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Noise Technical Report for the Syracuse 2000 West Interchange

in support of the
Re-evaluation of the Environmental Impact Statement

West Davis Corridor Project

Utah Department of Transportation

UDOT
udot.utah.gov

Project No. S-R199(229)

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The environmental review, consultation, and other actions required by applicable federal environmental laws for this project are being or have been carried out by the Utah Department of Transportation (UDOT) pursuant to 23 United States Code (USC) Section 327 and a Memorandum of Understanding (MOU) dated January 17, 2017, and executed by FHWA and UDOT.

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
EIS	Environmental Impact Statement
FHWA	Federal Highway Administration
L_{eq}	equivalent noise level
LOS	level of service
ML	monitoring location
mph	miles per hour
NA	not applicable
NAC	noise-abatement criteria
RFP	Request for Proposal
S.R.	State Route
UDOT	Utah Department of Transportation
WDC	West Davis Corridor

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1 Introduction

The purpose of this technical report is to evaluate the expected changes in noise impacts and mitigation, as documented in the West Davis Corridor (WDC) Final Environmental Impact Statement (EIS) and Record of Decision (ROD), compared to the Request for Proposal (RFP) design for the WDC in the area of the Syracuse 2000 West Interchange in Davis County, Utah.

The WDC Record of Decision was signed on September 29, 2017. A re-evaluation of the EIS that evaluated the new designs of the 2000 West interchange ramps, park-and-ride lot, and detention basins was prepared in February 2020. This report evaluates the traffic-generated noise impacts from this change. More details about this change are described in Section 2, Project Description, of this report.

This noise analysis was prepared in accordance with the Utah Department of Transportation's (UDOT) Noise Abatement Policy, last revised June 15, 2017, which is consistent with federal regulation 23 Code of Federal Regulations (CFR) Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*, and Utah Administrative Code Rule R930-3, *Highway Noise Abatement*.

2 Project Description

The project area for this report is the area along the WDC from about 2300 West to 1000 West in Syracuse, Utah.

The EIS Selected Alternative proposed an interchange at 2000 West in Syracuse. The EIS Selected Alternative Syracuse 2000 West interchange had the WDC going over 2000 West and included a park-and-ride lot and detention basins.

After the completion of the WDC ROD, the more-detailed engineering for the RFP revised the design of the 2000 West interchange ramps, park-and-ride lot, and detention basins. These changes were made to provide more perpendicular ramp intersections on 2000 West and to better utilize properties purchased by UDOT near the 2000 West interchange.

Applicability

The Refined Selected Alternative is new highway construction. Therefore, this project is a Type 1 project that requires considering noise-abatement measures.

What is a Type 1 project?

According to UDOT's Noise Abatement Policy, a Type 1 project is a project that alters the horizontal or vertical alignment of a road or increases the number of through travel lanes.

UDOT evaluated noise impacts using noise models and methodologies approved by the Federal Highway Administration (FHWA) and UDOT (*Noise Abatement*, UDOT 08A2-01, revised June 15, 2017). Noise impacts were identified and evaluated at residential and other locations (for example, schools and recreation sites) within about 500 feet from the nearest travel lane using traffic volumes at a level of service (LOS) C to represent the worst-case noise conditions while traffic is operating at uncongested, free-flow speeds of 65 miles per

hour (mph) on the WDC, 45 mph on the on and off ramps, and 45 mph on arterial roads that cross the WDC.

3 Characteristics of Noise

Sound travels through the air as waves of minute air-pressure fluctuations caused by vibration. In general, sound waves travel away from the noise source as an expanding spherical surface. As a result, the energy contained in a sound wave is spread over an increasing area as it travels away from the source. This results in a decrease in loudness at greater distances from the noise source.

Sound-level meters measure the actual pressure fluctuations caused by sound waves and record separate measurements for different sound frequency ranges. The decibel (dB) scale used to describe sound is a logarithmic scale that accounts for the large range of sound-pressure levels in the environment. Most sounds consist of a broad range of sound frequencies. Several frequency-weighting schemes have been used to develop composite decibel scales that approximate the way the human ear responds to sound levels. The A-weighted decibel (dBA) scale most closely approximates the way the human ear hears sounds and is the most widely used scale in assessing traffic-related noise impacts. Typical A-weighted noise levels for various types of sound sources are summarized in Table 1.

Varying noise levels are often described in terms of the equivalent noise level (L_{eq}). Equivalent noise levels are used to develop single-value descriptions of average noise exposure over stated periods of time (for example, 1 hour) and are generally based on A-weighted sound-level measurements.

The logarithmic nature of decibel scales is such that individual decibel ratings for different noise sources cannot be added directly to give the noise level for the combined noise source. For example, two noise sources that produce equal decibel ratings at a given location will produce a combined noise level that is 3 dBA greater than either sound alone. When two noise sources differ by 10 dBA, the combined noise level will be 0.4 dBA greater than the louder source alone.

People generally perceive a 10-dBA increase in a noise source as a doubling of loudness. For example, a 70-dBA sound will be perceived by an average person as twice as loud as a 60-dBA sound. People generally cannot detect a 1-to-2-dBA increase in noise levels. Under ideal listening conditions, differences of 2 or 3 dBA can be detected by some people. A 5-dBA change would probably be perceived by most people under normal listening conditions.

When distance is the only factor considered, sound levels from isolated point sources of noise typically decrease by about 6 dBA for every doubling of distance from the noise source. When the noise source is a continuous line (for example, vehicle traffic on a highway), noise levels decrease by about 3 dBA for every doubling of distance away from the source.

Table 1. Weighted Noise Levels and Human Response

Sound Source	dBA[a]	Response Descriptor
Carrier deck jet operation	140	Limit of amplified speech
	130	Painfully loud
Jet takeoff (200 feet) Auto horn (3 feet)	120	Threshold of feeling and pain
Riveting machine Jet takeoff (2,000 feet)	110	
Shout (0.5 foot) New York subway station	100	Very annoying
Heavy truck (50 feet) Pneumatic drill (50 feet)	90	Hearing damage (8-hour exposure)
Passenger train (100 feet) Helicopter (in-flight, 500 feet) Freight train (50 feet)	80	Annoying
Freeway traffic (50 feet)	70	Intrusive
Air conditioning unit (20 feet) Light auto traffic (50 feet)	60	
Normal speech (15 feet)	50	Quiet
Living room, bedroom, library	40	
Soft whisper (15 feet)	30	Very quiet
Broadcasting studio	20	
	10	Just audible
	0	Threshold of hearing

Source: CEQ 1970

[a] Typical A-weighted noise levels taken with a sound-level meter and expressed as decibels on the "A" scale. The "A" scale approximates the frequency response of the human ear.

Noise levels at different distances can also be affected by factors other than the distance from the noise source. Topographic features and structural barriers that absorb, reflect, or scatter sound waves can increase or decrease noise levels. Atmospheric conditions (wind speed and direction, humidity levels, and temperatures) can also affect the degree to which sound is attenuated over distance.

4 Regulatory Setting

The federal regulation that FHWA uses to assess noise impacts is 23 CFR Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise*. This regulation was most recently updated on July 13, 2010. Utah Administrative Code Rule R930-3, *Highway Noise Abatement*, and UDOT's Noise Abatement Policy 08A2-01, revised June 15, 2017, establish UDOT's noise impact and abatement policies and procedures, which are compliant with 23 CFR Part 772.

Noise-abatement criteria (NAC) are used to define the noise levels that are considered an impact (in hourly A-weighted sound-level decibels) for each land use activity category. UDOT's Noise Abatement Policy states that a traffic noise impact occurs when either (1) the future worst-case noise level is equal to or greater than the UDOT NAC for specified land use activity categories or (2) the future worst-case noise level is greater than or equal to an increase of 10 dBA over the existing noise level (substantial increase).

The UDOT NAC are summarized in Table 2.

Table 2. UDOT's Noise-abatement Criteria

Activity Category	L_{eq} Noise Levels (dBA)	Description of Activity Category
A	56 (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	66 (exterior)	Residential.
C	66 (exterior)	Active sports areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails and trail crossings.
D	51 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting room, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	71 (exterior)	Hotels, motels, offices, restaurants/bars, and other undeveloped lands, properties, or activities not included in categories 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.

Source: UDOT 2017

5 Affected Environment

The noise study area (see Figure 1 through Figure 3) includes parts of Syracuse, Utah, within an 500-foot buffer from the nearest travel lane of WDC from 2300 West to 1000 West.

The project corridor is a mix of undeveloped land and residential developments. The predominant source of existing noise in the noise study area is automobile and truck traffic on the existing 2000 West and residential roads.

5.1 Noise Monitoring

Existing noise levels in the noise study area were determined during the Final EIS process by taking short-term (15-minute) sound-level measurements at four locations in this portion of the noise study area with a Larson-Davis model 824 sound-level meter. Noise-measurement locations were selected to represent existing residential developments or other areas where people could be exposed to traffic noise for extended periods. Noise-monitoring locations (ML) are shown in Figure 1 through Figure 3Figure 1, and the associated measured noise levels are listed in Table 3.

Table 3. Measured Noise Levels in the Noise Study Area

Monitoring Location	Address	Activity Category[a]	Measured Noise Level (dBA L_{eq}, rounded)
ML-24	Jensen Nature Park (3300 South 1400 West, Syracuse)	C	45

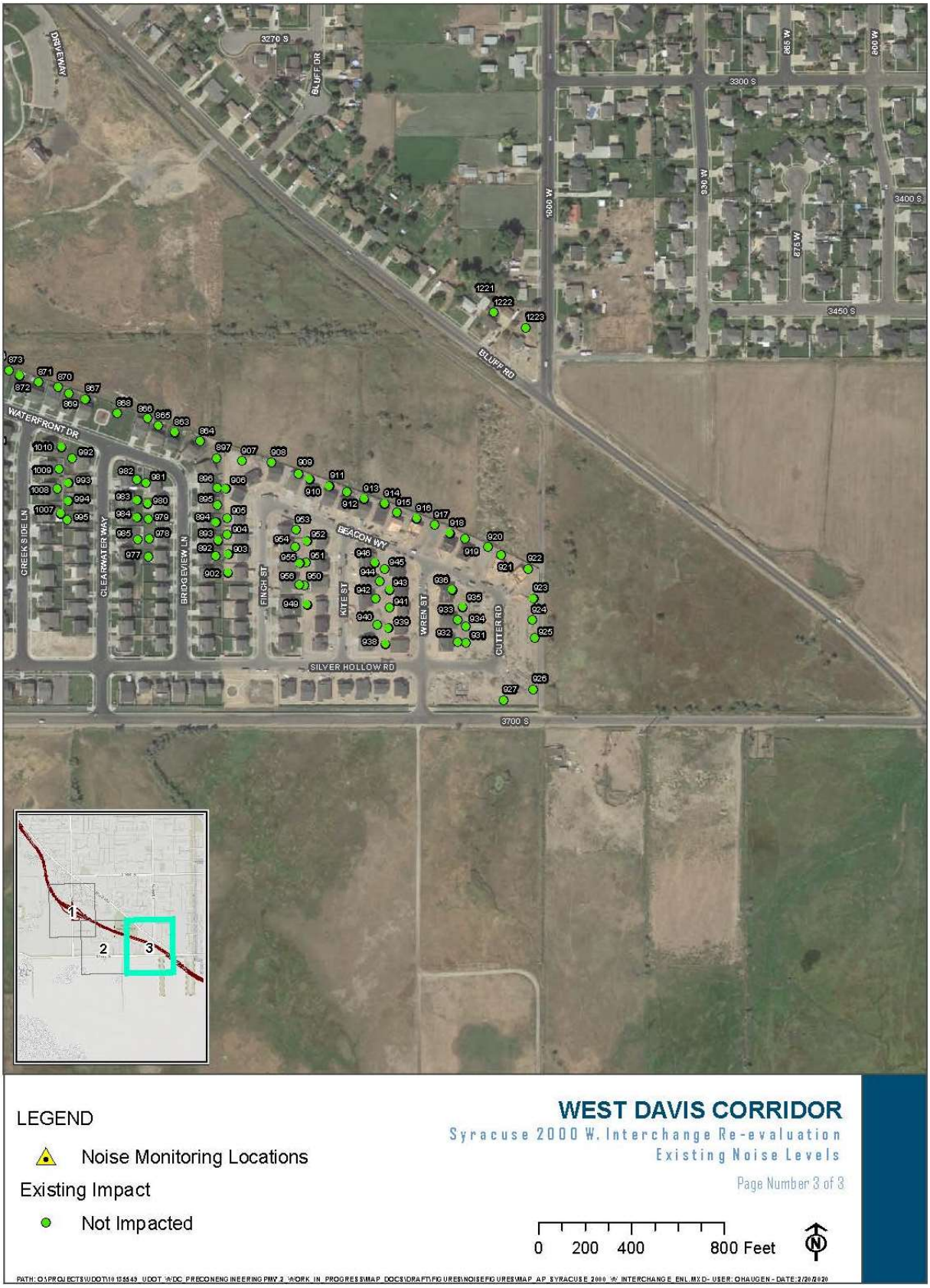
[a] For descriptions of the activity categories, see Table 2, UDOT's Noise-abatement Criteria, above.

Measured noise levels were used to characterize the existing noise environment. Measured noise levels in the noise study area were 45 dBA. As a comparison, typical noise levels range from 35 to 50 dBA in rural and agricultural areas, 50 to 65 dBA in suburban to urban areas, and 65 to 75 dBA in downtown urban areas.

Figure 1. Existing Noise Receptor Map (1 of 3)

Figure 2. Existing Noise Receptor Map (2 of 3)

Figure 3. Existing Noise Receptor Map (3 of 3)



5.2 Existing Noise Levels

The primary source of existing noise in the noise study area is automobile and truck traffic on 2000 West and the nearby residential streets. Existing traffic noise levels for receptors in the noise study area were estimated based on the measurement of existing noise levels taken at ML-24, which was the closest monitoring location to this area. Under existing conditions, no receptors exceeded the NAC of 66 dBA. The locations of the receptors are shown above in Figure 1 through Figure 3, Existing Noise Receptor Map.

The noise model developed for the existing conditions scenario included 345 receptors (representing 344 individual dwelling units and one recreation sites) throughout the noise study area. With the Refined Selected Alternative, UDOT would acquire three residential properties located on 2000 West. Properties to be acquired will be demolished and were not included as receptors in the noise analysis for the Refined Selected Alternative's build scenario.

Traffic-related noise impacts with the Refined Selected Alternative were estimated with FHWA's Traffic Noise Model version 2.5 based on the proposed roadway design as shown in Figure 4 through Figure 6, Build Scenario Noise Receptor Map. The modeled roadway included the proposed WDC improvements between 2300 West and 1000 West. Roadway links were modeled in 100-foot increments to provide a high degree of accuracy in the model output. Traffic volumes used in the model were based on LOS C volumes for the WDC as provided by UDOT, with traffic on the WDC operating at 65 mph.

Overall, noise levels with the Refined Selected Alternative would range from 57 to 74 dBA compared to the existing conditions of 45 dBA.

6 Expected Impacts with the Refined Selected Alternative

With the Refined Selected Alternative, all 342 receptors (representing 341 dwelling units and one recreation site) would have traffic noise impacts; that is, they would approach, exceed, or substantially exceed (≥ 10-dBA increase over existing noise levels) the NAC as defined above in Table 2. The locations of the receptors that would approach, exceed, or substantially exceed the NAC are shown in Figure 4 through Figure 6, Build Scenario Noise Receptor Map.

7 Summary of Existing and Expected Noise Levels

Table 4 summarizes the modeled existing and Refined Selected Alternative build scenario noise levels at receptors in the noise study area. Shaded cells indicate impacts with the Refined Selected Alternative. For receptor locations, see Figure 1 through Figure 3, Existing Noise Receptor Map, and Figure 4 through Figure 6, Build Scenario Noise Receptor Map.

Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N1007	B	66	45	No	61	No	**Yes**
N1008	B	66	45	No	63	No	**Yes**
N1009	B	66	45	No	64	No	**Yes**
N1010	B	66	45	No	65	No	**Yes**
N1017	B	66	45	No	61	No	**Yes**
N1018	B	66	45	No	62	No	**Yes**
N1019	B	66	45	No	63	No	**Yes**
N1020	B	66	45	No	64	No	**Yes**
N1021	B	66	45	No	64	No	**Yes**
N1022	B	66	45	No	63	No	**Yes**
N1023	B	66	45	No	62	No	**Yes**
N1044	B	66	45	No	60	No	**Yes**
N1046	B	66	45	No	61	No	**Yes**
N1047	B	66	45	No	61	No	**Yes**
N1048	B	66	45	No	62	No	**Yes**
N1049	B	66	45	No	63	No	**Yes**
N1050	B	66	45	No	63	No	**Yes**
N1051	B	66	45	No	63	No	**Yes**
N1052	B	66	45	No	63	No	**Yes**
N1053	B	66	45	No	60	No	**Yes**
N1054	B	66	45	No	59	No	**Yes**
N1055	B	66	45	No	59	No	**Yes**
N1056	B	66	45	No	59	No	**Yes**
N1057	B	66	45	No	59	No	**Yes**
N1058	B	66	45	No	58	No	**Yes**
N1059	B	66	45	No	58	No	**Yes**
N1060	B	66	45	No	59	No	**Yes**
N1061	B	66	45	No	61	No	**Yes**
N1069	B	66	45	No	62	No	**Yes**
N1085	B	66	45	No	62	No	**Yes**
N1089	B	66	45	No	61	No	**Yes**
N1090	B	66	45	No	62	No	**Yes**
N1091	B	66	45	No	64	No	**Yes**
N1092	B	66	45	No	63	No	**Yes**
N1093	B	66	45	No	62	No	**Yes**
N1094	B	66	45	No	64	No	**Yes**
N1095	B	66	45	No	63	No	**Yes**

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Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N1096	B	66	45	No	62	No	**Yes**
N1097	B	66	45	No	65	No	**Yes**
N1098	B	66	45	No	64	No	**Yes**
N1099	B	66	45	No	63	No	**Yes**
N1123	B	66	45	No	71	**Yes**	**Yes**
N1124	B	66	45	No	68	**Yes**	**Yes**
N1125	B	66	45	No	66	**Yes**	**Yes**
N1126	B	66	45	No	65	No	**Yes**
N1127	B	66	45	No	71	**Yes**	**Yes**
N1128	B	66	45	No	68	**Yes**	**Yes**
N1129	B	66	45	No	67	**Yes**	**Yes**
N1130	B	66	45	No	67	**Yes**	**Yes**
N1131	B	66	45	No	68	**Yes**	**Yes**
N1132	B	66	45	No	71	**Yes**	**Yes**
N1133	B	66	45	No	72	**Yes**	**Yes**
N1134	B	66	45	No	68	**Yes**	**Yes**
N1135	B	66	45	No	67	**Yes**	**Yes**
N1136	B	66	45	No	72	**Yes**	**Yes**
N1137	B	66	45	No	69	**Yes**	**Yes**
N1138	B	66	45	No	67	**Yes**	**Yes**
N1139	B	66	45	No	72	**Yes**	**Yes**
N1140	B	66	45	No	69	**Yes**	**Yes**
N1141	B	66	45	No	68	**Yes**	**Yes**
N1142	B	66	45	No	72	**Yes**	**Yes**
N1143	B	66	45	No	69	**Yes**	**Yes**
N1144	B	66	45	No	68	**Yes**	**Yes**
N1145	B	66	45	No	73	**Yes**	**Yes**
N1146	B	66	45	No	71	**Yes**	**Yes**
N1147	B	66	45	No	70	**Yes**	**Yes**
N1148	B	66	45	No	68	**Yes**	**Yes**
N1149	B	66	45	No	67	**Yes**	**Yes**
N1150	B	66	45	No	67	**Yes**	**Yes**
N1151	B	66	45	No	73	**Yes**	**Yes**
N1152	B	66	45	No	71	**Yes**	**Yes**
N1153	B	66	45	No	69	**Yes**	**Yes**
N1154	B	66	45	No	69	**Yes**	**Yes**
N1155	B	66	45	No	67	**Yes**	**Yes**
N1156	B	66	45	No	67	**Yes**	**Yes**
N1157	B	66	45	No	64	No	**Yes**
N1158	B	66	45	No	64	No	**Yes**
N1159	B	66	45	No	62	No	**Yes**
N1160	B	66	45	No	62	No	**Yes**
N1161	B	66	45	No	61	No	**Yes**
N1162	B	66	45	No	61	No	**Yes**
N1163	B	66	45	No	63	No	**Yes**

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Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N1164	B	66	45	No	63	No	**Yes**
N1165	B	66	45	No	62	No	**Yes**
N1166	B	66	45	No	61	No	**Yes**
N1167	B	66	45	No	62	No	**Yes**
N1168	B	66	45	No	61	No	**Yes**
N1169	B	66	45	No	63	No	**Yes**
N1170	B	66	45	No	62	No	**Yes**
N1171	B	66	45	No	61	No	**Yes**
N1172	B	66	45	No	64	No	**Yes**
N1173	B	66	45	No	62	No	**Yes**
N1174	B	66	45	No	61	No	**Yes**
N1175	B	66	45	No	63	No	**Yes**
N1176	B	66	45	No	62	No	**Yes**
N1177	B	66	45	No	61	No	**Yes**
N1178	B	66	45	No	61	No	**Yes**
N1180	B	66	45	No	63	No	**Yes**
N1181	B	66	45	No	62	No	**Yes**
N1182	B	66	45	No	61	No	**Yes**
N1183	B	66	45	No	63	No	**Yes**
N1184	B	66	45	No	62	No	**Yes**
N1185	B	66	45	No	61	No	**Yes**
N1186	B	66	45	No	62	No	**Yes**
N1187	B	66	45	No	61	No	**Yes**
N1188	B	66	45	No	62	No	**Yes**
N1189	B	66	45	No	68	**Yes**	**Yes**
N1190	B	66	45	No	67	**Yes**	**Yes**
N1191	B	66	45	No	65	No	**Yes**
N1192	B	66	45	No	65	No	**Yes**
N1193	B	66	45	No	66	**Yes**	**Yes**
N1194	B	66	45	No	68	**Yes**	**Yes**
N1195	B	66	45	No	66	**Yes**	**Yes**
N1196	B	66	45	No	64	No	**Yes**
N1197	B	66	45	No	64	No	**Yes**
N1200	B	66	45	No	57	No	**Yes**
N1201	B	66	45	No	58	No	**Yes**
N1204	B	66	45	No	60	No	**Yes**
N1205	B	66	45	No	60	No	**Yes**
N1206	B	66	45	No	60	No	**Yes**
N1207	B	66	45	No	60	No	**Yes**
N1208	B	66	45	No	60	No	**Yes**
N1209	B	66	45	No	61	No	**Yes**
N1210	B	66	45	No	59	No	**Yes**
N1211	B	66	45	No	59	No	**Yes**
N1212	B	66	45	No	58	No	**Yes**

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Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N1213	B	66	45	No	58	No	**Yes**
N1214	B	66	45	No	58	No	**Yes**
N1215	B	66	45	No	58	No	**Yes**
N1216	B	66	45	No	59	No	**Yes**
N1217	B	66	45	No	58	No	**Yes**
N1218	B	66	45	No	57	No	**Yes**
N1219	B	66	45	No	57	No	**Yes**
N1220	B	66	45	No	60	No	**Yes**
N1222	B	66	45	No	59	No	**Yes**
N1223	B	66	45	No	59	No	**Yes**
N1224	B	66	45	No	61	No	**Yes**
N1225	B	66	45	No	60	No	**Yes**
N1226	B	66	45	No	60	No	**Yes**
N1227	B	66	45	No	61	No	**Yes**
N1228	B	66	45	No	60	No	**Yes**
N1229	B	66	45	No	60	No	**Yes**
N1230	B	66	45	No	60	No	**Yes**
N1231	B	66	45	No	59	No	**Yes**
N1232	B	66	45	No	59	No	**Yes**
N1235	B	66	45	No	63	No	**Yes**
N1236	B	66	45	No	62	No	**Yes**
N1237	B	66	45	No	62	No	**Yes**
N1238	B	66	45	No	63	No	**Yes**
N1239	B	66	45	No	62	No	**Yes**
N1240	B	66	45	No	62	No	**Yes**
N1241	B	66	45	No	65	No	**Yes**
N1242	B	66	45	No	64	No	**Yes**
N1243	B	66	45	No	64	No	**Yes**
N1244	B	66	45	No	65	No	**Yes**
N1245	B	66	45	No	65	No	**Yes**
N1246	B	66	45	No	64	No	**Yes**
N1247	B	66	45	No	68	**Yes**	**Yes**
N1248	B	66	45	No	67	**Yes**	**Yes**
N1249	B	66	45	No	66	**Yes**	**Yes**
N1250	B	66	45	No	66	**Yes**	**Yes**
N1251	B	66	45	No	67	**Yes**	**Yes**
N1252	B	66	45	No	69	**Yes**	**Yes**
N1253	B	66	45	No	69	**Yes**	**Yes**
N1254	B	66	45	No	65	No	**Yes**
N1255	B	66	45	No	64	No	**Yes**
N1256	B	66	45	No	64	No	**Yes**
N1257	B	66	45	No	65	No	**Yes**
N1258	B	66	45	No	68	**Yes**	**Yes**
N1259	B	66	45	No	68	**Yes**	**Yes**

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Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N1260	B	66	45	No	65	No	**Yes**
N1261	B	66	45	No	63	No	**Yes**
N1262	B	66	45	No	62	No	**Yes**
N1263	B	66	45	No	64	No	**Yes**
N1264	B	66	45	No	68	**Yes**	**Yes**
N1265	B	66	45	No	68	**Yes**	**Yes**
N1266	B	66	45	No	64	No	**Yes**
N1267	B	66	45	No	62	No	**Yes**
N1268	B	66	45	No	62	No	**Yes**
N1269	B	66	45	No	64	No	**Yes**
N1270	B	66	45	No	68	**Yes**	**Yes**
N1274	B	66	45	No	59	No	**Yes**
N1275	B	66	45	No	59	No	**Yes**
N1276	B	66	45	No	60	No	**Yes**
N1277	B	66	45	No	60	No	**Yes**
N1278	B	66	45	No	59	No	**Yes**
N1279	B	66	45	No	59	No	**Yes**
N1280	B	66	45	No	59	No	**Yes**
N1281	B	66	45	No	59	No	**Yes**
N1282	B	66	45	No	59	No	**Yes**
N1283	B	66	45	No	59	No	**Yes**
N1284	B	66	45	No	62	No	**Yes**
N1285	B	66	45	No	61	No	**Yes**
N1286	B	66	45	No	61	No	**Yes**
N1287	B	66	45	No	60	No	**Yes**
N1288	B	66	45	No	60	No	**Yes**
N1289	B	66	45	No	60	No	**Yes**
N1292	B	66	45	No	62	No	**Yes**
N1293	B	66	45	No	61	No	**Yes**
N1294	B	66	45	No	61	No	**Yes**
N1295	B	66	45	No	60	No	**Yes**
N1296	B	66	45	No	60	No	**Yes**
N1297	B	66	45	No	60	No	**Yes**
N1301	B	66	45	No	60	No	**Yes**
N1302	B	66	45	No	63	No	**Yes**
N1304	B	66	45	No	63	No	**Yes**
N1305	B	66	45	No	62	No	**Yes**
N1306	B	66	45	No	62	No	**Yes**
N1307	B	66	45	No	61	No	**Yes**
N1309	B	66	45	No	61	No	**Yes**
N1310	B	66	45	No	61	No	**Yes**
N1311	B	66	45	No	61	No	**Yes**
N1312	B	66	45	No	62	No	**Yes**
N1313	B	66	45	No	62	No	**Yes**

(*continued on next page*)

Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N1314	B	66	45	No	63	No	**Yes**
N1315	B	66	45	No	63	No	**Yes**
N1444	B	66	45	No	NA	NA	NA
N1445	B	66	45	No	64	No	**Yes**
N1446	B	66	45	No	NA	NA	NA
N1447	B	66	45	No	NA	NA	NA
N596	B	66	45	No	60	No	**Yes**
N597	B	66	45	No	62	No	**Yes**
N598	B	66	45	No	62	No	**Yes**
N599	B	66	45	No	63	No	**Yes**
N603	B	66	45	No	65	No	**Yes**
N604	B	66	45	No	64	No	**Yes**
N605	B	66	45	No	65	No	**Yes**
N606	B	66	45	No	62	No	**Yes**
N607	B	66	45	No	65	No	**Yes**
N608	B	66	45	No	66	**Yes**	**Yes**
N609	B	66	45	No	62	No	**Yes**
N610	B	66	45	No	61	No	**Yes**
N611	B	66	45	No	60	No	**Yes**
N616	B	66	45	No	64	No	**Yes**
N617	B	66	45	No	64	No	**Yes**
N618	B	66	45	No	63	No	**Yes**
N619	B	66	45	No	63	No	**Yes**
N620	B	66	45	No	62	No	**Yes**
N621	B	66	45	No	63	No	**Yes**
N622	B	66	45	No	64	No	**Yes**
N623	B	66	45	No	64	No	**Yes**
N624	B	66	45	No	67	**Yes**	**Yes**
N625	B	66	45	No	71	**Yes**	**Yes**
N626	B	66	45	No	68	**Yes**	**Yes**
N627	B	66	45	No	68	**Yes**	**Yes**
N628	B	66	45	No	66	**Yes**	**Yes**
N629	B	66	45	No	63	No	**Yes**
N630	B	66	45	No	62	No	**Yes**
N631	B	66	45	No	62	No	**Yes**
N632	B	66	45	No	61	No	**Yes**
N633	B	66	45	No	61	No	**Yes**
N649	B	66	45	No	61	No	**Yes**
N667	B	66	45	No	62	No	**Yes**
N863	B	66	45	No	72	**Yes**	**Yes**
N864	B	66	45	No	72	**Yes**	**Yes**
N865	B	66	45	No	72	**Yes**	**Yes**
N866	B	66	45	No	73	**Yes**	**Yes**
N867	B	66	45	No	72	**Yes**	**Yes**

(*continued on next page*)

Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N868	C	66	45	No	69	**Yes**	**Yes**
N869	B	66	45	No	72	**Yes**	**Yes**
N870	B	66	45	No	73	**Yes**	**Yes**
N871	B	66	45	No	72	**Yes**	**Yes**
N872	B	66	45	No	72	**Yes**	**Yes**
N873	B	66	45	No	73	**Yes**	**Yes**
N874	B	66	45	No	72	**Yes**	**Yes**
N875	B	66	45	No	72	**Yes**	**Yes**
N876	B	66	45	No	72	**Yes**	**Yes**
N877	B	66	45	No	72	**Yes**	**Yes**
N878	B	66	45	No	72	**Yes**	**Yes**
N879	B	66	45	No	72	**Yes**	**Yes**
N880	B	66	45	No	72	**Yes**	**Yes**
N881	B	66	45	No	72	**Yes**	**Yes**
N882	B	66	45	No	72	**Yes**	**Yes**
N883	B	66	45	No	71	**Yes**	**Yes**
N884	B	66	45	No	72	**Yes**	**Yes**
N885	B	66	45	No	71	**Yes**	**Yes**
N886	B	66	45	No	70	**Yes**	**Yes**
N892	B	66	45	No	58	No	**Yes**
N893	B	66	45	No	59	No	**Yes**
N894	B	66	45	No	61	No	**Yes**
N895	B	66	45	No	63	No	**Yes**
N896	B	66	45	No	66	**Yes**	**Yes**
N897	B	66	45	No	70	**Yes**	**Yes**
N902	B	66	45	No	58	No	**Yes**
N903	B	66	45	No	58	No	**Yes**
N904	B	66	45	No	60	No	**Yes**
N905	B	66	45	No	61	No	**Yes**
N906	B	66	45	No	66	**Yes**	**Yes**
N907	B	66	45	No	71	**Yes**	**Yes**
N908	B	66	45	No	74	**Yes**	**Yes**
N909	B	66	45	No	73	**Yes**	**Yes**
N910	B	66	45	No	73	**Yes**	**Yes**
N911	B	66	45	No	73	**Yes**	**Yes**
N912	B	66	45	No	73	**Yes**	**Yes**
N913	B	66	45	No	73	**Yes**	**Yes**
N914	B	66	45	No	73	**Yes**	**Yes**
N915	B	66	45	No	72	**Yes**	**Yes**
N916	B	66	45	No	73	**Yes**	**Yes**
N917	B	66	45	No	73	**Yes**	**Yes**
N918	B	66	45	No	73	**Yes**	**Yes**
N919	B	66	45	No	73	**Yes**	**Yes**
N920	B	66	45	No	73	**Yes**	**Yes**

(*continued on next page*)

Table 4. Modeled Existing and Refined Selected Alternative Noise Levels in the Noise Study Area

Receptor	Activity Category	UDOT NAC $L_{eq}(h)$	Existing		With Refined Selected Alternative		
			Existing Noise Levels (dBA)	Existing Impact?	Refined Selected Alternative Noise Levels (dBA)	≥ UDOT NAC?	≥ 10 dBA Increase over Existing Noise Level?
N921	B	66	45	No	73	**Yes**	**Yes**
N922	B	66	45	No	72	**Yes**	**Yes**
N923	B	66	45	No	68	**Yes**	**Yes**
N924	B	66	45	No	65	No	**Yes**
N925	B	66	45	No	63	No	**Yes**
N926	B	66	45	No	60	No	**Yes**
N927	B	66	45	No	59	No	**Yes**
N931	B	66	45	No	61	No	**Yes**
N932	B	66	45	No	61	No	**Yes**
N933	B	66	45	No	62	No	**Yes**
N934	B	66	45	No	62	No	**Yes**
N935	B	66	45	No	63	No	**Yes**
N936	B	66	45	No	63	No	**Yes**
N938	B	66	45	No	60	No	**Yes**
N939	B	66	45	No	61	No	**Yes**
N940	B	66	45	No	61	No	**Yes**
N941	B	66	45	No	62	No	**Yes**
N942	B	66	45	No	62	No	**Yes**
N943	B	66	45	No	62	No	**Yes**
N944	B	66	45	No	63	No	**Yes**
N945	B	66	45	No	63	No	**Yes**
N946	B	66	45	No	64	No	**Yes**
N949	B	66	45	No	60	No	**Yes**
N950	B	66	45	No	61	No	**Yes**
N951	B	66	45	No	62	No	**Yes**
N952	B	66	45	No	63	No	**Yes**
N953	B	66	45	No	64	No	**Yes**
N954	B	66	45	No	63	No	**Yes**
N955	B	66	45	No	62	No	**Yes**
N956	B	66	45	No	61	No	**Yes**
N977	B	66	45	No	60	No	**Yes**
N978	B	66	45	No	61	No	**Yes**
N979	B	66	45	No	62	No	**Yes**
N980	B	66	45	No	63	No	**Yes**
N981	B	66	45	No	64	No	**Yes**
N982	B	66	45	No	64	No	**Yes**
N983	B	66	45	No	63	No	**Yes**
N984	B	66	45	No	62	No	**Yes**
N985	B	66	45	No	61	No	**Yes**
N992	B	66	45	No	65	No	**Yes**
N993	B	66	45	No	63	No	**Yes**
N994	B	66	45	No	62	No	**Yes**
N995	B	66	45	No	61	No	**Yes**

Shaded cells indicate impacts with the Refined Selected Alternative.

Figure 4. Build Scenario Noise Receptor Map (1 of 3)

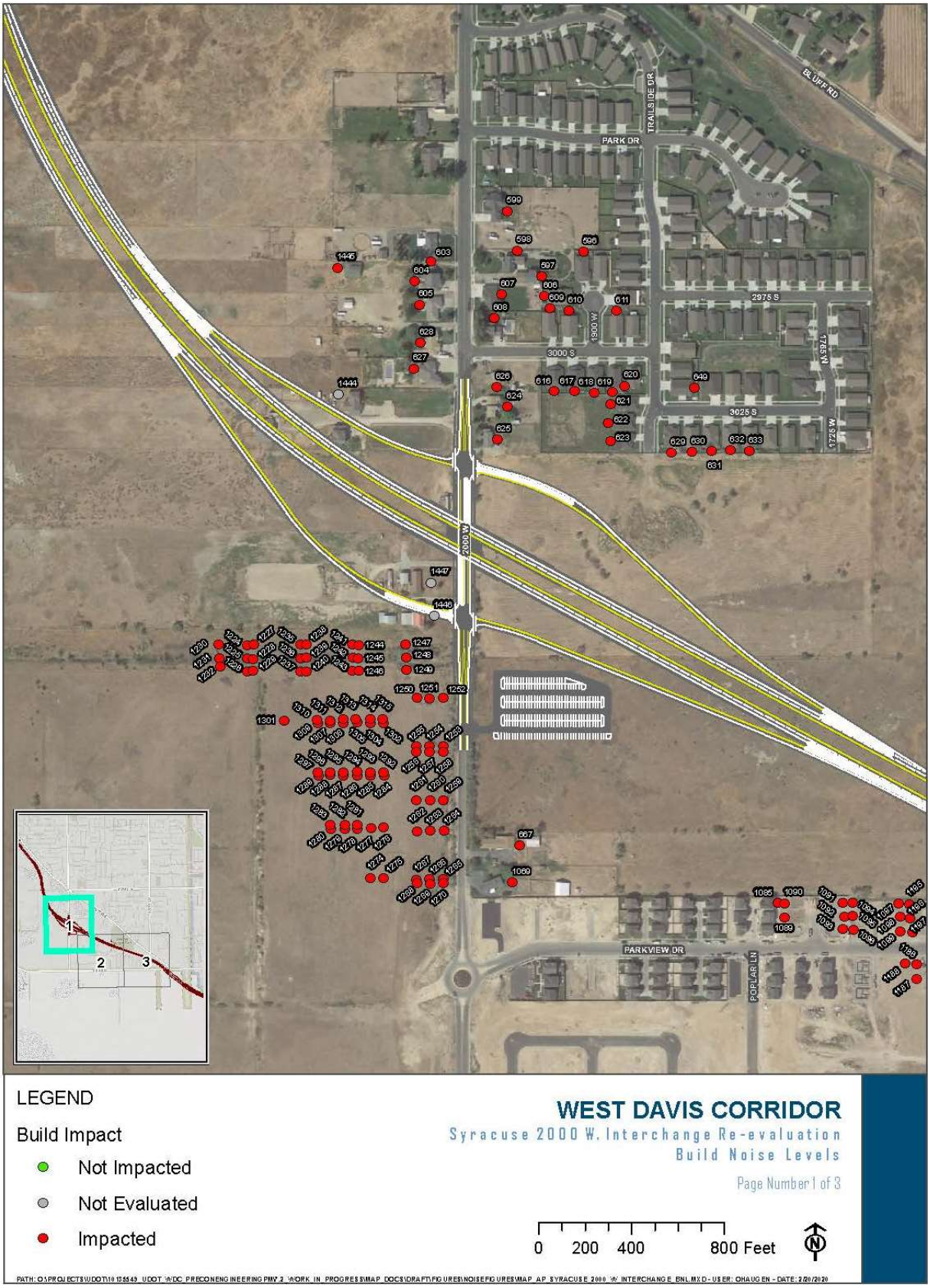
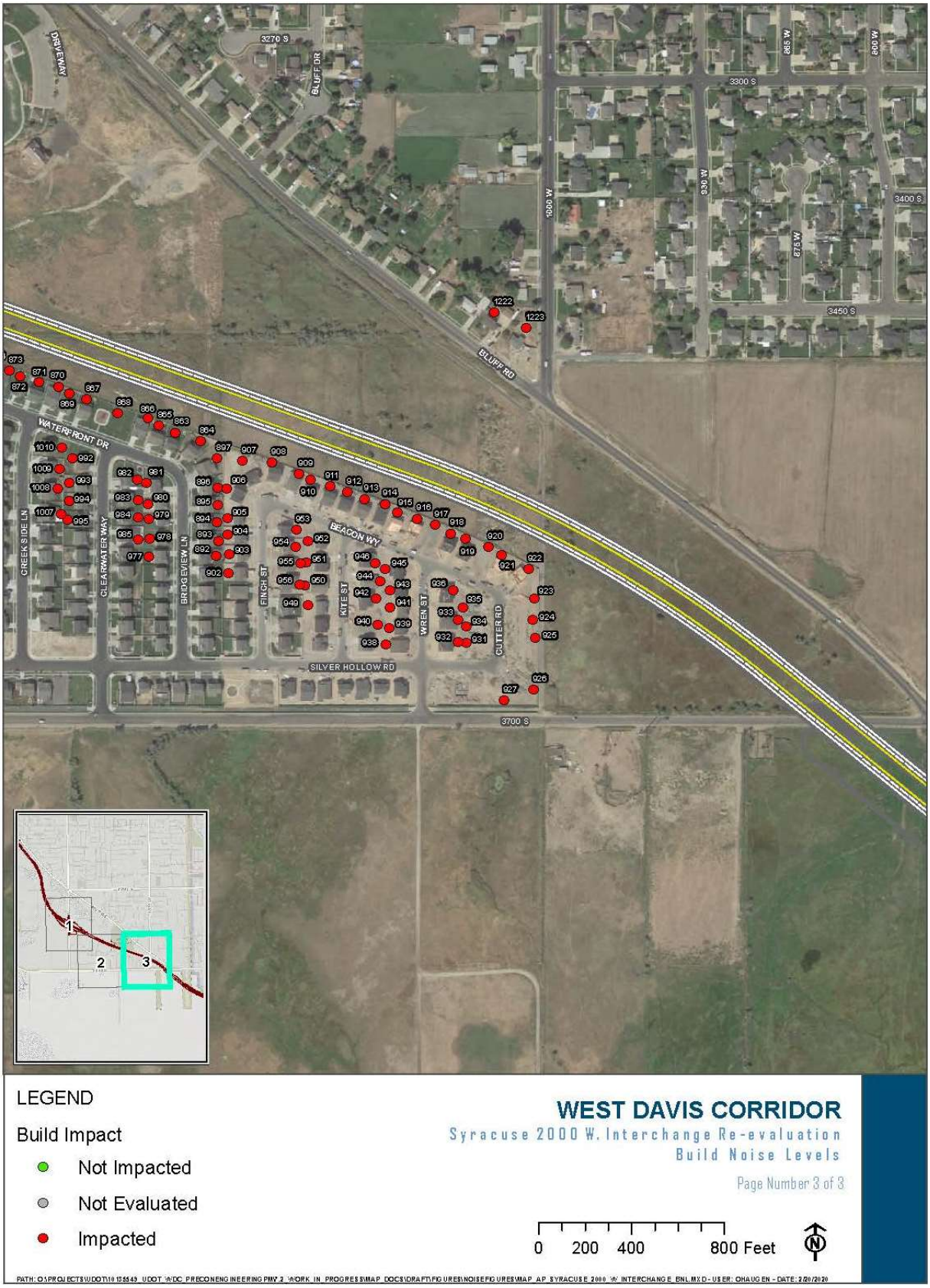


Figure 5. Build Scenario Noise Receptor Map (2 of 3)

Figure 6. Build Scenario Noise Receptor Map (3 of 3)



8 Noise Abatement Methodology

This section discusses UDOT's methodology for evaluating noise-abatement mitigation measures for the traffic noise impacts identified in Section 6, Expected Impacts with the Refined Selected Alternative.

For a noise wall to be effective, it must be high enough and long enough to block the view of the noise source (that is, traffic on the roadway) from the receptor's line of sight. FHWA's *Highway Traffic Noise: Analysis and Abatement Guidance* (FHWA 2011) states that, as a general rule of thumb, the noise barrier should extend 4 times as far in each direction as the distance from the receptor to the barrier. For example, if the receptor is 50 feet from the proposed noise barrier, the barrier needs to extend at least 200 feet on either side of the receptor in order to shield the receptor from noise traveling past the ends of the barrier.

Gaps in a noise wall cause "noise leaks," which reduce the effectiveness of the wall at homes near the gap. In addition, the effectiveness of noise walls decreases with increasing distance from the wall. For example, a residence that is 300 feet from a noise wall might experience noise levels that exceed the residential NAC. However, the noise wall might be ineffective in reducing noise levels by 7 dBA or more at that distance, and, therefore, a noise barrier might not be warranted according to UDOT's Noise Abatement Policy. The goal of noise abatement is to substantially reduce noise, which might or might not result in noise levels below the residential NAC.

The two primary criteria to consider when evaluating noise-abatement measures are feasibility and reasonableness. Noise abatement would be provided by UDOT only if UDOT determines that noise-abatement measures are *both* feasible and reasonable.

8.1 Feasibility and Reasonableness Factors

8.1.1 Feasibility Factors

The feasibility of noise-abatement measures deals primarily with construction and engineering considerations such as safety, location of cross streets, sight distance, and access to adjacent properties, among other considerations. Under UDOT's Noise Abatement Policy, a noise barrier must be considered "acoustically feasible"—that is, the barrier must reduce noise by at least 5 dBA for at least 50% of front-row receptors.

What are feasibility factors?

The feasibility of noise-abatement measures deals primarily construction and engineering considerations.

If a noise-abatement measure is determined by UDOT to be acoustically feasible, then the abatement measure will be evaluated to determine whether its construction is reasonable. If a noise-abatement measure is determined by UDOT to be not feasible, it will not be considered any further.

8.1.2 Reasonableness Factors

Under UDOT's Noise Abatement Policy, reasonableness factors must be collectively achieved in order for a noise-abatement measure to be considered "reasonable." All three reasonableness factors described below must be met in order for a noise barrier to be considered reasonable.

What are reasonableness factors?

Reasonableness factors are the noise-abatement design goal, cost-effectiveness, and the viewpoints of property owners and residents.

- ***Noise-abatement Design Goal.*** Every reasonable effort should be made to achieve substantial reductions in noise. UDOT defines the minimum noise reduction (design goal) from proposed abatement measures to be 7 dBA or greater for at least 35% of front-row receptors. No abatement measure will be considered reasonable if the noise-abatement design goal cannot be achieved.
- ***Cost-effectiveness.*** The cost of a noise-abatement measure must be considered reasonable in order for it to be included in a project. Noise-abatement costs are determined by multiplying a fixed unit cost per square foot by the height and length of the barrier.

  For residential receptors, cost-effectiveness is based on the cost of the abatement measure (for example, a noise wall) divided by the number of benefited receptors (the total number of dwelling units at which noise is reduced by a minimum of 5 dBA as a result of the abatement measure).

  Currently, the maximum cost used to determine the reasonableness of a noise-abatement measure is $30,000 per benefiting residence (Activity Category B) based on a unit cost of $20 per square foot of barrier, and $360 per lineal foot for Activity Categories A, C, D, or E.
- ***Viewpoints of Property Owners and Residents.*** If a noise-abatement measure is both feasible and cost-effective, UDOT will also consider the viewpoints of property owners and residents to determine whether the noise-abatement measures are desired. Balloting will be conducted for those noise-abatement measures that both meet the noise-abatement design goal and are cost-effective consistent with the procedures described in UDOT's Noise Abatement Policy.

The noise walls considered for the Refined Selected Alternative are discussed below. UDOT evaluated noise walls for six locations along the WDC where noise impacts would occur with the Refined Selected Alternative. UDOT also modeled three combinations of walls to see if the combined walls would be feasible and reasonable. One wall, Barrier 5, in this section of the WDC was found to be both feasible and reasonable.

8.1.3 Noise Wall Evaluations

In this section, noise walls evaluations are summarized for locations where there would be impacts to noise receptors as defined in Sections 6 and 7.

The locations of the evaluated noise walls are shown in Figure 7 through Figure 9, Build Scenario Noise Walls.

Figure 7. Build Scenario Noise Walls (1 of 3)

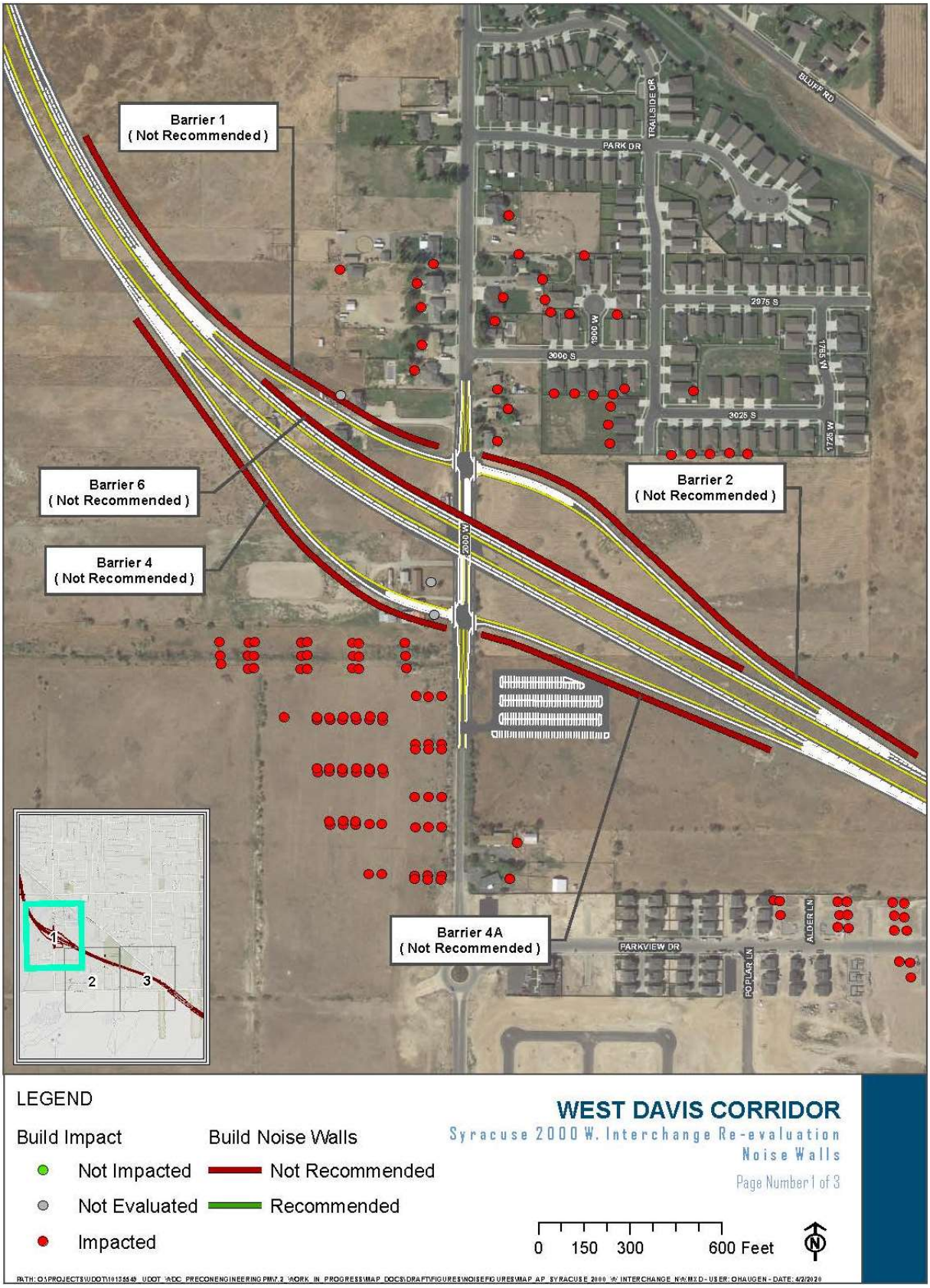


Figure 8. Build Scenario Noise Walls (2 of 3)

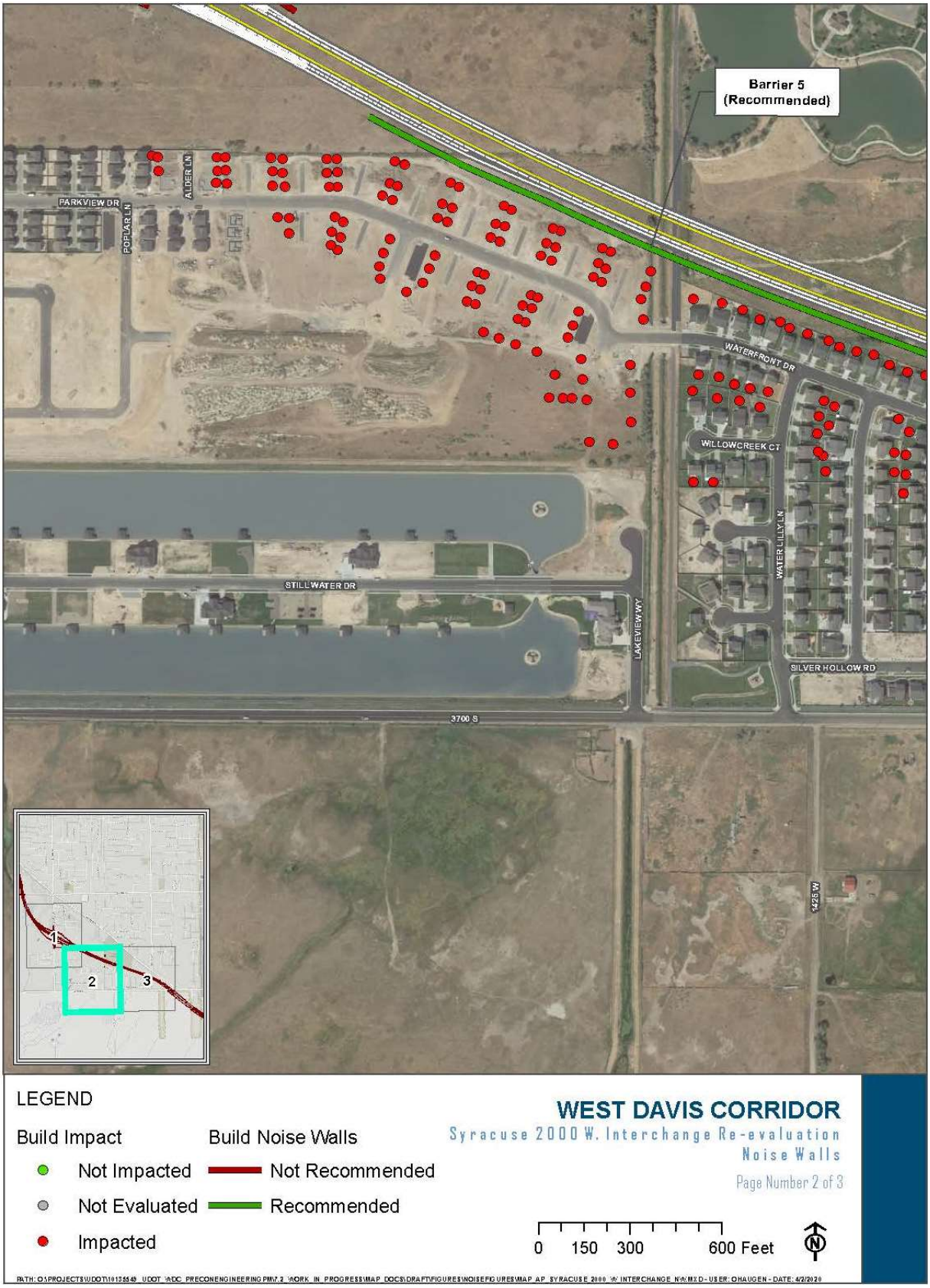
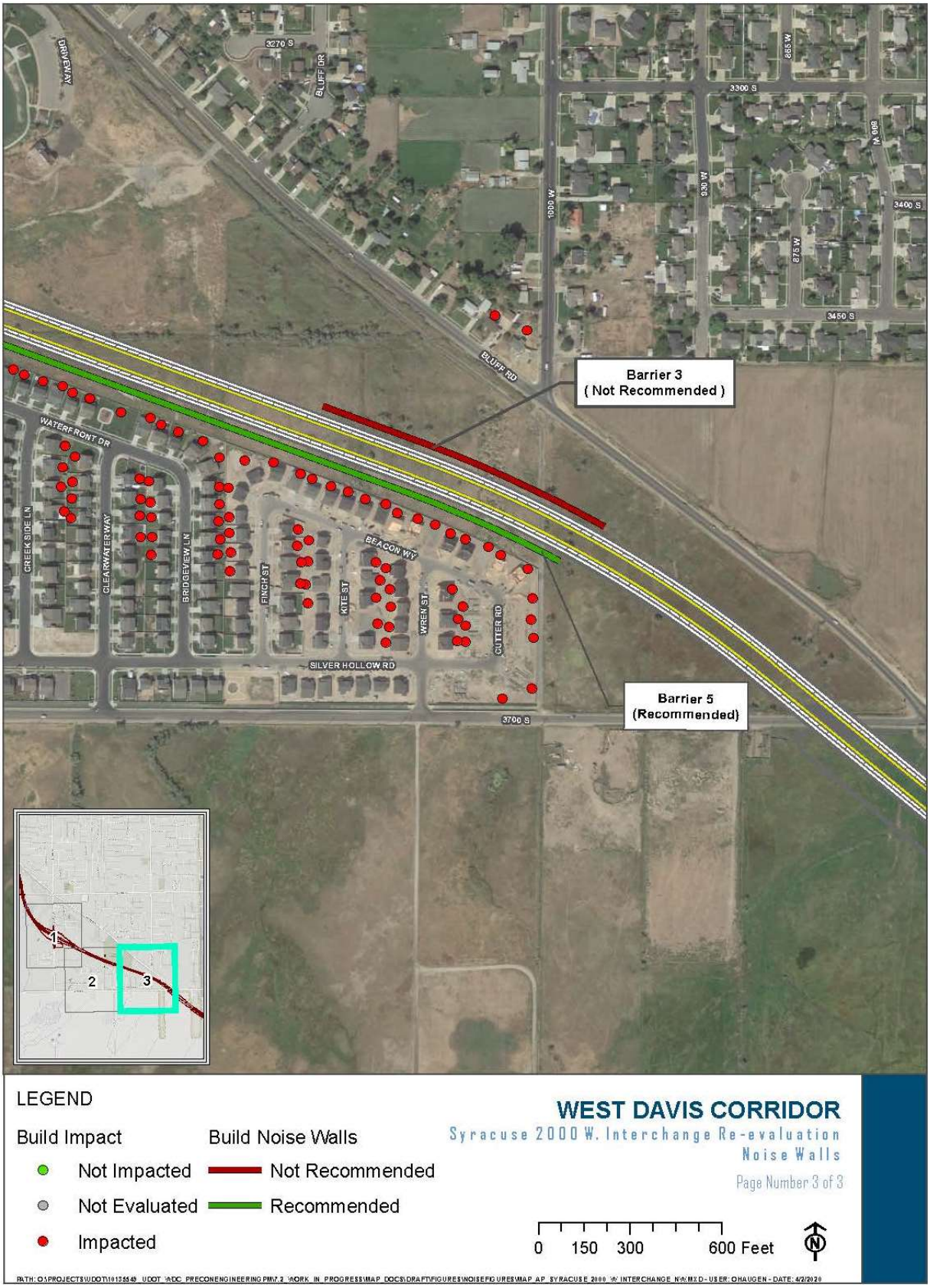


Figure 9. Build Scenario Noise Walls (3 of 3)



Barrier 1

A noise wall from 2300 West to 2000 West was evaluated where noise impacts are expected to a total of 6 residential receptors. There are 2 front-row residential receptors in this area. The noise wall would be located on the northern WDC right-of-way line near the on ramp from 2000 West to WDC and would be about 1,577 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls).

As summarized in Table 5, UDOT evaluated a wall 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 5. Noise-abatement Analysis for Barrier 1

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
17	0%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The noise wall evaluated does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 2

A noise wall from 2000 West to 1700 West was evaluated where noise impacts are expected to a total of 27 residential receptors. There are 7 front-row residential receptors in this area. The noise wall would be located on the northern WDC right-of-way line near the off ramp from WDC to 2000 West and would be about 1,746 feet long (see Figure 7 through Figure 9. Build Scenario Noise Walls (3 of 3), Build Scenario Noise Walls).

As summarized in Table 6, UDOT evaluated a wall 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 6. Noise-abatement Analysis for Barrier 2

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
17	0%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The noise wall evaluated does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 3

A noise wall from 1100 West to 1000 West was evaluated where noise impacts are expected to a total of 2 residential receptors. There are 2 front-row residential receptors in this area. The noise wall would be located near the clear zone for northbound WDC traffic and would be about 1,000 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls).

As summarized in Table 7, UDOT evaluated a wall 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 7. Noise-abatement Analysis for Barrier 3

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
17	0%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The noise wall evaluated does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 4

A noise wall from 2300 West to 2000 West was evaluated where noise impacts are expected to a total of 80 residential receptors. There are 8 front-row residential receptors in this area. The noise wall would be located on the southern WDC right-of-way line near the off ramp from WDC to 2000 West and would be about 1,471 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls).

As summarized in Table 8, UDOT evaluated a wall 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 8. Noise-abatement Analysis for Barrier 4

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
17	13%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The noise wall evaluated does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 5

A noise wall from about 1600 West to 1000 West was evaluated where noise impacts are expected to a total of 225 receptors (224 residential receptors and 1 recreational receptor). There are 60 front-row receptors in this area (59 residential receptors and 1 recreational receptor). The noise wall would be located near the clear zone for southbound WDC traffic and would be about 3,896 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls).

As summarized in Table 8, UDOT evaluated walls ranging from 12 to 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 9. Noise-abatement Analysis for Barrier 5

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
12	70%	Yes	10%	No	NA	NA	NA	**No**
13	82%	Yes	50%	Yes	$1,012,960	$1,470,000	Yes	**Yes**
14	87%	Yes	65%	Yes	$1,090,880	$1,800,000	Yes	**Yes**
15	87%	Yes	80%	Yes	$1,168,800	$2,040,000	Yes	**Yes**
16	87%	Yes	83%	Yes	$1,246,720	$2,550,000	Yes	**Yes**
17	87%	Yes	83%	Yes	$1,324,640	$3,120,000	Yes	**Yes**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

A 13-foot-high, 3,896-foot-long noise wall meets the feasibility and reasonableness criteria in UDOT's Noise Abatement Policy; therefore, a wall at this location is recommended.

Barrier 6

A noise wall from 2100 West to 1900 West was evaluated where noise impacts are expected to a total of 33 residential receptors. There are 9 front-row residential receptors in this area. The noise wall would be located just off the shoulder of northbound WDC traffic and would be about 1,838 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls).

As summarized in Table 10, UDOT evaluated a wall 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis). UDOT's Noise Abatement Policy limits the height of noise walls on structures to 10 feet, so the portion of Barrier 6 that is on the WDC structure crossing over 2000 West was only modeled at 10 feet high.

Table 10. Noise-abatement Analysis for Barrier 6

	Feasibility		Reasonable					
Barrier Height (feet)	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	Is Barrier Feasible and Reasonable?
17	0%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The noise wall evaluated does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 1 and 2 Combination

The combination of Barriers 1 and 2 (previously described) was evaluated where noise impacts are expected to a total of 33 residential receptors on the north side of WDC near 2000 West. There are 9 front-row residential receptors in this area. The two noise walls would be located on the northern WDC right-of-way line near the off ramp from WDC to 2000 West and on ramp from 2000 West to WDC and would be a total of about 4,055 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls). The distance of these combined walls is longer than the sum of the individual walls due to Barriers 1 and 2 having additional length added to the north end of Barrier 1 and south end of Barrier 2 with the combination evaluation to try to provide as much noise abatement as possible.

As summarized in Table 11, UDOT evaluated both walls at 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 11. Noise-abatement Analysis for Barrier 1 and 2 Combination

	Feasibility		Reasonable					
Barrier Height (feet)	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	Is Barrier Feasible and Reasonable?
17	0%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The combination of Barrier 1 and Barrier 2 does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 1, 2, and 6 Combination

The combination of Barriers 1, 2, and 6 (previously described) was evaluated where noise impacts are expected to a total of 33 residential receptors on the north side of WDC near 2000 West. There are 9 front-row residential receptors in this area. The three noise walls would be located on the north side of WDC and the WDC on and off ramps to 2000 West and would be a total of about 5,893 feet long (see Figure 7 through Figure 9, Build Scenario Noise Walls). The distance of these combined walls is longer than the sum of the individual walls due to Barriers 1 and 2 having additional length added to the north end of Barrier 1 and south end of Barrier 2 with the combination evaluation to try to provide as much noise abatement as possible.

As summarized in Table 11, UDOT evaluated all three walls at 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis). UDOT's Noise Abatement Policy limits the height of noise walls on structures to 10 feet, so the portion of Barrier 6 that is on the WDC structure crossing over 2000 West was only modeled at 10 feet high.

Table 12. Noise-abatement Analysis for Barrier 1, 2 and 6 Combination

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
17	44%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The combination of Barrier 1, Barrier 2, and Barrier 6 does not meet UDOT's feasibility criteria; therefore, a wall at this location is not recommended.

Barrier 4 and 4A Combination

The combination of Barriers 4 and 4A was evaluated where noise impacts are expected to a total of 82 residential receptors south of WDC near the WDC crossing of 2000 West. There are 8 front-row residential receptors in this area. The noise walls would be located on the southern WDC right-of-way line near the off ramp from WDC to 2000 West and on ramp from 2000 West to WDC and would be about 2,743 feet long (see Figure 7 through **Error! Reference source not found.**, Build Scenario Noise Walls).

As summarized in Table 13, UDOT evaluated both walls at 17 feet high (for detailed information, see Appendix A, Noise Wall Analysis).

Table 13. Noise-abatement Analysis for Barrier 4 and 4A Combination

Barrier Height (feet)	Feasibility		Reasonable					Is Barrier Feasible and Reasonable?
	% Front-row with 5-dBA Reduction	Acoustically Feasible?[a]	% Front-row with 7-dBA Reduction	Noise Abatement Design Goal?[b]	Anticipated Cost	Allowable Cost	Cost-effective?[c]	
17	13%	No	NA	NA	NA	NA	NA	**No**

[a] 5-dBA reduction for at least 50% of front-row receptors.

[b] 7-dBA reduction for at least 35% of front-row receptors.

[c] Anticipated cost is less than allowable cost.

The combination of Barrier 4 and Barrier 4A does not meet UDOT's feasibility criteria; therefore, the combined Barrier 4 and Barrier 4A is not recommended.

9 Construction Noise

9.1 Construction Noise Activities

Table 14 shows the noise levels produced by various types of construction equipment. Properly maintained equipment will produce noise levels near the middle of the indicated ranges. The types of construction equipment used for this project will typically generate noise levels of 80 dBA to 90 dBA at a distance of 50 feet while the equipment is operating (EPA 1971; Gharabegian and others 1985; Toth 1979).

Construction equipment operations can vary from intermittent to fairly continuous with multiple pieces of equipment operating concurrently. Assuming that a bulldozer (85 dBA), backhoe (90 dBA), grader (90 dBA), and front-end loader (82 dBA) are operating concurrently in the same area, peak construction-period noise would generally be about 94 dBA at 50 feet from the construction site. Table 14 summarizes noise levels expected near an active construction site with the above equipment operating.

Table 14. Typical Noise Levels for Construction Equipment

Type of Equipment	Noise Level (dBA) at 50 feet
Bulldozer	85
Front loader	72 – 84
Jack hammer or rock drill	81 – 98
Crane with headache ball	75 – 87
Backhoe	72 – 93
Scraper and grader	80 – 93
Electrical generator	71 – 82
Concrete pump	81 – 83
Concrete vibrator	76
Concrete and dump trucks	83 – 90
Air compressor	74 – 87
Pile drivers (peaks)	95 – 106
Pneumatic tools	81 – 98
Roller (compactor)	73 – 75
Saws	73 – 82

Source: EPA 1971

Locations within about 1,900 feet of a construction site will experience occasional episodes of noise levels greater than 60 dBA. Areas within about 750 feet of a construction site will experience episodes of noise levels greater than 70 dBA. Such episodes of high noise levels associated with the proposed construction would not be continuous throughout the day and would generally be restricted to daytime hours.

Most construction activities associated with the Refined Selected Alternative would occur during daylight hours, which would minimize the number of noise impacts. Noise impacts

could occur when construction directly adjacent to residential, park, or recreational areas is necessary.

9.2 Construction Noise Mitigation

To reduce temporary noise impacts associated with construction, contractors will comply with all state and local regulations relating to construction noise.

The contractor will be required to follow UDOT Special Provision Section 00555M, *Prosecution and Progress*. The contractor will be required to conform to this specification to reduce the impact of construction noise on the surrounding community.

10 Information for Local Officials

Activity Categories F and G include lands that are not sensitive to traffic noise. There are no impact criteria for these land use types, so noise abatement is not required. However, for Activity Category G, an estimate of the distance to the approach criteria must be provided to local governments. This estimate will help local government officials promote compatibility between land development and the Refined Selected Alternative. Syracuse City is the local government that has land use jurisdiction in the noise study area.

Table 15 lists the distances from the edge of the roadway pavement to the locations where the worst-hour $L_{eq}(h)$ levels of 66 dBA and 71 dBA would occur.

Table 15. Contour Distance to Future Noise Levels

	Approximate Distance from Edge of Highway Pavement to Noise-level Contour (feet)	
Roadway	**66-dBA Noise-level Contour**	**71-dBA Noise-level Contour**
West Davis Corridor	205	105

11 Conclusions

The Refined Selected Alternative would generally increase noise levels by 19 dBA throughout the noise study area. All of the 342 receptors that were modeled for the Refined Selected Alternative build scenario would have traffic noise impacts from the Refined Selected Alternative. Section 11.1 below discusses the recommended noise walls in the noise study area that met the requirements of UDOT's Noise Abatement Policy.

As part of the final design phase, UDOT will conduct balloting consistent with the procedures in UDOT's 2017 Noise Abatement Policy.

11.1 Summary of Recommended Noise Walls

11.1.1 Barrier 5

The recommended noise wall would be 13 feet high and 3,896 feet long. It would extend from 1600 West to 1000 West on the south side of WDC (see Figure 7, Build Scenario Noise Walls).

12 References

[CEQ] Council on Environmental Quality

1970 Environmental Quality: The First Annual Report of the Council on Environmental Quality. U.S. Government Printing Office, Washington, DC.

[EPA] U.S. Environmental Protection Agency

1971 Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances. NTID300.1. Prepared by Bolt, Beranek, & Newman, Boston, Mass. U.S. Government Printing Office, Washington, DC.

[FHWA] Federal Highway Administration

2011 Highway Traffic Noise: Analysis and Abatement Guidance. FHWA-HEP-10-025. https://www.fhwa.dot.gov/environment/noise/regulations_and_guidance/analysis_and_abatement_guidance/revguidance.pdf. December.

2018 Noise Measurement Handbook: Final Report. FHWA-HEP-18-065. June 1.

Gharabegian, A., K.M. Cosgrove, J.R. Pehrson, and T.D. Trinh

1985 Forest Fire Fighters' Noise Exposure. *Noise Control Engineering Journal* 25(3): 96–111.

Toth, W.J.

1979 Noise-Abatement Techniques for Construction Equipment. HS-803 293; DOT-TSC-NHTSA-79-45: PB-300 948. U.S. Department of Transportation, National Highway Traffic Safety Administration, Washington, DC.

[UDOT] Utah Department of Transportation

2017 Noise Abatement. UDOT 08A2-1. Effective November 6, 1987. Revised June 15, 2017. https://www.udot.utah.gov/main/uconowner.gf?n=10496602977480171.

Appendix A. Noise Wall Analysis

Syracuse - Barrier 1

17

Wall Length: ft 1577 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 2

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1445	1		Yes	1	64	64	0	No	No	No	No
N603	1			0	65	65	0	No	No	No	No
N604	1			0	64	64	0	No	No	No	No
N605	1			0	65	65	0	No	No	No	No
N627	1		Yes	1	68	68	0	No	No	No	No
N628	1			0	66	66	0	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction:	0
% of First-Row 5 dBA Reduction:	0%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	No

Reasonableness Factors:

# of First-Row Design Goal:	0
% of First-Row Design Goal:	0%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No

# of Benefited:	0
Cost of Noise Wall (Length x Height x $20/sq ft):	$536,180
Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$536,180
Allowable Cost ($30,000 per benefited receptor):	$0
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No

Syracuse - Barrier 2

17

Wall Length: ft 1746 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 7

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N596	1			0	60	60	0	No	No	No	No
N597	1			0	62	62	0	No	No	No	No
N598	1			0	62	62	0	No	No	No	No
N599	1			0	63	63	0	No	No	No	No
N606	1			0	62	62	0	No	No	No	No
N607	1			0	65	65	0	No	No	No	No
N608	1			0	66	66	0	No	No	No	No
N609	1			0	62	62	0	No	No	No	No
N610	1			0	61	61	0	No	No	No	No
N611	1			0	60	60	0	No	No	No	No
N616	1			0	64	64	0	No	No	No	No
N617	1			0	64	64	0	No	No	No	No
N618	1			0	63	63	0	No	No	No	No
N619	1			0	63	63	0	No	No	No	No
N620	1			0	62	62	0	No	No	No	No
N621	1			0	63	63	0	No	No	No	No
N622	1			0	64	63	1	No	No	No	No
N623	1		Yes	1	64	63	1	No	No	No	No
N624	1			0	67	66	1	No	No	No	No
N625	1		Yes	1	71	68	3	No	No	No	No
N626	1			0	68	68	0	No	No	No	No
N629	1		Yes	1	63	62	1	No	No	No	No
N630	1		Yes	1	62	62	0	No	No	No	No
N631	1		Yes	1	62	61	1	No	No	No	No
N632	1		Yes	1	61	61	0	No	No	No	No
N633	1		Yes	1	61	61	0	No	No	No	No
N649	1			0	61	61	0	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction:	0
% of First-Row 5 dBA Reduction:	0%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	No

Reasonableness Factors:

# of First-Row Design Goal:	0
% of First-Row Design Goal:	0%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No

# of Benefited:	0
Cost of Noise Wall (Length x Height x $20/sq ft):	$593,640
Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$593,640
Allowable Cost ($30,000 per benefited receptor):	$0
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No

Syracuse - Barrier 3

17

Wall Length: ft 1000 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 2

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1222	1		Yes	1	59	58	1	No	No	No	No
N1223	1		Yes	1	59	58	1	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction:	0
% of First-Row 5 dBA Reduction:	0%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	No

Reasonableness Factors:

# of First-Row Design Goal:	0
% of First-Row Design Goal:	0%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No

# of Benefited:	0
Cost of Noise Wall (Length x Height x $20/sq ft):	$340,000
Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$340,000
Allowable Cost ($30,000 per benefited receptor):	$0
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No

Syracuse - Barrier 4

17

Wall Length: ft 1471 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 8

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1224	1		Yes	1	61	60	1	No	No	No	No
N1225	1			0	60	60	0	No	No	No	No
N1226	1			0	60	59	1	No	No	No	No
N1227	1		Yes	1	61	60	1	No	No	No	No
N1228	1			0	60	60	0	No	No	No	No
N1229	1			0	60	60	0	No	No	No	No
N1230	1		Yes	1	60	59	1	No	No	No	No
N1231	1			0	59	59	0	No	No	No	No
N1232	1			0	59	59	0	No	No	No	No
N1235	1		Yes	1	63	61	2	No	No	No	No
N1236	1			0	62	61	1	No	No	No	No
N1237	1			0	62	61	1	No	No	No	No
N1238	1		Yes	1	63	61	2	No	No	No	No
N1239	1			0	62	61	1	No	No	No	No
N1240	1			0	62	61	1	No	No	No	No
N1241	1		Yes	1	65	61	4	No	No	No	No
N1242	1			0	64	62	2	No	No	No	No
N1243	1			0	64	62	2	No	No	No	No
N1244	1		Yes	1	65	61	4	No	No	No	No
N1245	1			0	65	62	3	No	No	No	No
N1246	1			0	64	62	2	No	No	No	No
N1247	1		Yes	1	68	63	5	No	Yes	No	Yes
N1248	1			0	67	64	3	No	No	No	No
N1249	1			0	66	64	2	No	No	No	No
N1250	1			0	66	65	1	No	No	No	No
N1251	1			0	67	67	0	No	No	No	No
N1252	1			0	69	69	0	No	No	No	No
N1253	1			0	69	69	0	No	No	No	No
N1254	1			0	65	65	0	No	No	No	No
N1255	1			0	64	64	0	No	No	No	No
N1256	1			0	64	64	0	No	No	No	No
N1257	1			0	65	65	0	No	No	No	No
N1258	1			0	68	68	0	No	No	No	No
N1259	1			0	68	68	0	No	No	No	No
N1260	1			0	65	65	0	No	No	No	No
N1261	1			0	63	63	0	No	No	No	No
N1262	1			0	62	62	0	No	No	No	No
N1263	1			0	64	64	0	No	No	No	No
N1264	1			0	68	68	0	No	No	No	No
N1265	1			0	68	68	0	No	No	No	No
N1266	1			0	64	64	0	No	No	No	No
N1267	1			0	62	62	0	No	No	No	No
N1268	1			0	62	62	0	No	No	No	No
N1269	1			0	64	64	0	No	No	No	No
N1270	1			0	68	68	0	No	No	No	No
N1274	1			0	59	58	1	No	No	No	No

Syracuse - Barrier 4

17

Wall Length: ft 1471 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 8

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1275	1			0	59	59	0	No	No	No	No
N1276	1			0	60	60	0	No	No	No	No
N1277	1			0	60	60	0	No	No	No	No
N1278	1			0	59	59	0	No	No	No	No
N1279	1			0	59	59	0	No	No	No	No
N1280	1			0	59	59	0	No	No	No	No
N1281	1			0	59	59	0	No	No	No	No
N1282	1			0	59	59	0	No	No	No	No
N1283	1			0	59	59	0	No	No	No	No
N1284	1			0	62	61	1	No	No	No	No
N1285	1			0	61	61	0	No	No	No	No
N1286	1			0	61	61	0	No	No	No	No
N1287	1			0	60	60	0	No	No	No	No
N1288	1			0	60	60	0	No	No	No	No
N1289	1			0	60	59	1	No	No	No	No
N1292	1			0	62	62	0	No	No	No	No
N1293	1			0	61	61	0	No	No	No	No
N1294	1			0	61	61	0	No	No	No	No
N1295	1			0	60	60	0	No	No	No	No
N1296	1			0	60	60	0	No	No	No	No
N1297	1			0	60	60	0	No	No	No	No
N1301	1			0	60	60	0	No	No	No	No
N1302	1			0	63	63	0	No	No	No	No
N1304	1			0	63	62	1	No	No	No	No
N1305	1			0	62	62	0	No	No	No	No
N1306	1			0	62	62	0	No	No	No	No
N1307	1			0	61	61	0	No	No	No	No
N1309	1			0	61	61	0	No	No	No	No
N1310	1			0	61	61	0	No	No	No	No
N1311	1			0	61	61	0	No	No	No	No
N1312	1			0	62	62	0	No	No	No	No
N1313	1			0	62	62	0	No	No	No	No

Syracuse - Barrier 4

17

Wall Length: ft 1471 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 8

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1314	1			0	63	62	1	No	No	No	No
N1315	1			0	63	63	0	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction:	1
% of First-Row 5 dBA Reduction:	13%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	No

Reasonableness Factors:

# of First-Row Design Goal:	0
% of First-Row Design Goal:	0%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No

# of Benefited:	1
Cost of Noise Wall (Length x Height x $20/sq ft):	$500,140
Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$500,140
Allowable Cost ($30,000 per benefited receptor):	$30,000
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		12	13	14	15
Wall Length:	ft	3896 ft	3896 ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20				
Cost of items critical to safety:					
# of First Row Receivers:	60				

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	12-ft Noise Level	12-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	13-ft Noise Level	13-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	14-ft Noise Level	14-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	15-ft Noise Level	15-ft Noise Reduction	Design Goal
N1007	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No
N1008	1			0	63	60	3	No	No	No	No	60	3	No	No	No	No	60	3	No	No	No	No	59	4	No
N1009	1			0	64	61	3	No	No	No	No	61	3	No	No	No	No	60	4	No	No	No	No	60	4	No
N1010	1			0	65	62	3	No	No	No	No	62	3	No	No	No	No	61	4	No	No	No	No	61	4	No
N1017	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No
N1018	1			0	62	60	2	No	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No	59	3	No
N1019	1			0	63	61	2	No	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No
N1020	1			0	64	62	2	No	No	No	No	62	2	No	No	No	No	61	3	No	No	No	No	61	3	No
N1021	1			0	64	62	2	No	No	No	No	62	2	No	No	No	No	62	2	No	No	No	No	61	3	No
N1022	1			0	63	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No	No	No	No	59	4	No
N1023	1			0	62	60	2	No	No	No	No	59	3	No	No	No	No	59	3	No	No	No	No	59	3	No
N1044	1			0	60	59	1	No	No	No	No	58	2	No	No	No	No	58	2	No	No	No	No	58	2	No
N1046	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No
N1047	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No
N1048	1			0	62	60	2	No	No	No	No	60	2	No	No	No	No	60	2	No	No	No	No	59	3	No
N1049	1			0	63	61	2	No	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No
N1050	1			0	63	61	2	No	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No
N1051	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No	61	2	No
N1052	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No	61	2	No
N1053	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	58	2	No
N1054	1			0	59	59	0	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No
N1055	1			0	59	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	57	2	No
N1056	1			0	59	59	0	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No
N1057	1			0	59	59	0	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	57	2	No
N1058	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No
N1059	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No
N1060	1			0	59	59	0	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	57	2	No
N1061	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	59	2	No	No	No	No	59	2	No
N1085	1		Yes	1	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No
N1089	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No
N1090	1		Yes	1	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No
N1091	1		Yes	1	63	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No
N1092	1			0	63	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No
N1093	1			0	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No
N1094	1		Yes	1	64	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No
N1095	1			0	63	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No
N1096	1			0	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No
N1097	1		Yes	1	65	65	0	No	No	No	No	65	0	No	No	No	No	65	0	No	No	No	No	65	0	No
N1098	1			0	64	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No
N1099	1			0	63	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No
N1123	1		Yes	1	71	65	6	No	Yes	No	Yes	64	7	Yes	Yes	Yes	Yes	64	7	Yes	Yes	Yes	Yes	63	8	Yes
N1124	1			0	68	65	3	No	No	No	No	64	4	No	No	No	No	63	5	No	Yes	No	No	62	6	No
N1125	1			0	66	64	2	No	No	No	No	64	2	No	No	No	No	63	3	No	No	No	No	61	5	No
N1126	1			0	65	64	1	No	No	No	No	63	2	No	No	No	No	63	2	No	No	No	No	62	3	No
N1127	1		Yes	1	71	65	6	No	Yes	No	Yes	64	7	Yes	Yes	Yes	Yes	64	7	Yes	Yes	Yes	Yes	63	8	Yes
N1128	1			0	68	65	3	No	No	No	No	64	4	No	No	No	No	63	5	No	Yes	No	No	62	6	No
N1129	1			0	67	64	3	No	No	No	No	64	3	No	No	No	No	63	4	No	No	No	No	62	5	No
N1130	1			0	67	64	3	No	No	No	No	64	3	No	No	No	No	63	4	No	No	No	No	62	5	No
N1131	1			0	68	65	3	No	No	No	No	64	4	No	No	No	No	63	5	No	Yes	No	No	62	6	No
N1132	1		Yes	1	71	65	6	No	Yes	No	Yes	64	7	Yes	Yes	Yes	Yes	64	7	Yes	Yes	Yes	Yes	63	8	Yes
N1133	1		Yes	1	72	65	7	Yes	Yes	Yes	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		12	13	14	15
Wall Length:	ft	3896 ft	3896 ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20				
Cost of items critical to safety:					
# of First Row Receivers:	60				

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	12-ft Noise Level	12-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	13-ft Noise Level	13-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	14-ft Noise Level	14-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	15-ft Noise Level	15-ft Noise Reduction	Design Goal
N1134	1			0	68	65	3	No	No	No	No	64	4	No	No	No	No	63	5	No	Yes	No	No	63	5	No
N1135	1			0	67	65	2	No	No	No	No	64	3	No	No	No	No	63	4	No	No	No	No	62	5	No
N1136	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N1137	1			0	69	65	4	No	No	No	No	65	4	No	No	No	No	63	6	No	Yes	No	No	63	6	No
N1138	1			0	67	64	3	No	No	No	No	64	3	No	No	No	No	63	4	No	No	No	No	62	5	No
N1139	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes
N1140	1			0	69	66	3	No	No	No	No	65	4	No	No	No	No	64	5	No	Yes	No	No	63	6	No
N1141	1			0	68	65	3	No	No	No	No	64	4	No	No	No	No	64	4	No	No	No	No	63	5	No
N1142	1		Yes	1	72	67	5	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes
N1143	1			0	69	65	4	No	No	No	No	65	4	No	No	No	No	64	5	No	Yes	No	No	63	6	No
N1144	1			0	68	65	3	No	No	No	No	65	3	No	No	No	No	64	4	No	No	No	No	64	4	No
N1145	1		Yes	1	73	67	6	No	Yes	No	Yes	66	7	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes
N1146	1		Yes	1	71	66	5	No	Yes	No	Yes	65	6	No	Yes	No	Yes	65	6	No	Yes	No	Yes	64	7	Yes
N1147	1			0	70	66	4	No	No	No	No	66	4	No	No	No	No	65	5	No	Yes	No	No	64	6	No
N1148	1			0	68	65	3	No	No	No	No	65	3	No	No	No	No	64	4	No	No	No	No	63	5	No
N1149	1			0	67	65	2	No	No	No	No	64	3	No	No	No	No	64	3	No	No	No	No	63	4	No
N1150	1			0	67	65	2	No	No	No	No	64	3	No	No	No	No	64	3	No	No	No	No	63	4	No
N1151	1		Yes	1	73	68	5	No	Yes	No	Yes	67	6	No	Yes	No	Yes	66	7	Yes	Yes	Yes	Yes	66	7	Yes
N1152	1		Yes	1	71	68	3	No	No	No	No	67	4	No	No	No	No	66	5	No	Yes	No	Yes	66	5	No
N1153	1			0	69	66	3	No	No	No	No	66	3	No	No	No	No	66	3	No	No	No	No	65	4	No
N1154	1			0	69	66	3	No	No	No	No	66	3	No	No	No	No	65	4	No	No	No	No	65	4	No
N1155	1			0	67	65	2	No	No	No	No	65	2	No	No	No	No	64	3	No	No	No	No	64	3	No
N1156	1			0	67	65	2	No	No	No	No	65	2	No	No	No	No	64	3	No	No	No	No	64	3	No
N1157	1			0	64	62	2	No	No	No	No	62	2	No	No	No	No	62	2	No	No	No	No	61	3	No
N1158	1			0	64	63	1	No	No	No	No	62	2	No	No	No	No	62	2	No	No	No	No	62	2	No
N1159	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1160	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1161	1			0	61	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N1162	1			0	61	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N1163	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No	61	2	No
N1164	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No	61	2	No
N1165	1			0	62	62	0	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1166	1			0	61	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N1167	1			0	62	62	0	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1168	1			0	61	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N1169	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No	61	2	No
N1170	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	60	2	No
N1171	1			0	61	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N1172	1			0	64	63	1	No	No	No	No	62	2	No	No	No	No	62	2	No	No	No	No	62	2	No
N1173	1			0	62	62	0	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1174	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No
N1175	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No
N1176	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1177	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No
N1178	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N1180	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No
N1181	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1182	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	60	1	No
N1183	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No
N1184	1			0	62	62	0	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1185	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		12	13	14	15
Wall Length:	ft	3896 ft	3896 ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20				
Cost of items critical to safety:					
# of First Row Receivers:	60				

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	12-ft Noise Level	12-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	13-ft Noise Level	13-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	14-ft Noise Level	14-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	15-ft Noise Level	15-ft Noise Reduction	Design Goal
N1186	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N1187	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No
N1188	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No
N1189	1		Yes	1	68	67	1	No	No	No	No	67	1	No	No	No	No	67	1	No	No	No	No	66	2	No
N1190	1			0	66	66	0	No	No	No	No	66	0	No	No	No	No	66	0	No	No	No	No	65	1	No
N1191	1			0	65	65	0	No	No	No	No	64	1	No	No	No	No	64	1	No	No	No	No	64	1	No
N1192	1			0	65	64	1	No	No	No	No	64	1	No	No	No	No	64	1	No	No	No	No	64	1	No
N1193	1			0	66	65	1	No	No	No	No	65	1	No	No	No	No	65	1	No	No	No	No	65	1	No
N1194	1		Yes	1	67	67	0	No	No	No	No	67	0	No	No	No	No	66	1	No	No	No	No	66	1	No
N1195	1		Yes	1	65	65	0	No	No	No	No	65	0	No	No	No	No	65	0	No	No	No	No	65	0	No
N1196	1			0	64	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No
N1197	1			0	63	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No
N1200	1			0	57	56	1	No	No	No	No	56	1	No	No	No	No	56	1	No	No	No	No	55	2	No
N1201	1			0	58	56	2	No	No	No	No	56	2	No	No	No	No	56	2	No	No	No	No	56	2	No
N1204	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No
N1205	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No
N1206	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	58	2	No
N1207	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	58	2	No
N1208	1			0	60	60	0	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No
N1209	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	59	2	No	No	No	No	59	2	No
N1210	1			0	59	59	0	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No
N1211	1			0	59	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No
N1212	1			0	58	57	1	No	No	No	No	57	1	No	No	No	No	57	1	No	No	No	No	57	1	No
N1213	1			0	58	58	0	No	No	No	No	57	1	No	No	No	No	57	1	No	No	No	No	57	1	No
N1214	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No	No	No	No	57	1	No
N1215	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No	No	No	No	57	1	No
N1216	1			0	59	59	0	No	No	No	No	59	0	No	No	No	No	58	1	No	No	No	No	58	1	No
N1217	1			0	58	57	1	No	No	No	No	57	1	No	No	No	No	57	1	No	No	No	No	57	1	No
N1218	1			0	57	56	1	No	No	No	No	56	1	No	No	No	No	56	1	No	No	No	No	56	1	No
N1219	1			0	57	56	1	No	No	No	No	56	1	No	No	No	No	56	1	No	No	No	No	56	1	No
N1220	1			0	60	60	0	No	No	No	No	60	0	No	No	No	No	60	0	No	No	No	No	59	1	No
N863	1		Yes	1	72	67	5	No	Yes	No	Yes	66	6	No	Yes	No	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes
N864	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N865	1		Yes	1	73	67	6	No	Yes	No	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes
N866	1		Yes	1	73	66	7	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes
N867	1		Yes	1	72	66	6	No	Yes	No	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N868	1		Yes	1	69	64	5	No	Yes	No	Yes	63	6	No	Yes	No	Yes	63	6	No	Yes	No	Yes	62	7	Yes
N869	1		Yes	1	72	66	6	No	Yes	No	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N870	1		Yes	1	73	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes
N871	1		Yes	1	72	66	6	No	Yes	No	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N872	1		Yes	1	72	66	6	No	Yes	No	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N873	1		Yes	1	73	66	7	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes
N874	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N875	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N876	1		Yes	1	73	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes
N877	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N878	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N879	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes
N880	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N881	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N882	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		12	13	14	15
Wall Length:	ft	3896 ft	3896 ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20				
Cost of items critical to safety:					
# of First Row Receivers:	60				

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	12-ft Noise Level	12-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	13-ft Noise Level	13-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	14-ft Noise Level	14-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	15-ft Noise Level	15-ft Noise Reduction	Design Goal
N883	1		Yes	1	71	66	5	No	Yes	No	Yes	65	6	No	Yes	No	Yes	64	7	Yes	Yes	Yes	Yes	63	8	Yes
N884	1		Yes	1	72	66	6	No	Yes	No	Yes	65	7	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	63	9	Yes
N885	1		Yes	1	71	66	5	No	Yes	No	Yes	65	6	No	Yes	No	Yes	64	7	Yes	Yes	Yes	Yes	63	8	Yes
N886	1		Yes	1	70	66	4	No	No	No	No	65	5	No	Yes	No	Yes	64	6	No	Yes	No	Yes	63	7	Yes
N892	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No	No	No	No	57	1	No
N893	1			0	59	58	1	No	No	No	No	58	1	No	No	No	No	58	1	No	No	No	No	57	2	No
N894	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	59	2	No	No	No	No	59	2	No
N895	1			0	63	61	2	No	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No
N896	1			0	66	63	3	No	No	No	No	63	3	No	No	No	No	62	4	No	No	No	No	62	4	No
N897	1		Yes	1	70	66	4	No	No	No	No	65	5	No	Yes	No	Yes	64	6	No	Yes	No	Yes	63	7	Yes
N902	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No	No	No	No	57	1	No
N903	1			0	58	58	0	No	No	No	No	58	0	No	No	No	No	57	1	No	No	No	No	57	1	No
N904	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	58	2	No	No	No	No	58	2	No
N905	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	59	2	No	No	No	No	59	2	No
N906	1			0	66	64	2	No	No	No	No	63	3	No	No	No	No	62	4	No	No	No	No	61	5	No
N907	1		Yes	1	71	66	5	No	Yes	No	Yes	66	5	No	Yes	No	Yes	64	7	Yes	Yes	Yes	Yes	64	7	Yes
N908	1		Yes	1	74	67	7	Yes	Yes	Yes	Yes	65	9	Yes	Yes	Yes	Yes	64	10	Yes	Yes	Yes	Yes	64	10	Yes
N909	1		Yes	1	73	67	6	No	Yes	No	Yes	66	7	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes
N910	1		Yes	1	73	67	6	No	Yes	No	Yes	67	6	No	Yes	No	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes
N911	1		Yes	1	73	68	5	No	Yes	No	Yes	67	6	No	Yes	No	Yes	66	7	Yes	Yes	Yes	Yes	65	8	Yes
N912	1		Yes	1	73	68	5	No	Yes	No	Yes	67	6	No	Yes	No	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes
N913	1		Yes	1	73	68	5	No	Yes	No	Yes	67	6	No	Yes	No	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes
N914	1		Yes	1	73	68	5	No	Yes	No	Yes	66	7	Yes	Yes	Yes	Yes	66	7	Yes	Yes	Yes	Yes	65	8	Yes
N915	1		Yes	1	72	68	4	No	No	No	No	67	5	No	Yes	No	Yes	67	5	No	Yes	No	Yes	65	7	Yes
N916	1		Yes	1	73	68	5	No	Yes	No	Yes	68	5	No	Yes	No	Yes	67	6	No	Yes	No	Yes	65	8	Yes
N917	1		Yes	1	73	69	4	No	No	No	No	68	5	No	Yes	No	Yes	67	6	No	Yes	No	Yes	66	7	Yes
N918	1		Yes	1	73	69	4	No	No	No	No	68	5	No	Yes	No	Yes	68	5	No	Yes	No	Yes	67	6	No
N919	1		Yes	1	73	69	4	No	No	No	No	68	5	No	Yes	No	Yes	68	5	No	Yes	No	Yes	67	6	No
N920	1		Yes	1	73	69	4	No	No	No	No	69	4	No	No	No	No	68	5	No	Yes	No	Yes	66	7	Yes
N921	1		Yes	1	73	69	4	No	No	No	No	68	5	No	Yes	No	Yes	68	5	No	Yes	No	Yes	66	7	Yes
N922	1		Yes	1	72	68	4	No	No	No	No	68	4	No	No	No	No	67	5	No	Yes	No	Yes	67	5	No
N923	1			0	68	67	1	No	No	No	No	67	1	No	No	No	No	67	1	No	No	No	No	66	2	No
N924	1			0	66	65	1	No	No	No	No	65	1	No	No	No	No	65	1	No	No	No	No	65	1	No
N925	1			0	64	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No	No	No	No	64	0	No
N926	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No
N927	1			0	60	60	0	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No
N931	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N932	1			0	61	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No	61	0	No
N933	1			0	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No
N934	1			0	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No
N935	1			0	63	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	63	0	No
N936	1			0	63	64	-1	No	No	No	No	64	-1	No	No	No	No	63	0	No	No	No	No	63	0	No
N938	1			0	60	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No
N939	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N940	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	59	2	No
N941	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	60	2	No
N942	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N943	1			0	62	62	0	No	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No	61	1	No
N944	1			0	63	63	0	No	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No
N945	1			0	63	64	-1	No	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No	62	1	No
N946	1			0	64	64	0	No	No	No	No	63	1	No	No	No	No	63	1	No	No	No	No	63	1	No

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		12	13	14	15
Wall Length:	ft	3896 ft	3896 ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20				
Cost of items critical to safety:					
# of First Row Receivers:	60				

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	12-ft Noise Level	12-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	13-ft Noise Level	13-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	14-ft Noise Level	14-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	15-ft Noise Level	15-ft Noise Reduction	Design Goal
N949	1			0	60	60	0	No	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No	59	1	No
N950	1			0	61	61	0	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No
N951	1			0	62	62	0	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No
N952	1			0	63	63	0	No	No	No	No	63	0	No	No	No	No	62	1	No	No	No	No	62	1	No
N953	1			0	64	63	1	No	No	No	No	63	1	No	No	No	No	63	1	No	No	No	No	62	2	No
N954	1			0	63	62	1	No	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No	61	2	No
N955	1			0	62	61	1	No	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No	60	2	No
N956	1			0	61	60	1	No	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No	59	2	No
N977	1			0	60	59	1	No	No	No	No	58	2	No	No	No	No	58	2	No	No	No	No	58	2	No
N978	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No
N979	1			0	62	60	2	No	No	No	No	60	2	No	No	No	No	60	2	No	No	No	No	59	3	No
N980	1			0	63	61	2	No	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No
N981	1			0	64	62	2	No	No	No	No	62	2	No	No	No	No	61	3	No	No	No	No	61	3	No
N982	1			0	64	62	2	No	No	No	No	62	2	No	No	No	No	61	3	No	No	No	No	61	3	No
N983	1			0	63	61	2	No	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No
N984	1			0	62	60	2	No	No	No	No	60	2	No	No	No	No	60	2	No	No	No	No	59	3	No
N985	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No
N992	1			0	65	62	3	No	No	No	No	62	3	No	No	No	No	61	4	No	No	No	No	61	4	No
N993	1			0	63	61	2	No	No	No	No	60	3	No	No	No	No	60	3	No	No	No	No	59	4	No
N994	1			0	62	60	2	No	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No	59	3	No
N995	1			0	61	59	2	No	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No	58	3	No

Feasibility Factors:				
# of First-Row 5 dBA Reduction:	42	49	52	52
% of First-Row 5 dBA Reduction:	70%	82%	87%	87%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	Yes	Yes	Yes	Yes
Reasonableness Factors:				
# of First-Row Design Goal:	6	30	39	48
% of First-Row Design Goal:	10%	50%	65%	80%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No	Yes	Yes	Yes
# of Benefited:	42	49	60	68
Cost of Noise Wall (Length x Height x $20/sq ft):	$935,040	$1,012,960	$1,090,880	$1,168,800
Cost of any other items critical to safety:	0	0	0	0
Anticipated Cost of Noise Abatement:	$935,040	$1,012,960	$1,090,880	$1,168,800
Allowable Cost ($30,000 per benefited receptor):	$1,260,000	$1,470,000	$1,800,000	$2,040,000
Cost Effective (Anticipated Cost < Allowable Cost):	Yes	Yes	Yes	Yes
Feasible and Reasonable:	No	Yes	Yes	Yes

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		16	17
Wall Length:	ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20		
Cost of items critical to safety:			
# of First Row Receivers:	60		

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	16-ft Noise Level	16-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1007	1			0	61	No	No	No	58	3	No	No	No	No	56	5	No	Yes	No	No
N1008	1			0	63	No	No	No	58	5	No	Yes	No	No	57	6	No	Yes	No	No
N1009	1			0	64	No	No	No	58	6	No	Yes	No	No	58	6	No	Yes	No	No
N1010	1			0	65	No	No	No	59	6	No	Yes	No	No	59	6	No	Yes	No	No
N1017	1			0	61	No	No	No	57	4	No	No	No	No	56	5	No	Yes	No	No
N1018	1			0	62	No	No	No	58	4	No	No	No	No	57	5	No	Yes	No	No
N1019	1			0	63	No	No	No	59	4	No	No	No	No	58	5	No	Yes	No	No
N1020	1			0	64	No	No	No	59	5	No	Yes	No	No	58	6	No	Yes	No	No
N1021	1			0	64	No	No	No	59	5	No	Yes	No	No	59	5	No	Yes	No	No
N1022	1			0	63	No	No	No	58	5	No	Yes	No	No	57	6	No	Yes	No	No
N1023	1			0	62	No	No	No	58	4	No	No	No	No	57	5	No	Yes	No	No
N1044	1			0	60	No	No	No	57	3	No	No	No	No	56	4	No	No	No	No
N1046	1			0	61	No	No	No	58	3	No	No	No	No	56	5	No	Yes	No	No
N1047	1			0	61	No	No	No	58	3	No	No	No	No	56	5	No	Yes	No	No
N1048	1			0	62	No	No	No	58	4	No	No	No	No	57	5	No	Yes	No	No
N1049	1			0	63	No	No	No	59	4	No	No	No	No	58	5	No	Yes	No	No
N1050	1			0	63	No	No	No	59	4	No	No	No	No	58	5	No	Yes	No	No
N1051	1			0	63	No	No	No	59	4	No	No	No	No	59	4	No	No	No	No
N1052	1			0	63	No	No	No	59	4	No	No	No	No	59	4	No	No	No	No
N1053	1			0	60	No	No	No	57	3	No	No	No	No	57	3	No	No	No	No
N1054	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1055	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1056	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1057	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1058	1			0	58	No	No	No	56	2	No	No	No	No	56	2	No	No	No	No
N1059	1			0	58	No	No	No	56	2	No	No	No	No	56	2	No	No	No	No
N1060	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1061	1			0	61	No	No	No	58	3	No	No	No	No	57	4	No	No	No	No
N1085	1		Yes	1	62	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No
N1089	1			0	61	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No
N1090	1		Yes	1	62	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No
N1091	1		Yes	1	63	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No
N1092	1			0	63	No	No	No	62	1	No	No	No	No	62	1	No	No	No	No
N1093	1			0	62	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No
N1094	1		Yes	1	64	No	No	No	64	0	No	No	No	No	63	1	No	No	No	No
N1095	1			0	63	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No
N1096	1			0	62	No	No	No	62	0	No	No	No	No	62	0	No	No	No	No
N1097	1		Yes	1	65	No	No	No	65	0	No	No	No	No	65	0	No	No	No	No
N1098	1			0	64	No	No	No	64	0	No	No	No	No	64	0	No	No	No	No
N1099	1			0	63	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No
N1123	1		Yes	1	71	Yes	Yes	Yes	62	9	Yes	Yes	Yes	Yes	62	9	Yes	Yes	Yes	Yes
N1124	1			0	68	Yes	No	No	62	6	No	Yes	No	No	61	7	Yes	Yes	No	No
N1125	1			0	66	Yes	No	No	61	5	No	Yes	No	No	60	6	No	Yes	No	No
N1126	1			0	65	No	No	No	61	4	No	No	No	No	60	5	No	Yes	No	No
N1127	1		Yes	1	71	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes	62	9	Yes	Yes	Yes	Yes
N1128	1			0	68	Yes	No	No	62	6	No	Yes	No	No	61	7	Yes	Yes	No	No
N1129	1			0	67	Yes	No	No	61	6	No	Yes	No	No	61	6	No	Yes	No	No
N1130	1			0	67	Yes	No	No	61	6	No	Yes	No	No	61	6	No	Yes	No	No
N1131	1			0	68	Yes	No	No	62	6	No	Yes	No	No	61	7	Yes	Yes	No	No
N1132	1		Yes	1	71	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes	62	9	Yes	Yes	Yes	Yes
N1133	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		16	17
Wall Length:	ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20		
Cost of items critical to safety:			
# of First Row Receivers:	60		

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	16-ft Noise Level	16-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1134	1			0	68	Yes	No	No	62	6	No	Yes	No	No	61	7	Yes	Yes	No	No
N1135	1			0	67	Yes	No	No	62	5	No	Yes	No	No	61	6	No	Yes	No	No
N1136	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N1137	1			0	69	Yes	No	No	62	7	Yes	Yes	No	No	62	7	Yes	Yes	No	No
N1138	1			0	67	Yes	No	No	62	5	No	Yes	No	No	61	6	No	Yes	No	No
N1139	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes
N1140	1			0	69	Yes	No	No	62	7	Yes	Yes	No	No	62	7	Yes	Yes	No	No
N1141	1			0	68	Yes	No	No	62	6	No	Yes	No	No	61	7	Yes	Yes	No	No
N1142	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes
N1143	1			0	69	Yes	No	No	62	7	Yes	Yes	No	No	62	7	Yes	Yes	No	No
N1144	1			0	68	No	No	No	62	6	No	Yes	No	No	62	6	No	Yes	No	No
N1145	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes
N1146	1		Yes	1	71	Yes	Yes	Yes	64	7	Yes	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes
N1147	1			0	70	Yes	No	No	63	7	Yes	Yes	No	No	63	7	Yes	Yes	No	No
N1148	1			0	68	Yes	No	No	63	5	No	Yes	No	No	62	6	No	Yes	No	No
N1149	1			0	67	No	No	No	62	5	No	Yes	No	No	62	5	No	Yes	No	No
N1150	1			0	67	No	No	No	62	5	No	Yes	No	No	62	5	No	Yes	No	No
N1151	1		Yes	1	73	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes
N1152	1		Yes	1	71	Yes	No	Yes	66	5	No	Yes	No	Yes	65	6	No	Yes	No	Yes
N1153	1			0	69	No	No	No	64	5	No	Yes	No	No	64	5	No	Yes	No	No
N1154	1			0	69	No	No	No	64	5	No	Yes	No	No	64	5	No	Yes	No	No
N1155	1			0	67	No	No	No	63	4	No	No	No	No	63	4	No	No	No	No
N1156	1			0	67	No	No	No	63	4	No	No	No	No	63	4	No	No	No	No
N1157	1			0	64	No	No	No	60	4	No	No	No	No	60	4	No	No	No	No
N1158	1			0	64	No	No	No	61	3	No	No	No	No	60	4	No	No	No	No
N1159	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N1160	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N1161	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N1162	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N1163	1			0	63	No	No	No	60	3	No	No	No	No	59	4	No	No	No	No
N1164	1			0	63	No	No	No	60	3	No	No	No	No	59	4	No	No	No	No
N1165	1			0	62	No	No	No	59	3	No	No	No	No	59	3	No	No	No	No
N1166	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N1167	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N1168	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N1169	1			0	63	No	No	No	60	3	No	No	No	No	59	4	No	No	No	No
N1170	1			0	62	No	No	No	59	3	No	No	No	No	59	3	No	No	No	No
N1171	1			0	61	No	No	No	58	3	No	No	No	No	58	3	No	No	No	No
N1172	1			0	64	No	No	No	61	3	No	No	No	No	60	4	No	No	No	No
N1173	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N1174	1			0	61	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No
N1175	1			0	63	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No
N1176	1			0	62	No	No	No	60	2	No	No	No	No	60	2	No	No	No	No
N1177	1			0	61	No	No	No	60	1	No	No	No	No	59	2	No	No	No	No
N1178	1			0	61	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No
N1180	1			0	63	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No
N1181	1			0	62	No	No	No	61	1	No	No	No	No	60	2	No	No	No	No
N1182	1			0	61	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No
N1183	1			0	63	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No
N1184	1			0	62	No	No	No	61	1	No	No	No	No	60	2	No	No	No	No
N1185	1			0	61	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		16	17
Wall Length:	ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20		
Cost of items critical to safety:			
# of First Row Receivers:	60		

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	16-ft Noise Level	16-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1186	1			0	62	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No
N1187	1			0	61	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No
N1188	1			0	61	No	No	No	61	0	No	No	No	No	61	0	No	No	No	No
N1189	1		Yes	1	68	No	No	No	66	2	No	No	No	No	66	2	No	No	No	No
N1190	1			0	66	No	No	No	65	1	No	No	No	No	65	1	No	No	No	No
N1191	1			0	65	No	No	No	64	1	No	No	No	No	63	2	No	No	No	No
N1192	1			0	65	No	No	No	64	1	No	No	No	No	63	2	No	No	No	No
N1193	1			0	66	No	No	No	65	1	No	No	No	No	65	1	No	No	No	No
N1194	1		Yes	1	67	No	No	No	66	1	No	No	No	No	66	1	No	No	No	No
N1195	1		Yes	1	65	No	No	No	65	0	No	No	No	No	65	0	No	No	No	No
N1196	1			0	64	No	No	No	64	0	No	No	No	No	64	0	No	No	No	No
N1197	1			0	63	No	No	No	63	0	No	No	No	No	63	0	No	No	No	No
N1200	1			0	57	No	No	No	55	2	No	No	No	No	54	3	No	No	No	No
N1201	1			0	58	No	No	No	55	3	No	No	No	No	54	4	No	No	No	No
N1204	1			0	60	No	No	No	58	2	No	No	No	No	57	3	No	No	No	No
N1205	1			0	60	No	No	No	58	2	No	No	No	No	57	3	No	No	No	No
N1206	1			0	60	No	No	No	58	2	No	No	No	No	57	3	No	No	No	No
N1207	1			0	60	No	No	No	57	3	No	No	No	No	57	3	No	No	No	No
N1208	1			0	60	No	No	No	58	2	No	No	No	No	57	3	No	No	No	No
N1209	1			0	61	No	No	No	58	3	No	No	No	No	57	4	No	No	No	No
N1210	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1211	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1212	1			0	58	No	No	No	56	2	No	No	No	No	55	3	No	No	No	No
N1213	1			0	58	No	No	No	56	2	No	No	No	No	55	3	No	No	No	No
N1214	1			0	58	No	No	No	56	2	No	No	No	No	55	3	No	No	No	No
N1215	1			0	58	No	No	No	56	2	No	No	No	No	56	2	No	No	No	No
N1216	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N1217	1			0	58	No	No	No	56	2	No	No	No	No	55	3	No	No	No	No
N1218	1			0	57	No	No	No	55	2	No	No	No	No	54	3	No	No	No	No
N1219	1			0	57	No	No	No	55	2	No	No	No	No	54	3	No	No	No	No
N1220	1			0	60	No	No	No	59	1	No	No	No	No	58	2	No	No	No	No
N863	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N864	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N865	1		Yes	1	73	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes	62	11	Yes	Yes	Yes	Yes
N866	1		Yes	1	73	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes
N867	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N868	1		Yes	1	69	Yes	Yes	Yes	62	7	Yes	Yes	Yes	Yes	61	8	Yes	Yes	Yes	Yes
N869	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N870	1		Yes	1	73	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes	62	11	Yes	Yes	Yes	Yes
N871	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N872	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N873	1		Yes	1	73	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes	62	11	Yes	Yes	Yes	Yes
N874	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N875	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N876	1		Yes	1	73	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes	62	11	Yes	Yes	Yes	Yes
N877	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N878	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N879	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N880	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N881	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N882	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		16	17
Wall Length:	ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20		
Cost of items critical to safety:			
# of First Row Receivers:	60		

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	16-ft Noise Level	16-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N883	1		Yes	1	71	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes	62	9	Yes	Yes	Yes	Yes
N884	1		Yes	1	72	Yes	Yes	Yes	63	9	Yes	Yes	Yes	Yes	62	10	Yes	Yes	Yes	Yes
N885	1		Yes	1	71	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes	62	9	Yes	Yes	Yes	Yes
N886	1		Yes	1	70	Yes	Yes	Yes	62	8	Yes	Yes	Yes	Yes	62	8	Yes	Yes	Yes	Yes
N892	1			0	58	No	No	No	57	1	No	No	No	No	55	3	No	No	No	No
N893	1			0	59	No	No	No	57	2	No	No	No	No	56	3	No	No	No	No
N894	1			0	61	No	No	No	58	3	No	No	No	No	57	4	No	No	No	No
N895	1			0	63	No	No	No	58	5	No	Yes	No	No	58	5	No	Yes	No	No
N896	1			0	66	No	No	No	60	6	No	Yes	No	No	59	7	Yes	Yes	No	No
N897	1		Yes	1	70	Yes	Yes	Yes	62	8	Yes	Yes	Yes	Yes	62	8	Yes	Yes	Yes	Yes
N902	1			0	58	No	No	No	57	1	No	No	No	No	56	2	No	No	No	No
N903	1			0	58	No	No	No	56	2	No	No	No	No	55	3	No	No	No	No
N904	1			0	60	No	No	No	57	3	No	No	No	No	56	4	No	No	No	No
N905	1			0	61	No	No	No	57	4	No	No	No	No	57	4	No	No	No	No
N906	1			0	66	Yes	No	No	60	6	No	Yes	No	No	59	7	Yes	Yes	No	No
N907	1		Yes	1	71	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes	63	8	Yes	Yes	Yes	Yes
N908	1		Yes	1	74	Yes	Yes	Yes	63	11	Yes	Yes	Yes	Yes	63	11	Yes	Yes	Yes	Yes
N909	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes
N910	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes
N911	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes
N912	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes
N913	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	63	10	Yes	Yes	Yes	Yes
N914	1		Yes	1	73	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes
N915	1		Yes	1	72	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes	64	8	Yes	Yes	Yes	Yes
N916	1		Yes	1	73	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes
N917	1		Yes	1	73	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes
N918	1		Yes	1	73	Yes	No	Yes	65	8	Yes	Yes	Yes	Yes	64	9	Yes	Yes	Yes	Yes
N919	1		Yes	1	73	Yes	No	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes
N920	1		Yes	1	73	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes
N921	1		Yes	1	73	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes	65	8	Yes	Yes	Yes	Yes
N922	1		Yes	1	72	Yes	No	Yes	66	6	No	Yes	No	Yes	66	6	No	Yes	No	Yes
N923	1			0	68	No	No	No	66	2	No	No	No	No	66	2	No	No	No	No
N924	1			0	66	No	No	No	64	2	No	No	No	No	64	2	No	No	No	No
N925	1			0	64	No	No	No	63	1	No	No	No	No	63	1	No	No	No	No
N926	1			0	61	No	No	No	61	0	No	No	No	No	60	1	No	No	No	No
N927	1			0	60	No	No	No	59	1	No	No	No	No	59	1	No	No	No	No
N931	1			0	62	No	No	No	61	1	No	No	No	No	60	2	No	No	No	No
N932	1			0	61	No	No	No	60	1	No	No	No	No	60	1	No	No	No	No
N933	1			0	62	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No
N934	1			0	62	No	No	No	61	1	No	No	No	No	61	1	No	No	No	No
N935	1			0	63	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No
N936	1			0	63	No	No	No	63	0	No	No	No	No	61	2	No	No	No	No
N938	1			0	60	No	No	No	58	2	No	No	No	No	58	2	No	No	No	No
N939	1			0	61	No	No	No	59	2	No	No	No	No	59	2	No	No	No	No
N940	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N941	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N942	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N943	1			0	62	No	No	No	61	1	No	No	No	No	60	2	No	No	No	No
N944	1			0	63	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No
N945	1			0	63	No	No	No	62	1	No	No	No	No	61	2	No	No	No	No
N946	1			0	64	No	No	No	62	2	No	No	No	No	61	3	No	No	No	No

Syracuse - Barrier 5Short MOD1

Syracuse - Barrier 5

		16	17
Wall Length:	ft	3896 ft	3896 ft
Wall Cost per sq ft:	$20		
Cost of items critical to safety:			
# of First Row Receivers:	60		

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	16-ft Noise Level	16-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N949	1			0	60	No	No	No	58	2	No	No	No	No	57	3	No	No	No	No
N950	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N951	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N952	1			0	63	No	No	No	61	2	No	No	No	No	60	3	No	No	No	No
N953	1			0	64	No	No	No	61	3	No	No	No	No	60	4	No	No	No	No
N954	1			0	63	No	No	No	61	2	No	No	No	No	59	4	No	No	No	No
N955	1			0	62	No	No	No	60	2	No	No	No	No	59	3	No	No	No	No
N956	1			0	61	No	No	No	59	2	No	No	No	No	58	3	No	No	No	No
N977	1			0	60	No	No	No	57	3	No	No	No	No	56	4	No	No	No	No
N978	1			0	61	No	No	No	58	3	No	No	No	No	56	5	No	Yes	No	No
N979	1			0	62	No	No	No	59	3	No	No	No	No	57	5	No	Yes	No	No
N980	1			0	63	No	No	No	59	4	No	No	No	No	58	5	No	Yes	No	No
N981	1			0	64	No	No	No	59	5	No	Yes	No	No	59	5	No	Yes	No	No
N982	1			0	64	No	No	No	59	5	No	Yes	No	No	58	6	No	Yes	No	No
N983	1			0	63	No	No	No	59	4	No	No	No	No	58	5	No	Yes	No	No
N984	1			0	62	No	No	No	59	3	No	No	No	No	57	5	No	Yes	No	No
N985	1			0	61	No	No	No	58	3	No	No	No	No	56	5	No	Yes	No	No
N992	1			0	65	No	No	No	59	6	No	Yes	No	No	58	7	Yes	Yes	No	No
N993	1			0	63	No	No	No	58	5	No	Yes	No	No	57	6	No	Yes	No	No
N994	1			0	62	No	No	No	58	4	No	No	No	No	57	5	No	Yes	No	No
N995	1			0	61	No	No	No	57	4	No	No	No	No	56	5	No	Yes	No	No

Feasibility Factors:			
# of First-Row 5 dBA Reduction:	52	52	
% of First-Row 5 dBA Reduction:	87%	87%	
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	Yes	Yes	
Reasonableness Factors:			
# of First-Row Design Goal:	50	50	
% of First-Row Design Goal:	83%	83%	
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	Yes	Yes	
# of Benefited:	85	104	
Cost of Noise Wall (Length x Height x $20/sq ft):	$1,246,720	$1,324,640	
Cost of any other items critical to safety:	0	0	
Anticipated Cost of Noise Abatement:	$1,246,720	$1,324,640	
Allowable Cost ($30,000 per benefited receptor):	$2,550,000	$3,120,000	
Cost Effective (Anticipated Cost < Allowable Cost):	Yes	Yes	
Feasible and Reasonable:	Yes	Yes	

Syracuse - Barrier 6

17

Wall Length: ft 1838 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 9

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1445	1		Yes	1	64	62	2	No	No	No	No
N596	1			0	59	57	2	No	No	No	No
N597	1			0	61	59	2	No	No	No	No
N598	1			0	62	61	1	No	No	No	No
N599	1			0	63	62	1	No	No	No	No
N603	1			0	65	64	1	No	No	No	No
N604	1			0	64	62	2	No	No	No	No
N605	1			0	65	63	2	No	No	No	No
N606	1			0	62	59	3	No	No	No	No
N607	1			0	65	64	1	No	No	No	No
N608	1			0	66	65	1	No	No	No	No
N609	1			0	62	59	3	No	No	No	No
N610	1			0	61	58	3	No	No	No	No
N611	1			0	60	57	3	No	No	No	No
N616	1			0	65	61	4	No	No	No	No
N617	1			0	64	60	4	No	No	No	No
N618	1			0	64	60	4	No	No	No	No
N619	1			0	63	59	4	No	No	No	No
N620	1			0	62	58	4	No	No	No	No
N621	1			0	63	59	4	No	No	No	No
N622	1			0	64	60	4	No	No	No	No
N623	1		Yes	1	65	61	4	No	No	No	No
N624	1			0	68	65	3	No	No	No	No
N625	1		Yes	1	71	69	2	No	No	No	No
N626	1			0	68	66	2	No	No	No	No
N627	1		Yes	1	68	64	4	No	No	No	No
N628	1			0	66	64	2	No	No	No	No
N629	1		Yes	1	63	59	4	No	No	No	No
N630	1		Yes	1	62	59	3	No	No	No	No
N631	1		Yes	1	62	58	4	No	No	No	No
N632	1		Yes	1	61	58	3	No	No	No	No
N633	1		Yes	1	61	58	3	No	No	No	No
N649	1			0	61	57	4	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction:	0
% of First-Row 5 dBA Reduction:	0%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	No

Reasonableness Factors:

# of First-Row Design Goal:	0
% of First-Row Design Goal:	0%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No
# of Benefited:	0
Cost of Noise Wall (Length x Height x $20/sq ft):	$624,920
Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$624,920
Allowable Cost ($30,000 per benefited receptor):	$0
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No

Syracuse - Barrier 1 & 2 Combo

17

Wall Length: ft 4055 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 9

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1445	1		Yes	1	64	64	0	No	No	No	No
N596	1			0	60	60	0	No	No	No	No
N597	1			0	62	62	0	No	No	No	No
N598	1			0	62	62	0	No	No	No	No
N599	1			0	63	63	0	No	No	No	No
N603	1			0	65	65	0	No	No	No	No
N604	1			0	64	64	0	No	No	No	No
N605	1			0	65	65	0	No	No	No	No
N606	1			0	62	62	0	No	No	No	No
N607	1			0	65	65	0	No	No	No	No
N608	1			0	66	66	0	No	No	No	No
N609	1			0	62	62	0	No	No	No	No
N610	1			0	61	61	0	No	No	No	No
N611	1			0	60	61	-1	No	No	No	No
N616	1			0	64	64	0	No	No	No	No
N617	1			0	64	64	0	No	No	No	No
N618	1			0	63	63	0	No	No	No	No
N619	1			0	63	63	0	No	No	No	No
N620	1			0	62	62	0	No	No	No	No
N621	1			0	63	63	0	No	No	No	No
N622	1			0	64	63	1	No	No	No	No
N623	1		Yes	1	64	63	1	No	No	No	No
N624	1			0	67	66	1	No	No	No	No
N625	1		Yes	1	71	68	3	No	No	No	No
N626	1			0	68	68	0	No	No	No	No
N627	1		Yes	1	68	68	0	No	No	No	No
N628	1			0	66	66	0	No	No	No	No
N629	1		Yes	1	63	62	1	No	No	No	No
N630	1		Yes	1	62	62	0	No	No	No	No
N631	1		Yes	1	62	61	1	No	No	No	No
N632	1		Yes	1	61	61	0	No	No	No	No
N633	1		Yes	1	61	61	0	No	No	No	No
N649	1			0	61	61	0	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction: 0

% of First-Row 5 dBA Reduction: 0%

Acoustic Feasibility (5 dBA reduction for 50% of front-row): No

Reasonableness Factors:

# of First-Row Design Goal: 0

% of First-Row Design Goal: 0%

Noise Abatement Design Goal (7 dBA reduction for 35% of front-row): No

# of Benefited: 0

Cost of Noise Wall (Length x Height x $20/sq ft): $1,378,700

Cost of any other items critical to safety: 0

Anticipated Cost of Noise Abatement: $1,378,700

Allowable Cost ($30,000 per benefited receptor): $0

Syracuse - Barrier 1 & 2 Combo

17

Wall Length: ft 4055 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 9

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
Cost Effective (Anticipated Cost < Allowable Cost):								No			
Feasible and Reasonable:								No			

Syracuse - Barrier 1, 2, and 6 Combo

17

Wall Length: ft 5893 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 9

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1445	1		Yes	1	64	61	3	No	No	No	No
N596	1			0	59	57	2	No	No	No	No
N597	1			0	61	59	2	No	No	No	No
N598	1			0	62	61	1	No	No	No	No
N599	1			0	63	62	1	No	No	No	No
N603	1			0	65	64	1	No	No	No	No
N604	1			0	64	62	2	No	No	No	No
N605	1			0	65	63	2	No	No	No	No
N606	1			0	62	59	3	No	No	No	No
N607	1			0	65	63	2	No	No	No	No
N608	1			0	66	65	1	No	No	No	No
N609	1			0	62	59	3	No	No	No	No
N610	1			0	61	58	3	No	No	No	No
N611	1			0	60	57	3	No	No	No	No
N616	1			0	65	60	5	No	Yes	No	No
N617	1			0	64	59	5	No	Yes	No	No
N618	1			0	64	59	5	No	Yes	No	No
N619	1			0	63	58	5	No	Yes	No	No
N620	1			0	62	58	4	No	No	No	No
N621	1			0	63	58	5	No	Yes	No	No
N622	1			0	64	59	5	No	Yes	No	No
N623	1		Yes	1	65	58	7	Yes	Yes	Yes	Yes
N624	1			0	68	64	4	No	No	No	No
N625	1		Yes	1	71	67	4	No	No	No	No
N626	1			0	68	66	2	No	No	No	No
N627	1		Yes	1	68	63	5	No	Yes	No	Yes
N628	1			0	66	63	3	No	No	No	No
N629	1		Yes	1	63	58	5	No	Yes	No	Yes
N630	1		Yes	1	62	58	4	No	No	No	No
N631	1		Yes	1	62	57	5	No	Yes	No	Yes
N632	1		Yes	1	61	57	4	No	No	No	No
N633	1		Yes	1	61	57	4	No	No	No	No
N649	1			0	61	56	5	No	Yes	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction:	4
% of First-Row 5 dBA Reduction:	44%
Acoustic Feasibility (5 dBA reduction for 50% of front-row):	No

Reasonableness Factors:

# of First-Row Design Goal:	1
% of First-Row Design Goal:	11%
Noise Abatement Design Goal (7 dBA reduction for 35% of front-row):	No
# of Benefited:	11
Cost of Noise Wall (Length x Height x $20/sq ft):	$2,003,620
Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$2,003,620
Allowable Cost ($30,000 per benefited receptor):	$330,000
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No

Syracuse - Barrier 4 and 4A Combo

17

Wall Length: ft 2743 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 8

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1069	1			0	62	62	0	No	No	No	No
N1224	1		Yes	1	61	60	1	No	No	No	No
N1225	1			0	60	60	0	No	No	No	No
N1226	1			0	60	59	1	No	No	No	No
N1227	1		Yes	1	61	60	1	No	No	No	No
N1228	1			0	60	60	0	No	No	No	No
N1229	1			0	60	60	0	No	No	No	No
N1230	1		Yes	1	60	59	1	No	No	No	No
N1231	1			0	59	59	0	No	No	No	No
N1232	1			0	59	59	0	No	No	No	No
N1235	1		Yes	1	63	61	2	No	No	No	No
N1236	1			0	62	61	1	No	No	No	No
N1237	1			0	62	61	1	No	No	No	No
N1238	1		Yes	1	63	61	2	No	No	No	No
N1239	1			0	62	61	1	No	No	No	No
N1240	1			0	62	61	1	No	No	No	No
N1241	1		Yes	1	65	61	4	No	No	No	No
N1242	1			0	64	62	2	No	No	No	No
N1243	1			0	64	62	2	No	No	No	No
N1244	1		Yes	1	65	61	4	No	No	No	No
N1245	1			0	65	62	3	No	No	No	No
N1246	1			0	64	62	2	No	No	No	No
N1247	1		Yes	1	68	63	5	No	Yes	No	Yes
N1248	1			0	67	64	3	No	No	No	No
N1249	1			0	66	64	2	No	No	No	No
N1250	1			0	66	65	1	No	No	No	No
N1251	1			0	67	66	1	No	No	No	No
N1252	1			0	69	69	0	No	No	No	No
N1253	1			0	69	69	0	No	No	No	No
N1254	1			0	65	65	0	No	No	No	No
N1255	1			0	64	64	0	No	No	No	No
N1256	1			0	64	64	0	No	No	No	No
N1257	1			0	65	65	0	No	No	No	No
N1258	1			0	68	68	0	No	No	No	No
N1259	1			0	68	68	0	No	No	No	No
N1260	1			0	65	65	0	No	No	No	No
N1261	1			0	63	63	0	No	No	No	No
N1262	1			0	62	62	0	No	No	No	No
N1263	1			0	64	64	0	No	No	No	No
N1264	1			0	68	68	0	No	No	No	No
N1265	1			0	68	68	0	No	No	No	No
N1266	1			0	64	64	0	No	No	No	No
N1267	1			0	62	62	0	No	No	No	No
N1268	1			0	62	62	0	No	No	No	No
N1269	1			0	64	64	0	No	No	No	No
N1270	1			0	68	68	0	No	No	No	No

Syracuse - Barrier 4 and 4A Combo

17

Wall Length: ft 2743 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 8

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction
N1274	1			0	59	59	0	No	No	No	No
N1275	1			0	59	59	0	No	No	No	No
N1276	1			0	60	60	0	No	No	No	No
N1277	1			0	60	60	0	No	No	No	No
N1278	1			0	59	59	0	No	No	No	No
N1279	1			0	59	59	0	No	No	No	No
N1280	1			0	59	59	0	No	No	No	No
N1281	1			0	59	59	0	No	No	No	No
N1282	1			0	59	59	0	No	No	No	No
N1283	1			0	59	59	0	No	No	No	No
N1284	1			0	62	62	0	No	No	No	No
N1285	1			0	61	61	0	No	No	No	No
N1286	1			0	61	61	0	No	No	No	No
N1287	1			0	60	60	0	No	No	No	No
N1288	1			0	60	60	0	No	No	No	No
N1289	1			0	60	60	0	No	No	No	No
N1292	1			0	62	62	0	No	No	No	No
N1293	1			0	61	61	0	No	No	No	No
N1294	1			0	61	61	0	No	No	No	No
N1295	1			0	60	60	0	No	No	No	No
N1296	1			0	60	60	0	No	No	No	No
N1297	1			0	60	60	0	No	No	No	No
N1301	1			0	60	60	0	No	No	No	No
N1302	1			0	63	63	0	No	No	No	No
N1304	1			0	63	62	1	No	No	No	No
N1305	1			0	62	62	0	No	No	No	No
N1306	1			0	62	62	0	No	No	No	No
N1307	1			0	61	61	0	No	No	No	No
N1309	1			0	61	61	0	No	No	No	No
N1310	1			0	61	61	0	No	No	No	No
N1311	1			0	61	61	0	No	No	No	No
N1312	1			0	62	62	0	No	No	No	No
N1313	1			0	62	62	0	No	No	No	No
N1314	1			0	63	62	1	No	No	No	No
N1315	1			0	63	63	0	No	No	No	No
N667	1			0	62	62	0	No	No	No	No

Feasibility Factors:

# of First-Row 5 dBA Reduction: 1

% of First-Row 5 dBA Reduction: 13%

Acoustic Feasibility (5 dBA reduction for 50% of front-row): No

Reasonableness Factors:

# of First-Row Design Goal: 0

% of First-Row Design Goal: 0%

Noise Abatement Design Goal (7 dBA reduction for 35% of front-row): No

# of Benefited: 1

Cost of Noise Wall (Length x Height x $20/sq ft): $932,620

Syracuse - Barrier 4 and 4A Combo

17

Wall Length: ft 2743 ft

Wall Cost per sq ft: $20

Cost of items critical to safety:

# of First Row Receivers: 8

Name	# of DU	Relocation	1st Row	# of 1st Row	Baseline Noise Level	17-ft Noise Level	17-ft Noise Reduction	Design Goal	Benefited	1st Row Design Goal	1st Row 5 dBA Reduction

Cost of any other items critical to safety:	0
Anticipated Cost of Noise Abatement:	$932,620
Allowable Cost ($30,000 per benefited receptor):	$30,000
Cost Effective (Anticipated Cost < Allowable Cost):	No
Feasible and Reasonable:	No