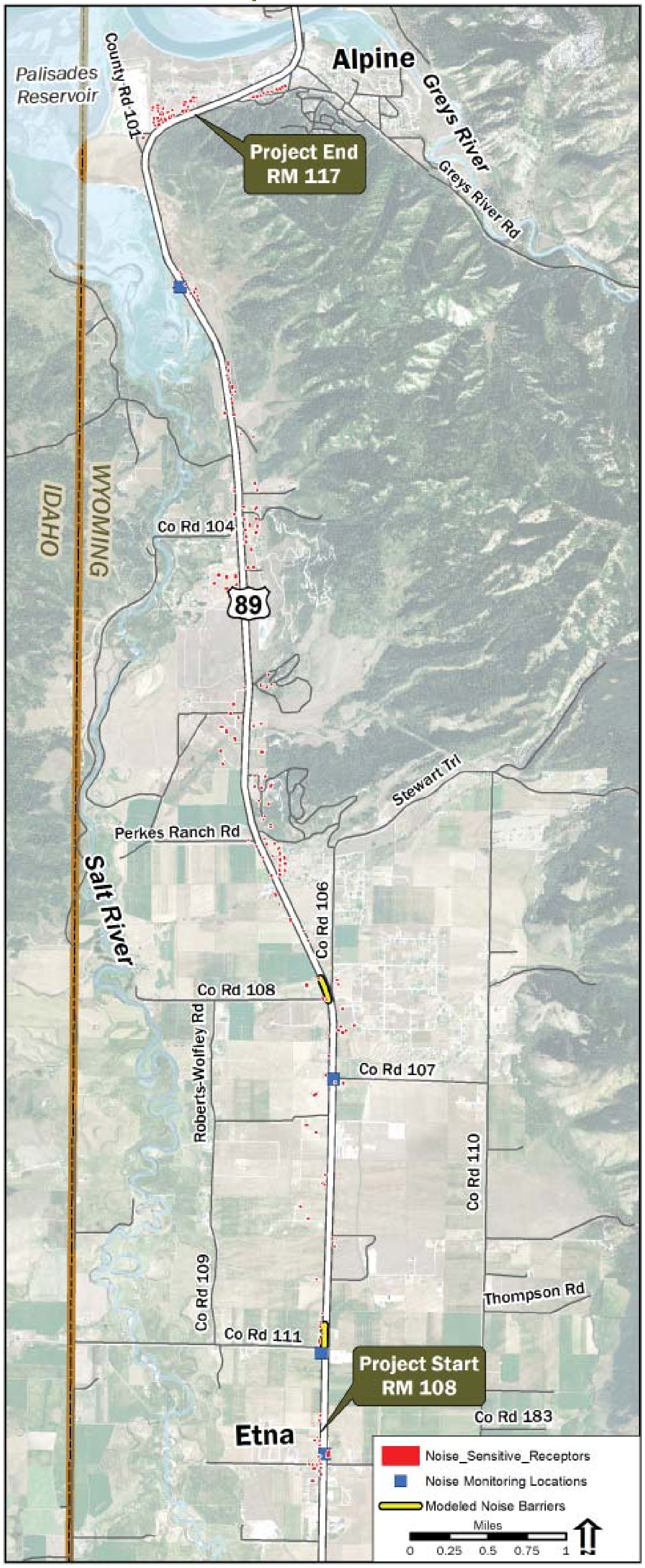
Barrier	Total Length of Barrier (feet)	Height of Barrier (feet)	Total Cost of Barrier*	# of Benefited Receptors	Cost/Benefited Receptor
4-Lane Alternative					
2a	280	12	$151,200	0	586,440
2b	806	12	$435,240		
Total	**1,086**	**12**	**$586,440**		
5-Lane Alternative					
2a	280	12	$151,200	0	586,440
2b	806	12	$435,240		
Total	**1,086**	**12**	**$586,440**		

**The cost of materials based on $45/sq ft.*

APPENDIX A

Noise Sensitive Receptors Modeled

Noise Sensitive Receptors Modeled



APPENDIX B

Existing and Future Noise Models

Existing and future noise models were developed for all noise sensitive receptors within the US 89 Project Area. The modeled noise levels for existing conditions, the No Build Alternative, and the build alternatives are shown in the table below. The highlighted rows indicate additional receptors that apply to the 5-Lane Alternative only. All other rows (receptors) apply to both the 4-Lane and the 5-Lane Alternative.

Receptors	Existing Noise Levels	No Build Alternative Noise Levels	Build Alternatives Noise Levels	Difference	Build Alternatives Impact?
Receiver1	48.2	49.5	51.6	3.4	No
Receiver2	62.9	64.2	64.1	1.2	No
Receiver3	62.2	63.5	63.2	1	No
Receiver4	49.2	50.5	52.6	3.4	No
Receiver5	60.4	61.8	62	1.6	No
Receiver6	50.5	51.9	54	3.5	No
Receiver7	47.7	49.1	50.9	3.2	No
Receiver8	45.2	46.6	47.9	2.7	No
Receiver9	54.6	55.9	58	3.4	No
Receiver10	53.1	54.5	56.5	3.4	No
Receiver11	56.5	57.8	59.8	3.3	No
Receiver12	54	55.3	57.7	3.7	No
Receiver13	56.3	57.7	59.7	3.4	No
Receiver14	54.5	55.9	58	3.5	No
Receiver15	48.9	50.2	52.1	3.2	No
Receiver16	51.1	52.5	54.6	3.5	No
Receiver17	55.5	56.9	58.8	3.3	No
Receiver18	58.2	59.6	60.8	2.6	No
Receiver19	56	59.3	61.2	5.2	No
Receiver20	61.5	65	**66.8**	5.3	**Yes**
Receiver21	56.4	59.7	61.2	4.8	No
Receiver22	56.9	60.3	61.7	4.8	No
Receiver23	56.4	59.8	61.3	4.9	No
Receiver24	60.6	64	**65.6**	5	**Yes**
Receiver25	50.5	53.5	56.6	6.1	No
Receiver26	55.2	58.5	61.1	5.9	No
Receiver27	61.1	64.6	**67.1**	6	**Yes**
Receiver28	44.1	46.6	48.7	4.6	No
Receiver29	40.9	43.2	44.7	3.8	No
Receiver30	57.6	61	62.7	5.1	No
Receiver31	54.7	58	60.2	5.5	No
Receiver32	58.7	62.1	63.7	5	No
Receiver33	47.1	49.9	52.4	5.3	No
Receiver34	42.4	44.8	46.6	4.2	No
Receiver35	46.7	49.4	51.8	5.1	No
Receiver36	62.3	**65.8**	**68.1**	5.8	**Yes**

Receptors	Existing Noise Levels	No Build Alternative Noise Levels	Build Alternatives Noise Levels	Difference	Build Alternatives Impact?
Receiver37	50.2	53.3	56.8	6.6	No
Receiver38	54.4	57.6	60.4	6	No
Receiver39	62.1	**65.6**	**67.1**	5	**Yes**
Receiver40	60.3	63.8	**65.6**	5.3	Yes
Receiver41	43.3	45.8	48.5	5.2	No
Receiver42	48.7	51.6	55.3	6.6	No
Receiver43	52.1	55.3	58.9	6.8	No
Receiver44	57.6	61	63.6	6	No
Receiver45	54.2	57.5	60.6	6.4	No
Receiver46	51.4	54.5	57.7	6.3	No
Receiver47	61.1	64.6	**66.6**	5.5	**Yes**
Receiver48	54.9	58.2	60.4	5.5	No
Receiver49	46.3	49	51.3	5	No
Receiver50	63.3	**66.8**	**68.8**	5.5	**Yes**
Receiver51	48.7	51.6	54.6	5.9	No
Receiver52	48.8	51.8	54.8	6	No
Receiver53	61.7	65.2	**67.4**	5.7	**Yes**
Receiver54	61.5	64.9	**67.6**	6.1	**Yes**
Receiver55	61.4	64.9	**66.7**	5.3	**Yes**
Receiver56	53.1	56.3	58.6	5.5	No
Receiver57	55.4	58.7	60.7	5.3	No
Receiver58	63.1	**66.6**	**68.9**	5.8	**Yes**
Receiver59	58.5	61.9	64.1	5.6	No
Receiver60	49.7	52.6	55.6	5.9	No
Receiver61	55.6	58.8	61.1	5.5	No
Receiver62	52	55.1	58	6	No
Receiver63	47.1	49.9	52.7	5.6	No
Receiver64	49.8	52.7	56.2	6.4	No
Receiver65	46.1	48.8	51.5	5.4	No
Receiver66	54.6	57.8	60.7	6.1	No
Receiver67	47.3	50	53.1	5.8	No
Receiver68	47.2	49.9	53	5.8	No
Receiver69	63	**66.4**	**68.5**	5.5	**Yes**
Receiver70	60.5	64	**66.2**	5.7	**Yes**
Receiver71	47.4	50.2	53.4	6	No
Receiver72	56.2	59.5	62.1	5.9	No
Receiver73	55.4	58.7	61	5.6	No
Receiver74	52	55.1	58.2	6.2	No
Receiver75	48.4	51.4	54.8	6.4	No
Receiver76	46.1	48.8	51.2	5.1	No

Receptors	Existing Noise Levels	No Build Alternative Noise Levels	Build Alternatives Noise Levels	Difference	Build Alternatives Impact?
Receiver77	46	48.7	50.9	4.9	No
Receiver78	48.9	51.8	54.5	5.6	No
Receiver79	47.6	50.4	52.7	5.1	No
Receiver80	44.2	46.7	48.3	4.1	No
Receiver81	49.4	52.4	54.4	5	No
Receiver82	51.3	54.4	57.3	6	No
Receiver83	46.4	49.1	51.4	5	No
Receiver84	42.3	44.7	46.3	4	No
Receiver85	44.2	46.8	48.8	4.6	No
Receiver86	50.5	53.5	57	6.5	No
Receiver87	46.5	49.2	51.9	5.4	No
Receiver88	43.7	46.2	48.6	4.9	No
Receiver89	42.6	45	47.1	4.5	No
Receiver90	51.1	54.2	57.3	6.2	No
Receiver91	44.5	47.1	49.4	4.9	No
Receiver92	42.6	45	47	4.4	No
Receiver93	54.9	58.1	60.7	5.8	No
Receiver94	47.8	50.7	53.8	6	No
Receiver95	52.5	55.6	58.7	6.2	No
Receiver96	46.5	49.2	52	5.5	No
Receiver97	48.1	50.9	53.8	5.7	No
Receiver98	61.5	65	**66.8**	5.3	**Yes**
Receiver99	48.9	51.9	55.2	6.3	No
Receiver100	45.2	47.8	50.5	5.3	No
Receiver101	42.9	45.4	47.6	4.7	No
Receiver102	44	46.6	48.9	4.9	No
Receiver103	44.4	47	49.4	5	No
Receiver104	51.3	54.4	57.7	6.4	No
Receiver105	48.4	51.3	54.2	5.8	No
Receiver106	47.1	50	52.3	5.2	No
Receiver107	56.4	59.7	61.4	5	No
Receiver108	55.8	59.2	60.7	4.9	No
Receiver109	46.8	49.5	52	5.2	No
Receiver110	43.1	45.6	47.4	4.3	No
Receiver111	41.3	43.6	45.1	3.8	No
Receiver112	57.8	61.2	62.8	5	No
Receiver113	50	53	56.3	6.3	No
Receiver114	50.7	53.8	57.2	6.5	No
Receiver115	58.1	61.5	63.3	5.2	No
Receiver116	57.5	60.8	62.9	5.4	No

Receptors	Existing Noise Levels	No Build Alternative Noise Levels	Build Alternatives Noise Levels	Difference	Build Alternatives Impact?
Receiver117	58.2	61.6	63.8	5.6	No
Receiver118	47.1	49.9	52.6	5.5	No
Receiver119	50.9	54	57.4	6.5	No
Receiver120	45.7	48.4	50.9	5.2	No
Receiver121	59.2	62.7	64.2	5	No
Receiver122	46.4	49.2	51.8	5.4	No
Receiver123	59.6	63	**65.5**	5.9	**Yes**
Receiver124	46.2	48.9	51.6	5.4	No
Receiver125	60	63.5	64.6	4.6	No
Receiver126	63.5	67.1	68.2	4.7	Yes
Receiver127	44.4	47	49.3	4.9	No
Receiver128	45.6	48.3	50.9	5.3	No
Receiver129	44.4	47	49.6	5.2	No
Receiver130	52.9	56	59.6	6.7	No
Receiver131	62.2	**65.7**	**66.9**	4.7	**Yes**
Receiver132	57.3	60.6	**65.8**	8.5	**Yes**
Receiver133	59.9	63.3	**65.6**	5.7	**Yes**
Receiver134	57.8	61.1	63.8	6	No
Receiver135	52	55.1	58.8	6.8	No
Receiver136	56	59.3	62.1	6.1	No
Receiver137	57.9	61.2	63.8	5.9	No
Receiver138	63.7	**67.2**	**68**	4.3	**Yes**
Receiver139	57.7	61	63.6	5.9	No
Receiver140	56.3	59.6	62.2	5.9	No
Receiver141	56.6	60	61.2	4.6	No
Receiver142	54.3	57.6	59.4	5.1	No
Receiver143	63.2	**66.7**	**68.4**	5.2	**Yes**
Receiver144	55.7	59.1	60.4	4.7	No
Receiver145	52.1	55.3	57.7	5.6	No
Receiver146	63	**66.5**	**68.3**	5.3	**Yes**
Receiver147	58.1	61.5	63	4.9	No
Receiver148	58.3	61.7	63.2	4.9	No
Receiver149	52.9	54.2	55.8	2.9	No
Receiver150	41.9	43.3	45	3.1	No
Receiver151	42.9	44.2	46.1	3.2	No
Receiver152	45.8	47.1	49.5	3.7	No
Receiver153	47.1	48.4	50.9	3.8	No
Receiver154	47.6	49	51.5	3.9	No
Receiver155	49	50.4	52.7	3.7	No
Receiver156	50.6	52	54.1	3.5	No

Receptors	Existing Noise Levels	No Build Alternative Noise Levels	Build Alternatives Noise Levels	Difference	Build Alternatives Impact?
Receiver157	54	55.4	57	3	No
Receiver158	56.9	58.2	60.2	3.3	No
Receiver159	56.5	57.9	60.2	3.7	No
Receiver160	54.1	55.4	57.6	3.5	No
Receiver161	50.8	52.2	54.4	3.6	No
Receiver162	49.9	51.2	53.7	3.8	No
Receiver163	48	49.3	51.9	3.9	No
Receiver164	51.8	53.2	55.4	3.6	No
Receiver165	49.7	51	53.7	4	No
Receiver166	57.4	58.8	60.8	3.4	No
Receiver167	53.8	55.1	57	3.2	No
Receiver168	51.8	53.1	55.3	3.5	No
Receiver169	58	59.3	61.5	3.5	No
Receiver170	57.6	58.9	60.8	3.2	No
Receiver171	54.9	56.3	58	3.1	No
Receiver172	56	57.3	59.2	3.2	No
Receiver173	41.8	43.2	44.9	3.1	No
Receiver174	43.1	44.5	46.4	3.3	No
Receiver175	44.8	46.2	48.4	3.6	No
Receiver176	47.3	48.7	51.2	3.9	No
Receiver177	48.9	50.3	52.7	3.8	No
Receiver178	46.3	47.7	50	3.7	No
Receiver179	45.2	46.6	48.8	3.6	No
Receiver180	48.3	49.6	52.3	4	No
Receiver181	48.4	49.8	52.3	3.9	No
Receiver182	54.1	55.5	57.7	3.6	No
Receiver183	56.2	57.6	59.6	3.4	No
Receiver184	53.7	55.1	57.3	3.6	No
Receiver185	50.6	51.9	54.4	3.8	No
Receiver186	47.8	49.1	51.8	4	No
Receiver187	46.8	48.2	50.5	3.7	No
Receiver188	47.3	48.7	51.3	4	No
Receiver189	48.2	49.5	52.2	4	No
Receiver190	45.9	47.2	49.3	3.4	No
Receiver191	46.4	47.8	50	3.6	No
Receiver192	49.3	50.6	52.8	3.5	No
Receiver193	48.2	49.6	51.8	3.6	No
Receiver194	47.2	48.5	50.5	3.3	No
Receiver195	48.2	49.5	51.8	3.6	No
Receiver196	47.5	48.8	50.9	3.4	No

Receptors	Existing Noise Levels	No Build Alternative Noise Levels	Build Alternatives Noise Levels	Difference	Build Alternatives Impact?
Receiver197	46.3	47.7	49.5	3.2	No
Receiver198	46.2	47.6	49.4	3.2	No
Receiver199	45.8	47.2	48.9	3.1	No
Receiver200	46.1	47.4	49.2	3.1	No
Receiver201	45.7	47.1	48.8	3.1	No