



NOISE REPORT

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NOISE REPORT

1.0 INTRODUCTION

This noise analysis was prepared in accordance with the UDOT Noise Abatement Policy, last revised June 15, 2017, consistent with federal regulation 23 CFR 772 and Utah Administrative Code R930-3.

The environmental review, consultation, and other actions required by applicable Federal environmental laws for this project are being, or have been, carried-out by UDOT pursuant to 23 U.S.C. 327 and a Memorandum of Understanding dated January 17, 2017, and executed by FHWA and UDOT.

2.0 DESCRIPTION OF PROJECT

UDOT, in conjunction with Washington City, is preparing an Environmental Impact Statement (EIS) to evaluate the current and future transportation and safety needs at Interstate 15 (I-15)/Green Spring Drive Interchange (Exit 10) and the surrounding roadway system in Washington City, Utah. The study area is along I-15 between approximately Milepost 10 to 13, on Green Spring Drive between Shadow Ridge Drive and Telegraph Street, Main Street between Buena Vista Boulevard and 300 North, and 300 East between Buena Vista Boulevard and 300 North (see Figure 1). The study includes two build alternatives including:

Alternative 4: Main Street Interchange

This alternative would:

- Install a new interchange on I-15 at Main Street in Washington City
- Widen Main Street to five lanes between Buena Vista Boulevard and Telegraph Street
- Add a dedicated right-turn lane for

westbound Telegraph Street at Main Street

- Widen Green Spring Drive/3050 East to seven lanes
- Add a dedicated right-turn lane for southbound Green Spring Drive at Buena Vista Boulevard
- Widen Telegraph Street/Green Spring Drive intersection
- Widen Telegraph Street to seven lanes
- Widen/improve Telegraph Street/750 West intersection
- Install raised median along portions of Telegraph Street and Green Spring Drive/3050 East

Alternative 5: 300 East Interchange

This alternative would:

- Install a new interchange on I-15 at 300 East in Washington City.
- Widen 300 East to five lanes between Buena Vista Boulevard and Telegraph Street
- Widen/Improve 300 East/Telegraph Street intersection
- Widen Green Spring Drive/ 3050 East to seven lanes
- Add a dedicated right-turn lane for southbound Green Spring Drive at Buena Vista Boulevard
- Widen Telegraph Street/Green Spring Drive intersection
- Widen Telegraph Street to seven lanes
- Widen/improve Telegraph Street/750 West intersection
- Install raised median along portions

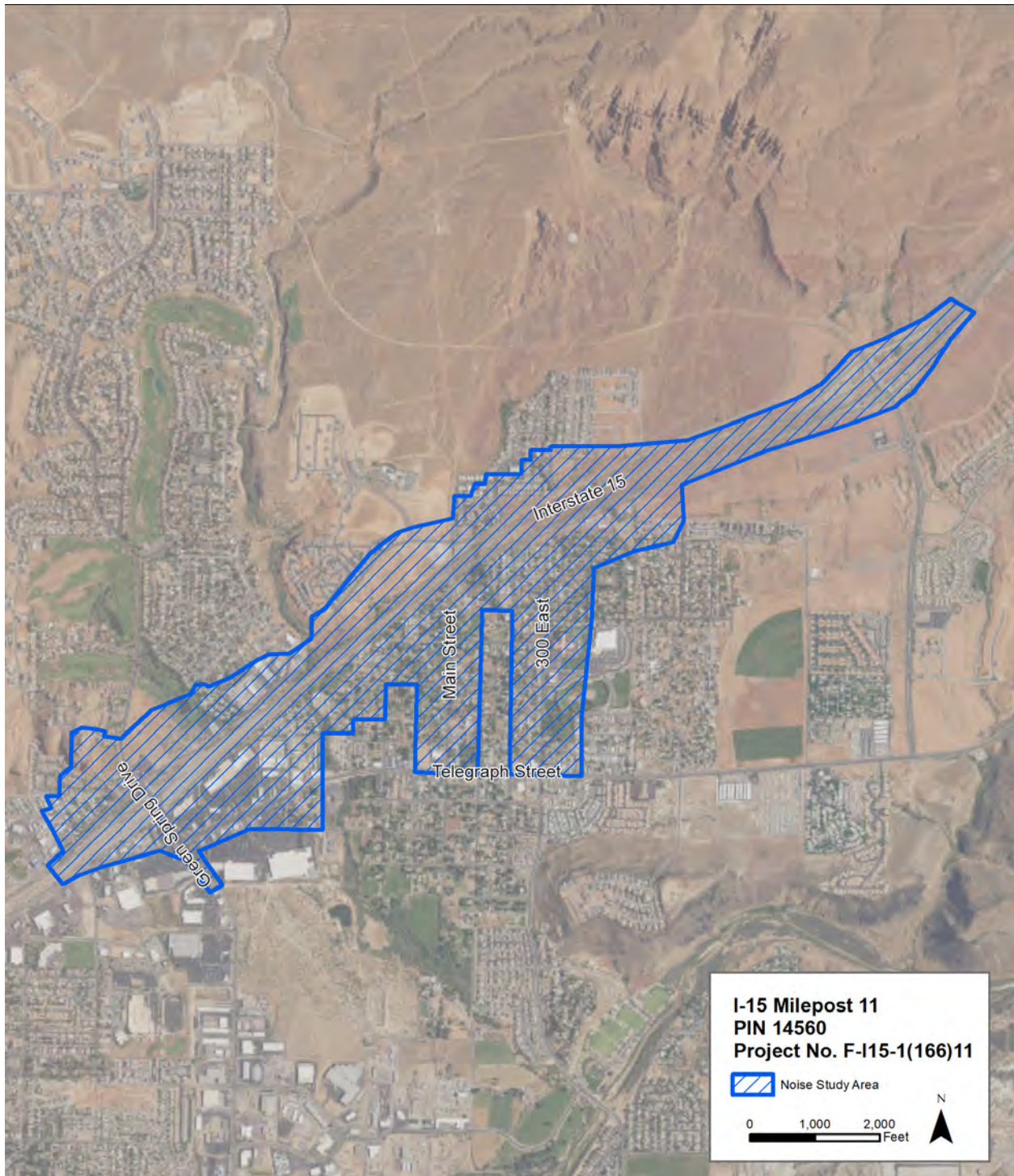


Figure 1 Noise Study Area.



of Telegraph Street and Green
Spring Drive/3050 East

2.1 APPLICABILITY

The UDOT Noise Abatement Policy states that “noise abatement will be considered for all Type I projects where noise impacts are identified.” Type I projects are projects that include any of the following: the construction of a highway at a new location; the physical alteration of an existing highway that substantially alters its alignment; the addition of a through traffic lane; the addition of an auxiliary lane; the addition or relocation of interchange lanes or ramps; or the addition or substantial alteration of a weigh station, rest stop, ride share lot, or toll plaza. Alternatives 4 and 5 are considered Type I projects.

Traffic noise is measured in A-weighted sound levels in decibels (dBA) which most closely approximates the way the human ear hears sounds at different frequencies (see Figure 2). Since traffic noise varies over time, the sound levels for this noise analysis are expressed as “equivalent levels” or Leq, representing the average sound level over a one hour period of time. Unless noted otherwise, all sound levels in this noise analysis are expressed in the hourly equivalent noise level.

2.2 NOISE ABATEMENT CRITERIA

The Federal Highway Administration (FHWA) has established Noise Abatement Criteria for several categories of land use activities (see Table 1). FHWA’s noise criteria is based on sound levels that are considered to be an impact to nearby property owners, also known as receptors. Primary consideration is to be given for exterior areas where frequent human use occurs.

UDOT has developed a Noise Abatement Policy for transportation projects, which conforms to FHWA noise abatement

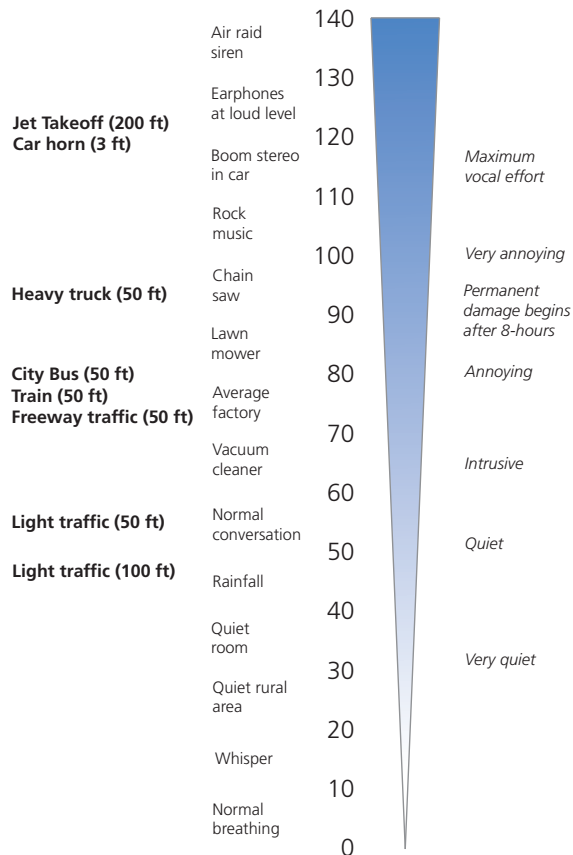


Figure 2 Sound Levels (in dBA) of Common Sounds (Compiled from Federal Transit Administration and Environmental Protection Agency Data)

requirements outlined in 23 CFR §772. 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 Noise Abatement Criteria for specified land use 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.

Noise impact and abatement analyses are required within Land Use Activity Categories A, B, C, D, and E (see Table 1) only when development exists or has been permitted (formal building permit issued prior to the date the final environmental decision document is approved). Activity Categories F and G include lands that are not sensitive to traffic noise. There is no impact criteria for these land use types and an analysis of noise impacts is not required.



Table 1 Noise Abatement Criteria.

ACTIVITY CATEGORY	FHWA CRITERIA LEQ(H)	UDOT CRITERIA LEQ(H)	EVALUATION LOCATION	ACTIVITY DESCRIPTION
A	57	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	67	66	Exterior	Residential.
C	67	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	52	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---	---		Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	---	---		Undeveloped lands that are not permitted.



Table 2 Noise Sensitive Land Uses

ACTIVITY CATEGORY	DESCRIPTION OF LOCATION WITHIN STUDY AREA
A	None
B	<ul style="list-style-type: none"> • Residential neighborhoods within the study area
C	<ul style="list-style-type: none"> • Nisson Park at 30 South 200 West (playground, basketball court, picnic tables) • Washington City Community Center at 501 Park View Drive (swimming pool) • Washington Elementary School at 300 North 300 East (playground) • Community Center Park at 450 Community Center Drive (ball diamonds) • Washington City Cemetery at 300 Park View Drive • Veterans Park at 75 East Telegraph Street (soccer fields) • Washington City Museum 25 East Telegraph Street (outdoor seating area) • Green Spring Golf Course at 588 North Green Spring Drive
D	<ul style="list-style-type: none"> • Southland Bible Church at 195 East Arrowweed Way (interior) • Watch Me Grow Preschool at 122 South 200 West (interior) • Church of Jesus Christ of Latter-Day Saints at 700 East Telegraph Street (interior) • Discovery Clubhouse at 248 Playa Della Rosita (interior) • First Southern Baptist Church at 475 West Buena Vista Blvd (interior) • Church of Jesus Christ of Latter-Day Saints at 486 East Mangum Rd (interior) • Washington Branch Library at 220 North 300 East (interior) • Church of Jesus Christ of Latter-Day Saints at 82 North Main Street (interior) • Hope Organization Non-Profit at 115 North 300 West #101B (interior) • LDS Employment Resource Service Non-Profit at 2480 Red Cliffs Drive (interior)
E	<ul style="list-style-type: none"> • Restaurants, offices, and hotels within the study area
F	<ul style="list-style-type: none"> • Retail Facilities • Self-storage facilities • Agricultural land
G	Undeveloped land within the study area



Table 3 Field Noise Measurements

SITE #	LOCATION	FIELD NOISE LEVEL (DBA)	TNM OUTPUT (DBA)	DIFFERENCE
1	Quality Inn outdoor pool area; 910 West Red Cliffs Drive, Washington, UT	61.0	64.0	-3.0
2	Del Taco outdoor seating area; 832 West Telegraph Street, Washington, UT	68.1	68.9	-0.8
3	Residence; 380 North Barbara Drive, Washington, UT	68.2	68.7	-0.5
4	Residence; 381 North Main Street, Washington, UT	62.9	65.4	-2.5
5	Residence; 135 East Buena Vista Boulevard, Washington, UT	71.2	71.3	-0.1
6	Residence; 501 North 200 East, Washington, UT	71.6	73.5	-1.9
7	Residence; 605 North 300 East, Washington, UT	63.1	65	-1.9
8	Residence; 788 North Gail Way, Washington, UT	68.9	67.6	1.3
9	Residence; 343 East Urie North Drive, Washington, UT	60.6	63.2	-2.6

For the purposes of this noise wall analysis, aerial photography and on-site visits were used to identify existing land uses and structure locations.

2.3 NOISE SENSITIVE LAND USES

Noise sensitive land uses within each of the Activity Categories within the study area can be seen in Table 2.

The UDOT Noise Policy states that a noise impact analysis will not be required for Activity Categories F and G. However, for Activity Category G, an estimate of the distance to the approach criteria must be provided to local governments. See Section 6 of this noise analysis for additional information.

2.4 EXISTING NOISE

The primary source of noise in the study area is automobile and truck traffic from Interstate 15 and other roadways in the area. Existing traffic sound levels for each receptor in the study area were calculated with the Traffic Noise Model (TNM) 2.5 software using existing conditions (travel lane configurations and the posted speed limit). Existing noise levels were determined using the greatest hourly traffic noise condition likely to occur on a regular basis, or Level-of-Service (LOS) C traffic volumes based on roadway capacity.

On-site measurements were taken on October 15–16 and November 2, 2018 with an Extech Instruments SDL600 sound level meter/data logger for a duration of 20 minutes at the locations listed in Table 3 (see Appendix A for data sheets and



noise measurement locations). Recorded measurements were used to verify the accuracy of the noise model and ensure it was representative of existing conditions. To be considered accurate, the field noise measurements must be within 3 dBA of the model's predicted noise.

Of the 750 receptors within the study area, 202 currently experience a noise impact (see Existing Noise Levels maps and tables in Appendix A). The highest calculated noise level was 76.1 dBA at receptor 370 B (see Existing Noise Levels maps and tables in Appendix A). Overall, the average noise level for the study area is 62.1 dBA.

2.5 ALTERNATIVE 4: MAIN STREET INTERCHANGE (PREFERRED ALTERNATIVE)

Projected traffic noise levels for Alternative 4 were calculated with TNM 2.5 software using build conditions (travel lane configurations and traffic volumes). Noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or LOS C traffic volumes.

A total of 408 receptors were analyzed for Alternative 4. These receptors represent parcels adjacent to the Alternative 4 roadway improvements. Alternative 4 would generally result in a 0.6 dBA noise level increase throughout the study area.

The greatest increase in noise would be 5.7 dBA at Receptor 317 (see Alternative 4 Noise Impacts Maps in Appendix B). No receptors experienced a substantial increase in noise, which is defined as a 10 dBA or greater increase over existing noise levels. Of the 408 receptors, 129 would be impacted by Alternative 4 noise levels.

2.6 ALTERNATIVE 5: 300 EAST INTERCHANGE

Projected traffic noise levels for Alternative 5 were calculated with TNM 2.5 software using build conditions (travel lane configurations and traffic volumes). Noise levels were determined using the greatest hourly traffic noise conditions likely to occur on a regular basis, or LOS C traffic volumes.

A total of 447 receptors were analyzed for Alternative 5. These receptors represent parcels adjacent to the Alternative 5 roadway improvements. Alternative 5 would generally result in a 0.4 dBA noise level increase throughout the study area. The greatest increase in noise would be 7.9 dBA at Receptor 617 (see Alternative 5 Noise Impacts Maps in Appendix B). No receptors experienced a substantial increase in noise, which is defined as a 10 dBA or greater increase over existing noise levels. Of the 447 receptors, 95 would be impacted by Alternative 5 noise levels.



2.7 SUMMARY

Refer to tables in Appendix C for summaries of existing and Build Alternatives noise levels for each alternative (the letter on the Map Label represents the activity category). Refer to the maps in Appendix B for receptor locations.

3.0 MITIGATION

According to the UDOT Noise Abatement Policy, specific conditions must be met before traffic noise abatement is implemented. Noise mitigation must be considered feasible and reasonable. The factors considered when determining if mitigation is feasible include:

- **Engineering Considerations:** Engineering considerations such as safety, presence of cross streets, sight distance, access to adjacent properties, wall height, topography, drainage, utilities, maintenance access and maintenance of the abatement measure must be taken into account as part of establishing feasibility. Noise abatement measures are not intended to serve as privacy fences or safety barriers. Abatement measures installed on structures will not exceed 10-feet in height measured from the top of deck or roadway to the top of the noise wall. Noise walls will not be installed on structures that require retrofitting to accommodate the noise abatement measure. Noise abatement measures will be considered if the project meets the criteria established in this policy if structure replacement is included as part of the project. Abatement measures shall be consistent with general American Association of State Highway and Transportation Officials (AASHTO) design principles.
- **Safety on Urban Non-Access Controlled Roadways:** To avoid a damaged wall from becoming a safety hazard, in the event of a failure, wall

height shall be no greater than the distance from the back-of-curb to the face of a proposed wall. Because the distance from the back-of-curb to the face of the proposed wall varies, wall heights which meet this safety requirement may also vary.

- **Acoustic Feasibility:** Noise abatement must be considered “acoustically feasible.” This is defined as achieving at least a 5 dBA highway traffic noise reduction for at least 50% of front-row receptors.

The factors considered when determining if mitigation is reasonable include:

- **Noise Abatement Design Goal:** Every reasonable effort should be made to obtain substantial noise reductions. 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.
- **Cost Effectiveness:** The cost of noise abatement measures must be deemed reasonable in order to be included in the project. Noise abatement costs are based on a fixed unit cost of \$20 per square foot, multiplied by the height and length of the wall, in addition to the cost of any other item associated with the abatement measure that is critical to safety. The fixed unit cost is based on the historical average cost of noise walls installed on UDOT projects and is reviewed at regular intervals, not to exceed five years. The cost effectiveness of abatement is determined by analyzing the cost of a wall that would provide a noise reduction of 5 dBA or more for a benefited receptor. A reasonable cost is considered to be a maximum of \$30,000 per benefited receptor (Activity Category B) and \$360 per lineal foot for Activity Categories A,C,D or E. If the anticipated cost of the noise abatement measure is less than the allowable cost, then the abatement is deemed reasonable.



- **Viewpoints of Property Owners and Residents:** As part of the final design phase, public balloting would take place if noise abatement measures appear to meet the criteria outlined in UDOT's Noise Abatement Policy.

3.1 NOISE BARRIERS

For a sound wall to be effective, it must be high enough and long enough to block the view of the noise source from the receptor's perspective. *The Highway Traffic Noise Analysis and Abatement Policy and Guidance* states that a good rule of thumb is that the noise barrier should extend four times as far in each direction as the distance from the receptor to the barrier. For instance, 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.

Openings in noise walls for driveway and cross street accesses greatly reduce the effectiveness of noise walls. Therefore, impacted receptors with direct access onto local streets (Telegraph Street, Green Spring Drive, Main Street, 300 East, Buena Vista Boulevard, etc.) do not qualify for noise walls.

In an effort to provide an objective analysis of traffic noise reduction to impacted receptors, a variety of noise wall heights were considered. When multiple wall heights met noise abatement requirements, the shortest wall height found to be both feasible and reasonable was recommended for balloting. Noise walls were considered at the following locations:



**Alternative 4: Main Street Interchange
Wall 1**

This wall would be built as three segments and would be located on the north side of Interstate 15 between Milepost 11.3 and Milepost 12.7 (see Alternative 4 Noise Walls Maps in Appendix D). Segment 1 would extend along the I-15 southbound entrance ramp at Main Street. This wall is approximately 3,018 feet in length. Segment 2 would extend along the north side of Interstate 15 between Milepost 11.7 and Milepost 12.2. This wall is approximately 1,899 feet in length.

Segment 3 would extend along the I-15 southbound exit ramp at Main Street. This wall is approximately 3,321 feet in length. (see Alternative 4 Noise Walls Maps in Appendix D). As summarized in Table 4, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 4: Wall 1 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 4 Summary of Alternative 4: Wall 1 (Segment 1, Segment 2, and Segment 3)

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost	Cost Effective? ³	
10	1.8	No	N/A	N/A	N/A	N/A	N/A	No
12 ⁴	18.2	No	N/A	N/A	N/A	N/A	N/A	No
14 ⁴	27.3	No	N/A	N/A	N/A	N/A	N/A	No
16 ⁴	34.5	No	N/A	N/A	N/A	N/A	N/A	No
18 ⁴	43.6	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost

⁴ 10-ft over structure



**Alternative 4: Main Street Interchange
Wall 2**

This wall would be built as three segments and would be located on the south side of Interstate 15 between Milepost 11.2 and Milepost 12.6 (see Alternative 4 Noise Walls Maps in Appendix D). Segment 1 would extend along the I-15 northbound exit ramp at Main Street. This wall is approximately 3,812 feet in length. Segment 2 would extend along the south side of Interstate 15 between Milepost 11.7 and Milepost 12.2. This wall is approximately 1,909 feet in length. Segment 3 would extend along the I-15 northbound entrance ramp at Main Street. This wall is approximately 3,129 feet in length. (see Alternative 4 Noise Walls Maps in Appendix D). As summarized in Table 5, walls ranging in height from 10 to 18 feet were evaluated.

- **Acoustic Feasibility:** A 12 foot to 18 foot wall would provide a 5 dBA reduction to at least 50% of front row receptors.
- **Noise Abatement Design Goal:** A 12 foot to 18 foot wall would provide a 7 dBA reduction to at least 35% of front row receptors.
- **Cost Effectiveness:** The anticipated cost of a 12 foot to 18 foot wall is less than the allowable cost.

Therefore, a 12 foot to 18 foot wall, in this area is considered both feasible and reasonable (see Appendix E for detailed wall analyses). A 12 foot tall wall for Alternative 4: Wall 2 is recommended for balloting because it is the shortest wall height found to be both feasible and reasonable.

Table 5 Summary of Alternative 4 :Wall 2 (Segment 1, Segment 2, and Segment 3)

BARRIER HEIGHT	FEASIBILITY		REASONABLE			IS BARRIER FEASIBLE & REASONABLE?		
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost		Allowable Cost	Cost Effective? ³
10	48.8	No	16.3	No	N/A	N/A	No	No
12 ⁴	81.4	Yes	41.9	Yes	\$1,764,720	\$2,880,000	Yes	Yes
14 ⁴	81.4	Yes	65.1	Yes	\$2,058,840	\$3,330,000	Yes	Yes
16 ⁴	81.4	Yes	76.7	Yes	\$2,352,960	\$3,690,000	Yes	Yes
18 ⁴	95.3	Yes	76.7	Yes	\$2,647,080	\$3,960,000	Yes	Yes

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost

⁴ 10-ft over structure



Alternative 4: Main Street Interchange
Wall 3

This wall would be located on the south side of Interstate 15 and west of Green Spring Drive, between 880 West and 980 West (see Alternative 4 Noise Walls Maps in Appendix D). The wall is approximately 378 feet in length.

None of the wall heights evaluated for Alternative 4: Wall 3 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 6 Summary of Alternative 4: Wall 3

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	<u>% front-row with 5 dBA reduction</u>	<u>Acoustically feasible?¹</u>	<u>% front-row with 7 dBA reduction</u>	<u>Noise Abatement Design Goal?²</u>	<u>Anticipated Cost</u>	<u>Allowable Cost</u>	<u>Cost Effective?³</u>	
10	0.0	No	N/A	N/A	N/A	N/A	N/A	No
12	0.0	No	N/A	N/A	N/A	N/A	N/A	No
14	0.0	No	N/A	N/A	N/A	N/A	N/A	No
16	0.0	No	N/A	N/A	N/A	N/A	N/A	No
18	0.0	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



Alternative 4: Main Street Interchange

Wall 4

This wall would be located on the north side of Buena Vista Boulevard, east of Warm Spring Drive, and west of Graham Manor (see Alternative 4 Noise Walls Maps in Appendix D). The wall is approximately 781 feet in length. As summarized in Table 7, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 4: Wall 4 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 7 Summary of Alternative 4: Wall 4

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost	Cost Effective? ³	
10	14.3	No	N/A	N/A	N/A	N/A	N/A	No
12	14.3	No	N/A	N/A	N/A	N/A	N/A	No
14	14.3	No	N/A	N/A	N/A	N/A	N/A	No
16	28.6	No	N/A	N/A	N/A	N/A	N/A	No
18	42.9	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



Alternative 4: Main Street Interchange
Wall 5

This wall would be located on the north side of Buena Vista Boulevard, east of Creek Ridge Drive, and west of Millcreek Springs Drive (see Alternative 4 Noise Walls Maps in Appendix D). The wall is approximately 596 feet in length. As summarized in Table 8, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 4: Wall 5 were found to be feasible and reasonable (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 8 Summary of Alternative 4: Wall 5

BARRIER HEIGHT	FEASIBILITY		REASONABLE				IS BARRIER FEASIBLE & REASONABLE?	
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost		Cost Effective? ³
10	12.5	No	N/A	N/A	N/A	N/A	N/A	No
12	50.0	Yes	12.5	No	N/A	N/A	N/A	No
14	75.0	Yes	12.5	No	N/A	N/A	N/A	No
16	87.5	Yes	12.5	No	N/A	N/A	N/A	No
18	100.0	Yes	12.5	No	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



Alternative 4: Main Street Interchange

Wall 6

This wall would be located on the north side of Buena Vista Boulevard, east of Calle Del Sol, and west of Creek Ridge Drive (see Alternative 4 Noise Walls Maps in Appendix D). The wall is approximately 526 feet in length. As summarized in Table 9, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 4: Wall 6 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 9 Summary of Alternative 4: Wall 6

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost	Cost Effective? ³	
10	0.0	No	N/A	N/A	N/A	N/A	N/A	No
12	0.0	No	N/A	N/A	N/A	N/A	N/A	No
14	0.0	No	N/A	N/A	N/A	N/A	N/A	No
16	0.0	No	N/A	N/A	N/A	N/A	N/A	No
18	33.3	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



Alternative 5: 300 East Interchange

Wall 1

This wall would be built as three segments and would be located on the north side of Interstate 15 between Milepost 12 and Milepost 12.8. (see Alternative 5 Noise Walls Maps in Appendix D). Segment 1 would extend along the I-15 southbound entrance ramp at 300 East. This wall is approximately 1,282 feet in length. Segment 2 would extend along the north side of Interstate 15 between Milepost 12 and Milepost 12.6. This wall is approximately 2,643 feet in length. Segment 3 would extend along

the I-15 southbound exit ramp at 300 East. This wall is approximately 2,395 feet in length. (see Alternative 5 Noise Walls Maps in Appendix D). As summarized in Table 10, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 5: Wall 1 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 10 Summary of Alternative 5: Wall 1 (Segment 1, Segment 2, and Segment 3)

BARRIER HEIGHT	FEASIBILITY		REASONABLE				IS BARRIER FEASIBLE & REASONABLE?	
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost		Cost Effective? ³
10	0.0	No	N/A	N/A	N/A	N/A	N/A	No
12 ⁴	0.0	No	N/A	N/A	N/A	N/A	N/A	No
14 ⁴	4.0	No	N/A	N/A	N/A	N/A	N/A	No
16 ⁴	12.0	No	N/A	N/A	N/A	N/A	N/A	No
18 ⁴	12.0	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost

⁴ 10-ft over structure



Alternative 5: 300 East Interchange

Wall 2

This wall would be built as three segments and would be located on the south side of Interstate 15 between Milepost 11.6 and Milepost 12.6 (see Alternative 5 Noise Walls Maps in Appendix D). Segment 1 would extend along the I-15 northbound exit ramp at 300 East. This wall is approximately 3,307 feet in length. Segment 2 would extend along the south side of Interstate 15 between Milepost 12 and Milepost 12.6. This wall is approximately 2,704 feet in length. Segment 3 would extend along the I-15 northbound entrance ramp at 300 East. This wall is approximately 1,261 feet in length. (see Alternative 5 Noise Walls Maps in Appendix D). As summarized in Table 11, walls ranging in height from 10 to 18 feet were evaluated.

- **Acoustic Feasibility:** A 10 foot to 18 foot wall would provide a 5 dBA reduction to at least 50% of front row receptors.
- **Noise Abatement Design Goal:** A 12 foot to 18 foot wall would provide a 7 dBA reduction to at least 35% of front row receptors.
- **Cost Effectiveness:** The anticipated cost of a 12 foot to 18 foot wall is less than the allowable cost.

Therefore, a 12 foot to 18 foot wall, in this area is considered feasible and reasonable (see Appendix E for detailed wall analyses). A 12 foot tall wall for Alternative 5: Wall 2 is recommended for balloting because it is the shortest wall height found to be both feasible and reasonable.

Table 11 Summary of Alternative 5: Wall 2 (Segment 1, Segment 2, and Segment 3)

BARRIER HEIGHT	FEASIBILITY		REASONABLE				IS BARRIER FEASIBLE & REASONABLE?	
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost		Cost Effective? ³
10	51.4	Yes	25.7	No	N/A	N/A	No	No
12 ⁴	74.3	Yes	48.6	Yes	\$1,745,280	\$2,010,000	Yes	Yes
14 ⁴	94.3	Yes	77.1	Yes	\$2,036,160	\$2,850,000	Yes	Yes
16 ⁴	94.3	Yes	88.6	Yes	\$2,327,040	\$2,940,000	Yes	Yes
18 ⁴	94.3	Yes	91.4	Yes	\$2,617,920	\$3,030,000	Yes	Yes

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost

⁴ 10-ft over structure



Alternative 5: 300 East Interchange

Wall 3

This wall would be located on the south side of Interstate 15 and west of Green Spring Drive, between 880 West and 980 West (see Alternative 5 Noise Walls Maps in Appendix D). The wall is approximately 378 feet in length. As summarized in Table 12, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 5: Wall 3 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 12 Summary of Alternative 5: Wall 3

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	<u>% front-row with 5 dBA reduction</u>	<u>Acoustically feasible?¹</u>	<u>% front-row with 7 dBA reduction</u>	<u>Noise Abatement Design Goal?²</u>	<u>Anticipated Cost</u>	<u>Allowable Cost</u>	<u>Cost Effective?³</u>	
10	0.0	No	N/A	N/A	N/A	N/A	N/A	No
12	0.0	No	N/A	N/A	N/A	N/A	N/A	No
14	0.0	No	N/A	N/A	N/A	N/A	N/A	No
16	0.0	No	N/A	N/A	N/A	N/A	N/A	No
18	0.0	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



Alternative 5: 300 East Interchange

Wall 4

This wall would be located on the north side of Buena Vista Boulevard, east of Warm Spring Drive, and west of Graham Manor (see Alternative 4 Noise Walls Maps in Appendix D). The wall is approximately 811 feet in length. As summarized in Table 13, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 4: Wall 4 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 13 Summary of Alternative 5: Wall 4

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost	Cost Effective? ³	
10	0.0	No	N/A	N/A	N/A	N/A	N/A	No
12	0.0	No	N/A	N/A	N/A	N/A	N/A	No
14	0.0	No	N/A	N/A	N/A	N/A	N/A	No
16	0.0	No	N/A	N/A	N/A	N/A	N/A	No
18	0.0	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



Alternative 5: 300 East Interchange

Wall 5

This wall would be located on the north side of Buena Vista Boulevard, east of Calle Del Sol, and west of Creek Ridge Drive (see Alternative 5 Noise Walls Maps in Appendix D). The wall is approximately 526 feet in length. As summarized in Table 14, walls ranging in height from 10 to 18 feet were evaluated.

None of the wall heights evaluated for Alternative 5: Wall 5 were found to be acoustically feasible (see Appendix E for detailed wall analyses). Therefore, a wall at this location is not recommended for balloting.

Table 14 Summary of Alternative 5: Wall 5

BARRIER HEIGHT	FEASIBILITY		REASONABLE					IS BARRIER FEASIBLE & REASONABLE?
	% front-row with 5 dBA reduction	Acoustically feasible? ¹	% front-row with 7 dBA reduction	Noise Abatement Design Goal? ²	Anticipated Cost	Allowable Cost	Cost Effective? ³	
10	0.0	No	N/A	N/A	N/A	N/A	N/A	No
12	0.0	No	N/A	N/A	N/A	N/A	N/A	No
14	0.0	No	N/A	N/A	N/A	N/A	N/A	No
16	33.3	No	N/A	N/A	N/A	N/A	N/A	No
18	33.3	No	N/A	N/A	N/A	N/A	N/A	No

¹ 5 dBA reduction for at least 50% of front-row receptors

² 7 dBA for at least 35% of front-row receptors

³ Anticipated cost is less than allowable cost



4.0 CONSTRUCTION IMPACTS

Construction noise impacts are considered temporary and will be minimized through adherence to UDOT Standard Specification 01355 Environmental Compliance, Part 3.6 - Noise Control. Extended disruption of normal activities is not anticipated, since no receptors are expected to be exposed to construction noise for a long duration of time.

5.0 INFORMATION FOR LOCAL OFFICIALS

According to the UDOT Noise Abatement Policy, an estimated distance from the edge of pavement to where the worst hour Leq(h) levels of 66 dBA and 71 dBA occurs must be provided to local governments for land uses with Activity Category G. Within the study area there is a large parcel of undeveloped private land on the north side of I-15 between Main Street and Calle Del Sol. Projected traffic noise levels from the edge of pavement to a level of 66 dBA and 71 dBA would occur at 300 feet and 100 feet, respectively (see Appendix F).

6.0 CONCLUSION

Alternative 4: Main Street Interchange

Alternative 4 would generally result in a 0.6 dBA noise level increase throughout the study area. Of the 408 receptors, 132 would be impacted by Alternative 4 noise levels. One noise wall associated with this alternative would meet the requirements of the UDOT Noise Abatement Policy.

This wall would be built as three segments and would be located on the south side of Interstate 15 between Milepost 11.2 and Milepost 12.6 (see Alternative 4 Noise Walls Maps in Appendix D). Segment 1 would extend along the I-15 northbound exit ramp at Main Street. Segment 2 would extend along the south side of Interstate

15 between Milepost 11.7 and Milepost 12.2. Segment 3 would extend along the I-15 northbound entrance ramp at Main Street. As part of the final design phase, UDOT will conduct balloting consistent with the procedures described in UDOT's Noise Abatement Policy.

Alternative 5: 300 East Interchange

Alternative 5 would generally result in a 0.4 dBA noise level increase throughout the study area. Of the 447 receptors, 111 would be impacted by Alternative 5 noise levels. One noise wall associated with this alternative would meet the requirements of the UDOT Noise Abatement Policy.

This wall would be built as three segments and would be located on the south side of Interstate 15 between Milepost 11.6 and Milepost 12.6 (see Alternative 5 Noise Walls Maps in Appendix D). Segment 1 would extend along the I-15 northbound exit ramp at 300 East. Segment 2 would extend along the south side of Interstate 15 between Milepost 12 and Milepost 12.6. Segment 3 would extend along the I-15 northbound entrance ramp at 300 East. As part of the final design phase, UDOT will conduct balloting consistent with the procedures described in UDOT's Noise Abatement Policy.



APPENDIX A: NOISE MEASUREMENT DATA AND EXISTING NOISE IMPACTS

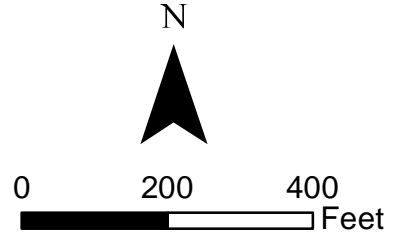


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 1 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site





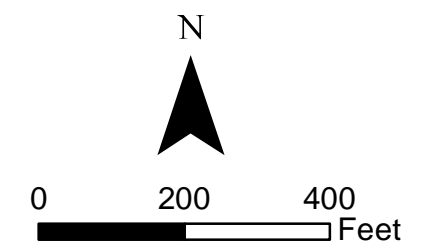
	1	2	
	3	4	
5	6	7	
8	9	10	11
12	13	14	15
16	17		

I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 2 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



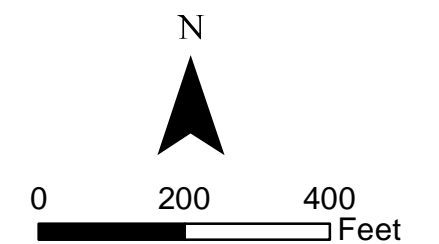


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 3 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



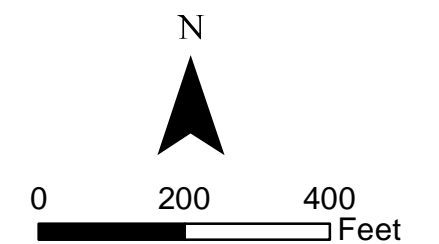


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 4 of 17

Existing Noise Impact

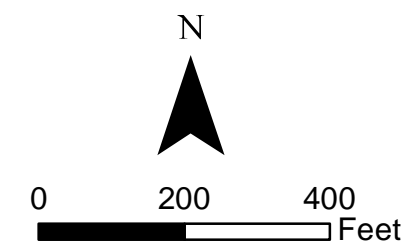
- Yes
- No
- Noise Measurement Site





Existing Noise Impact

- Yes
- No
- Noise Measurement Site



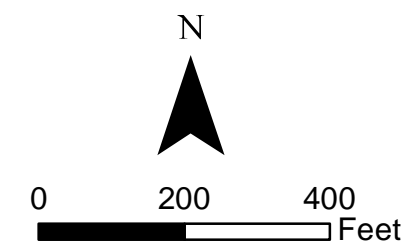


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 6 of 17

Existing Noise Impact

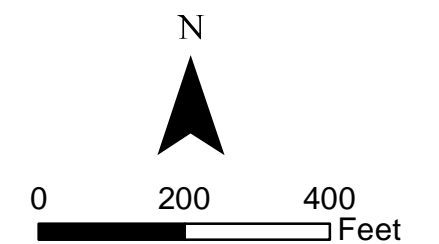
- Yes
- No
- Noise Measurement Site





Existing Noise Impact

- Yes
- No
- Noise Measurement Site





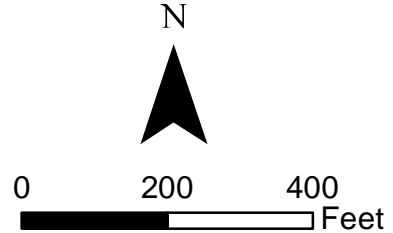
		1	2
		3	4
	5	6	7
8	9	10	11
12	13	14	15
16	17		

I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 8 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



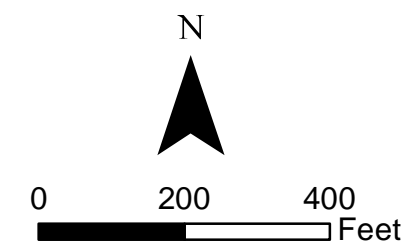


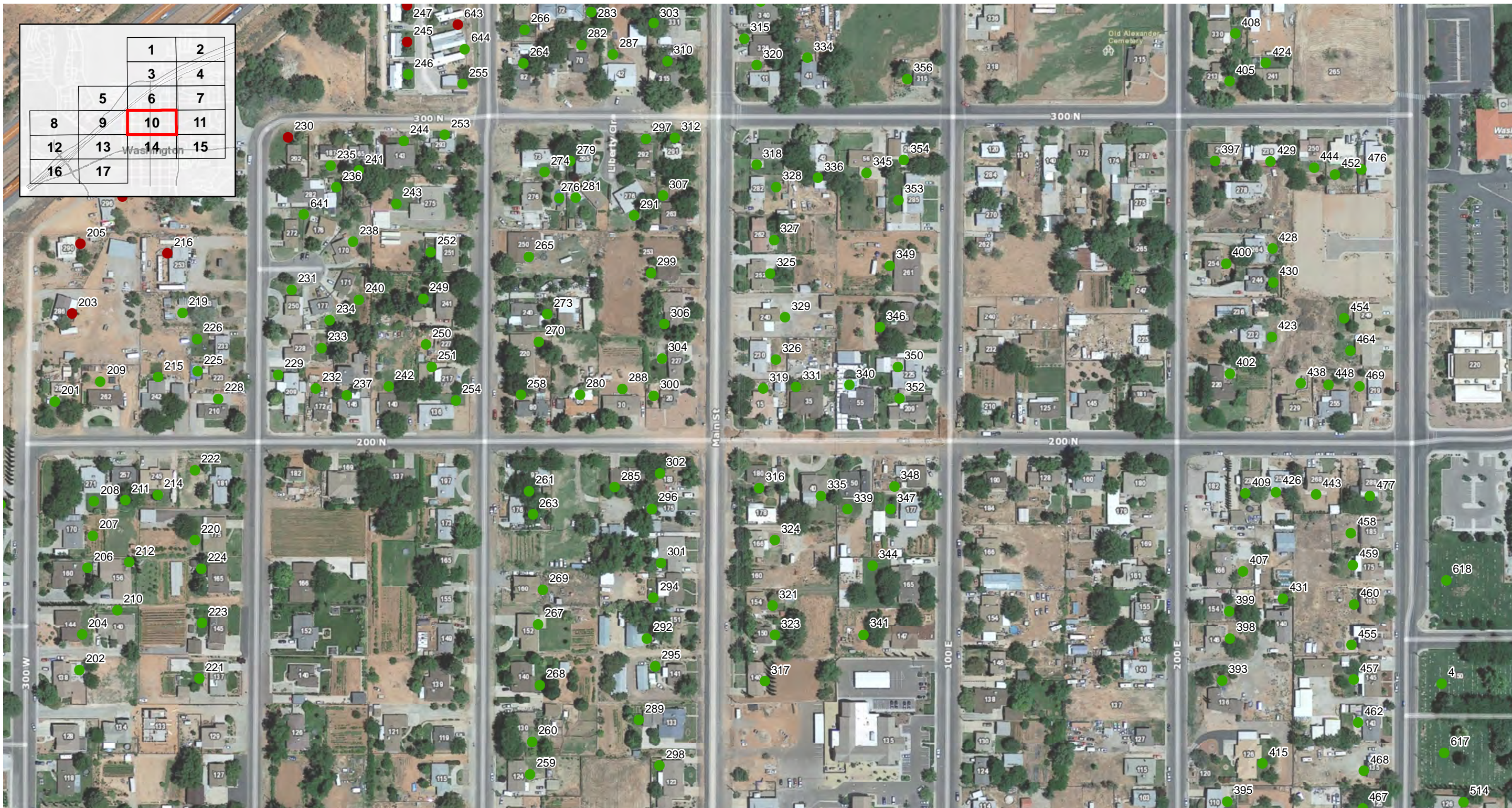
I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 9 of 17

Existing Noise Impact

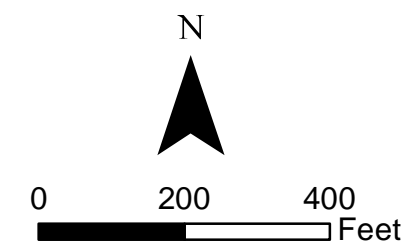
- Yes
- No
- Noise Measurement Site





Existing Noise Impact

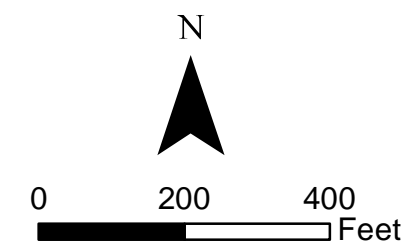
- Yes
- No
- Noise Measurement Site





Existing Noise Impact

- Yes
- No
- Noise Measurement Site



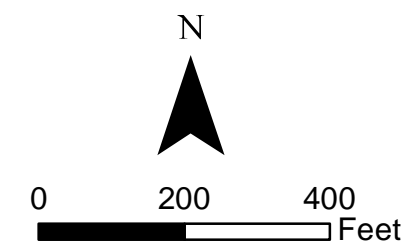


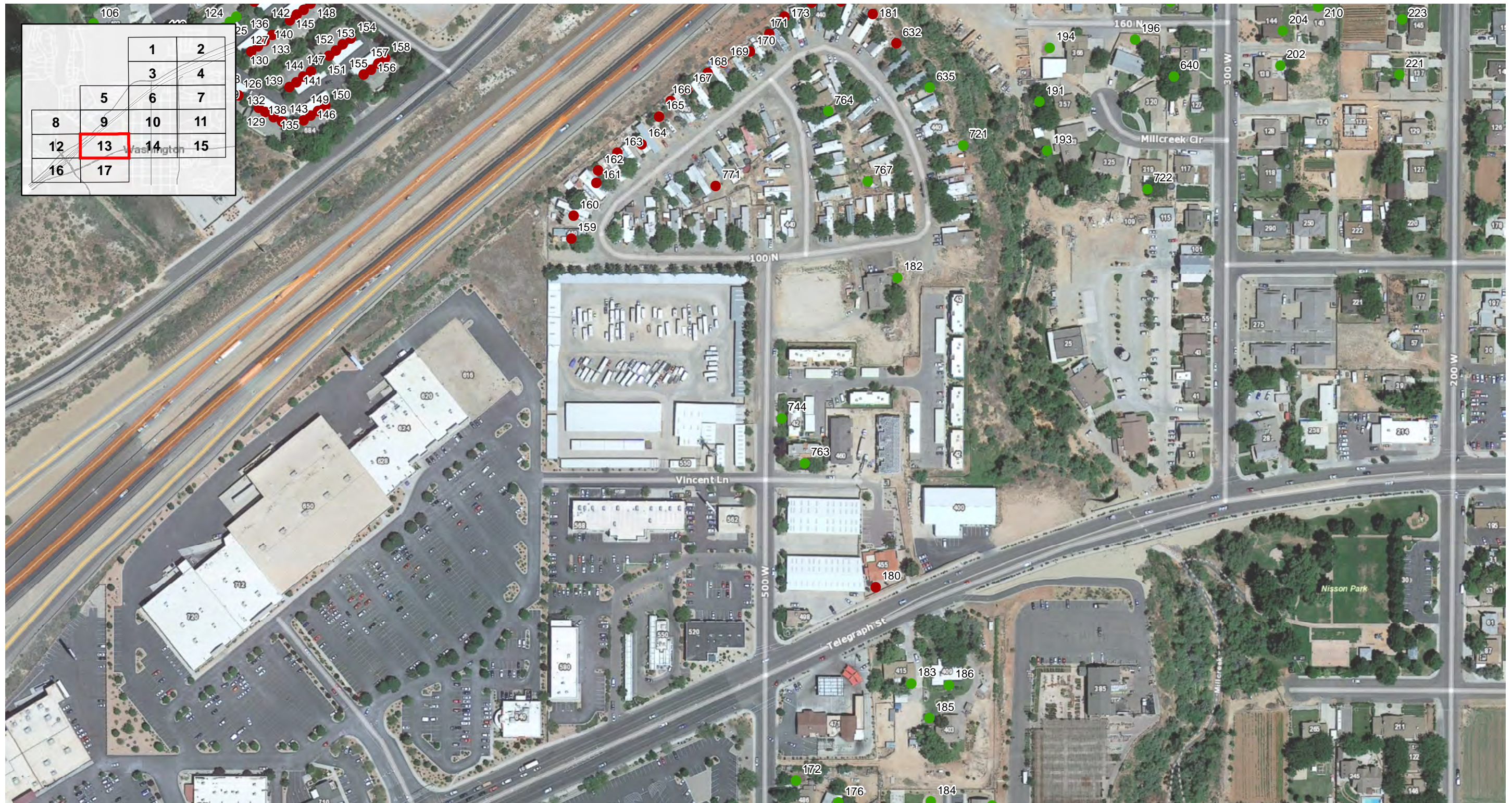
I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 12 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



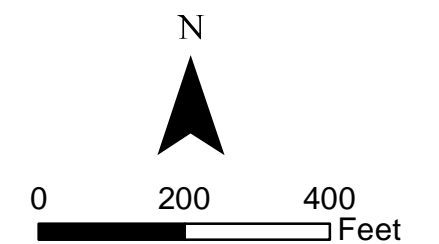


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 13 of 17

Existing Noise Impact

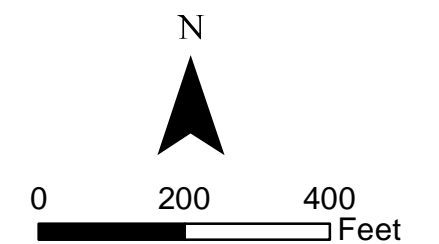
- Yes
- No
- Noise Measurement Site





Existing Noise Impact

- Yes
- No
- Noise Measurement Site



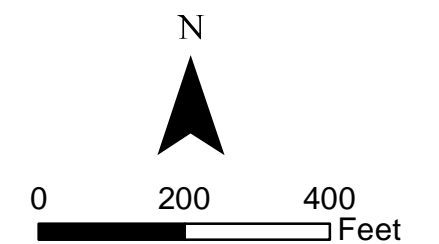


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 15 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



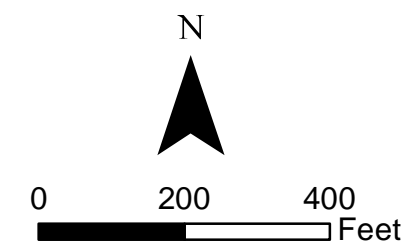


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 16 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



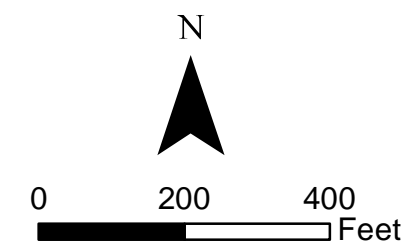


 **I-15 MP 11 INTERCHANGE**
ENVIRONMENTAL STUDY

Existing Noise Impacts
Map 17 of 17

Existing Noise Impact

- Yes
- No
- Noise Measurement Site



To: Elisa Albury, UDOT Environmental Program Manager
From: Nicole Tolley, Environmental Specialist
Date: September 28, 2018
Subject: I-15 MP 11 Interchange Environmental Impact Statement
PIN: 14560, Project No.: F-I15-1(166)11

Memorandum

Noise Monitoring Location Memo

Introduction

UDOT, in conjunction with Washington City, is preparing an Environmental Impact Statement (EIS) to evaluate the current and future transportation and safety needs at Interstate 15 (I-15)/Green Spring Drive Interchange (Exit 10) and the surrounding roadway system in Washington City, Utah. The study area is along I-15 between approximately milepost 10 to 13, on Green Spring Drive between Shadow Ridge Drive and Telegraph Street, Main Street between Buena Vista Boulevard and 300 North, and 300 East between Buena Vista Boulevard and 500 North (see attached study area map). The study includes the No-action Alternative and six build alternatives including:

- Alternative 1 – Widening of northbound Green Spring Drive to four lanes.
- Alternative 2 – Addition of a one-way frontage road system between Exit 10 and Exit 13 interchanges.
- Alternative 3 – Grade separate Green Spring Drive and Telegraph Street (Telegraph Street over).
- Alternative 4 – Construction of a new interchange with entrance/exit ramps from I-15 to Main Street.
- Alternative 5 – Construction of a new interchange with entrance/exit ramps from I-15 to 300 East.
- Alternative 6 – Construction of thru-turns at Green Spring Drive and Telegraph Street.

In accordance with the UDOT Noise Abatement Policy, this project is a Type I Project and requires a traffic noise analysis.

Noise Sensitive Land Uses

Noise sensitive land uses include land uses within Activity Categories A, B, C, D, and E. See Table 1 for a description of the noise sensitive land uses within the study area. See attached Activity Categories and Noise Monitoring Site Maps for the activity categories where the study team is proposing to take noise measurements.

Table 1: Description of Activity Categories within the Study Area

Activity Category	Description of Location within Study Area
A	<ul style="list-style-type: none"> • None
B	<ul style="list-style-type: none"> • Residential neighborhoods within the study area
C	<ul style="list-style-type: none"> • Nisson Park at 30 South 200 West (playground, basketball court, picnic tables) • Washington City Community Center at 501 Park View Drive (swimming pool) • Washington Elementary School at 300 North 300 East (playground) • Community Center Park at 450 Community Center Drive (ball diamonds) • Washington City Cemetery at 300 Park View Drive • Veterans Park at 75 East Telegraph Street (soccer fields) • Washington City Museum 25 East Telegraph Street (outdoor seating area) • Green Spring Golf Course at 588 North Green Spring Drive
D	<ul style="list-style-type: none"> • Southland Bible Church at 195 East Arrowweed Way (interior) • Watch Me Grow Preschool at 122 South 200 West (interior) • Church of Jesus Christ of Latter-Day Saints at 700 East Telegraph Street (interior) • Discovery Clubhouse at 248 Playa Della Rosita (interior) • First Southern Baptist Church at 475 West Buena Vista Blvd (interior) • Church of Jesus Christ of Latter-Day Saints at 486 East Mangum Rd (interior) • Washington Branch Library at 220 North 300 East (interior) • Church of Jesus Christ of Latter-Day Saints at 82 North Main Street (interior) • Hope Organization Non-Profit at 115 North 300 West #101B (interior) • LDS Employment Resource Service Non-Profit at 2480 Red Cliffs Drive (interior)
E	<ul style="list-style-type: none"> • Restaurants, offices, and hotels within the study area
F (noise impact analysis not required)	<ul style="list-style-type: none"> • Retail Facilities • Self-storage facilities • Agricultural land
G (noise impact analysis not required)	<ul style="list-style-type: none"> • Undeveloped land within the study area

Noise Monitoring Sites

Noise measurements are proposed at nine sites along the study corridor (see Activity Categories and Noise Monitoring Sites Maps and Table 2). These measurements will be used to create a validated traffic noise model for noise-sensitive areas near the project. Noise-sensitive areas are defined as areas where frequent exterior human use occurs and where a lowered noise level would be of benefit.

Table 2: Noise Monitoring Sites

Map ID	Activity Category	Address and Description of Site
M1	E	Hotel outdoor pool area; 910 West Red Cliffs Drive, Washington, UT
M2	E	Restaurant outdoor seating area; 832 West Telegraph Street, Washington, UT
M3	B	Residence; 380 North Barbara Drive, Washington, UT
M4	B	Residence; 381 North Main Street, Washington, UT
M5	B	Residence; 135 East Buena Vista Boulevard, Washington, UT
M6	B	Residence; 501 North 200 East, Washington, UT
M7	B	Residence; 605 North 300 East, Washington, UT
M8	B	Residence; 788 North Gail Way, Washington, UT
M9	B	Residence; 343 East Urie North Drive, Washington, UT

Noise Measurement Procedures

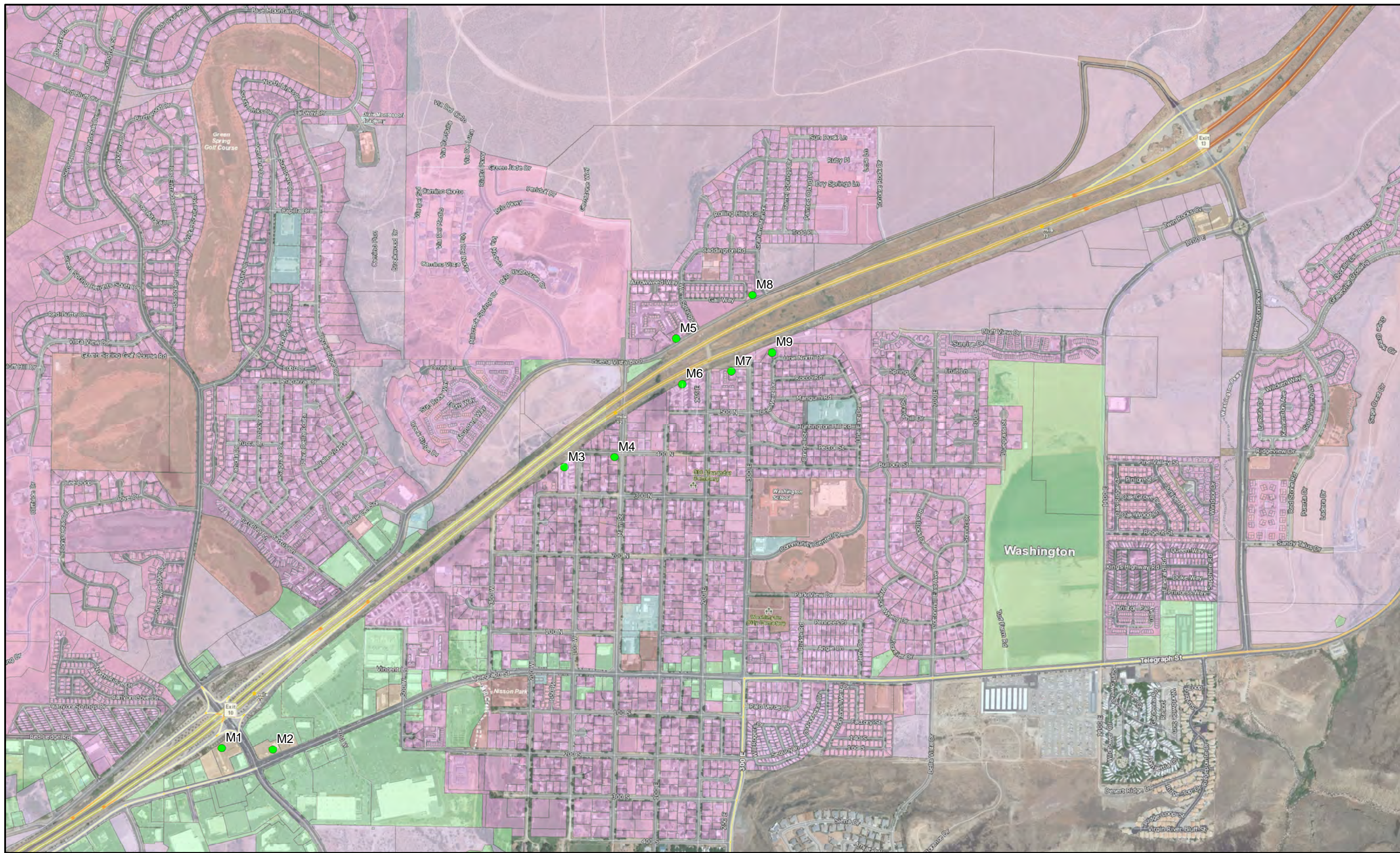
Noise measurements will be taken with an Extech Instruments SDL600 sound level meter/data logger for a duration of 20 minutes at each location. Data will be gathered for noise measurements to construct a validated noise model, including collecting traffic volumes (from UDOT Performance Measurement System, measurement site traffic counts, and mobile traffic cameras), vehicle mixes (defined by axles), and speeds; noting weather conditions; recording foliage types and density; identifying noise sources other than traffic; and recording any abnormal events which, if included in the data, would skew the results. Sketches showing monitoring locations will be prepared and photographs of the measurement area will be taken.

Noise Modeling Procedures

Noise modeling will be completed using the FHWA’s Traffic Noise Model (TNM, v2.5) since the newer version of TNM (v3.0) is not currently available for use at this time.

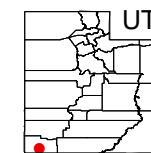
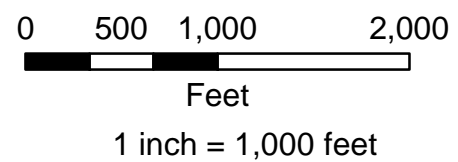
UDOT Noise Policy

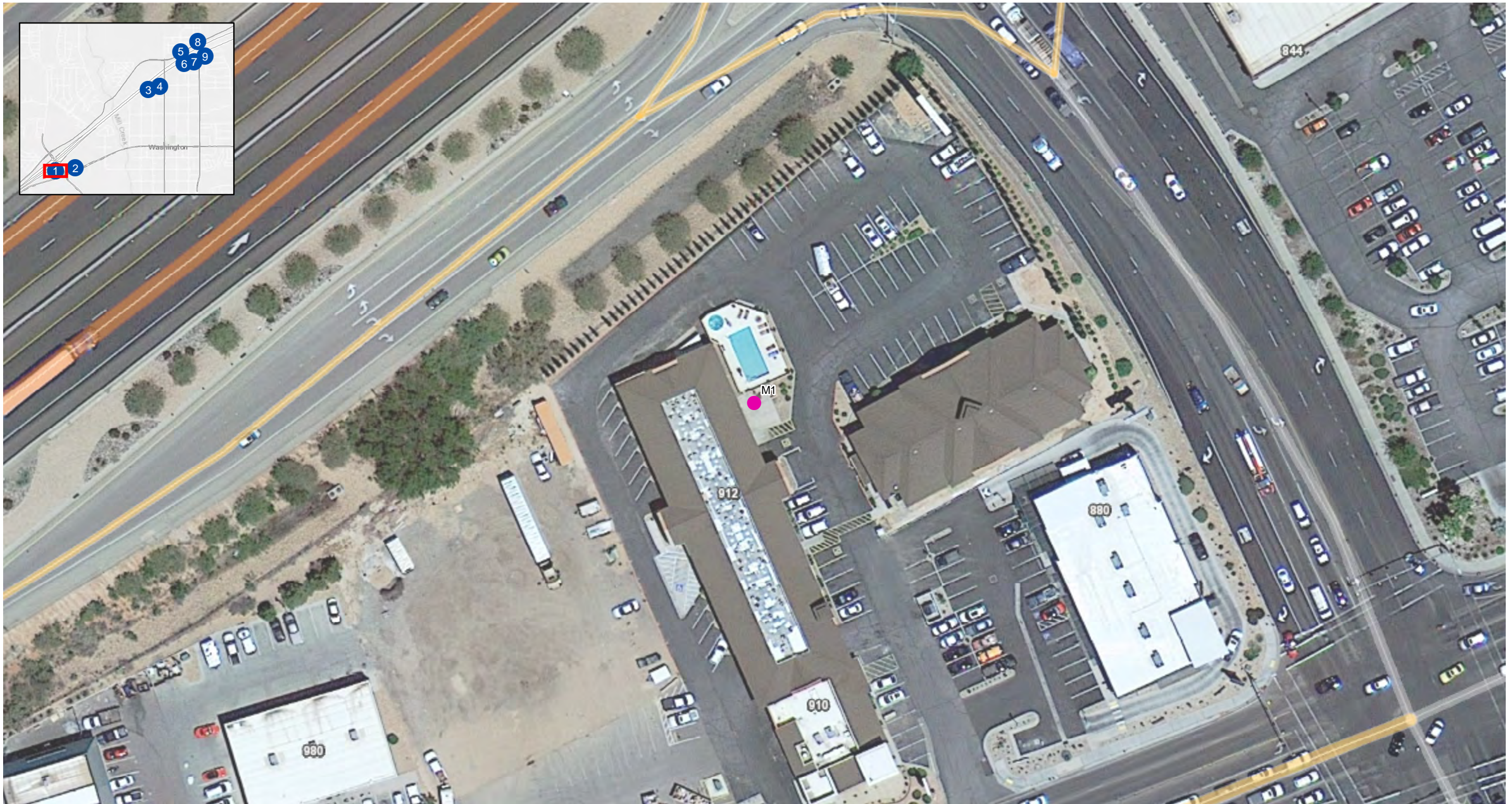
The noise analysis will comply with the most recent version of the UDOT Noise Abatement Policy released June 2017.



● Measurement Location

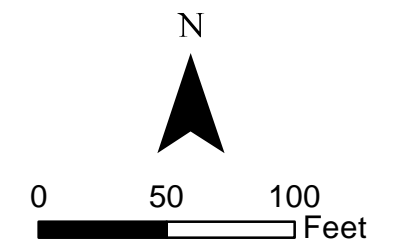
Activity Category		
B	D	F
C	E	G

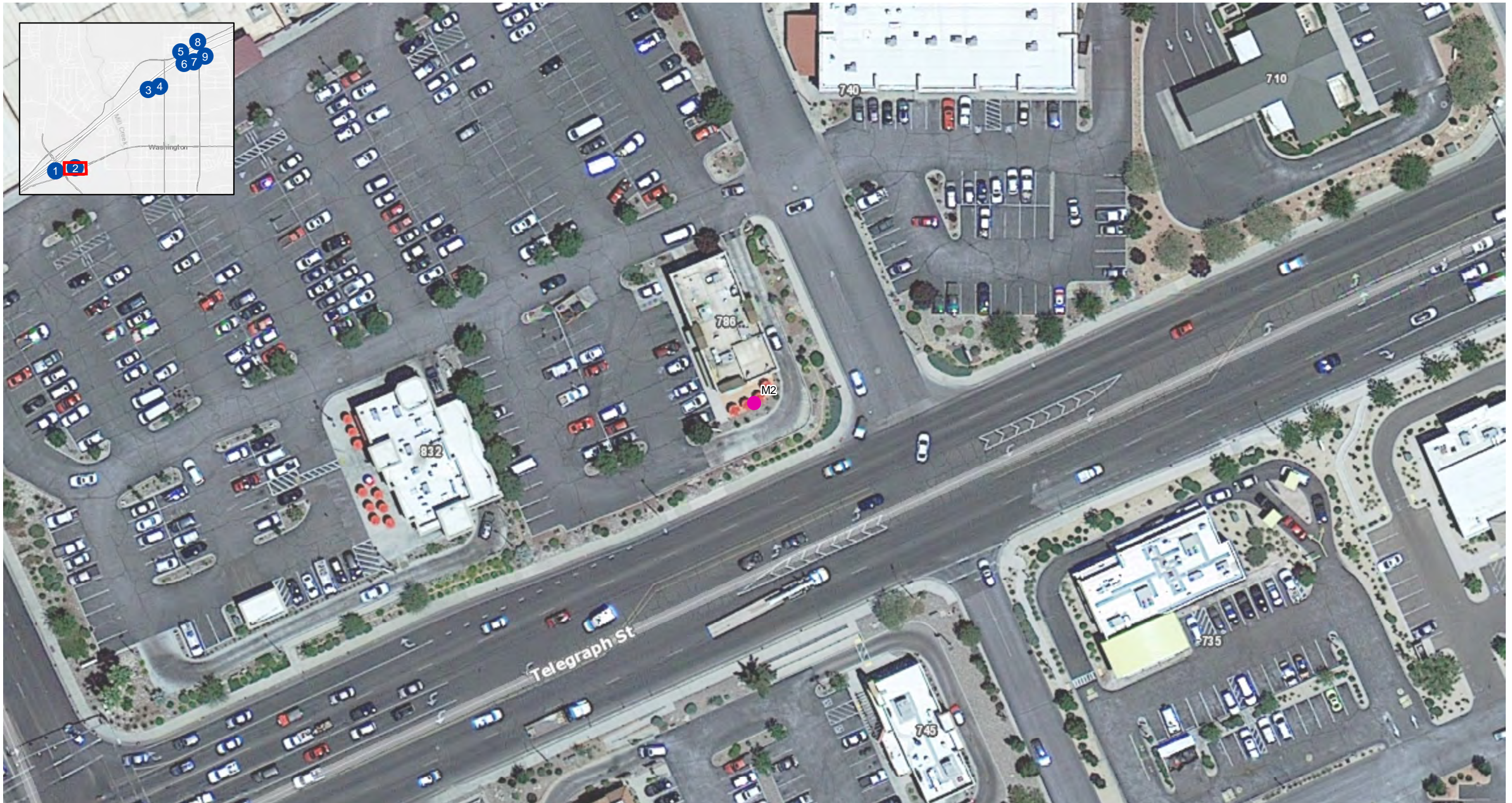




Measurement Activity Category

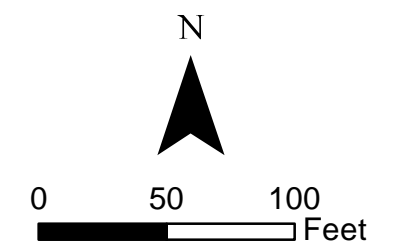
- B
- E





Measurement Activity Category

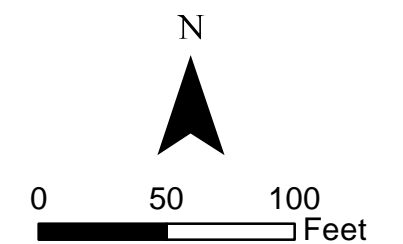
- B
- E





Measurement Activity Category

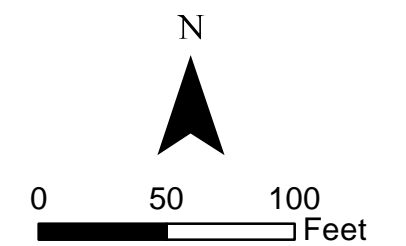
- B
- E





Measurement Activity Category

- B
- E



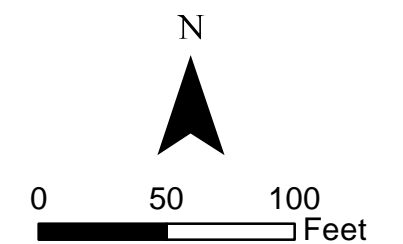


 **I-15 MP 11 INTERCHANGE**
ENVIRONMENTAL STUDY

Activity Category & Noise Monitoring Sites
Map 5 of 9

Measurement Activity Category

- B
- E

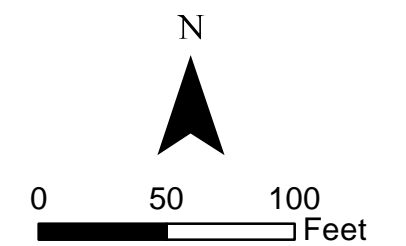




Activity Category & Noise Monitoring Sites
Map 6 of 9

Measurement Activity Category

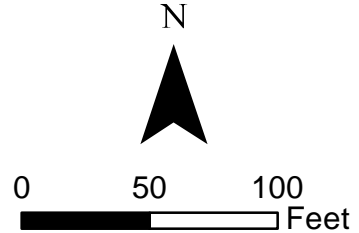
- B
- E





Measurement Activity Category

- B
- E



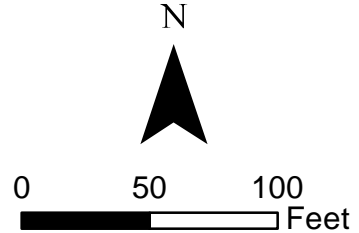


I-15 MP 11 INTERCHANGE
ENVIRONMENTAL STUDY

Activity Category & Noise Monitoring Sites
Map 8 of 9

Measurement Activity Category

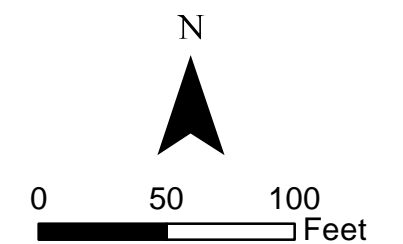
- B
- E



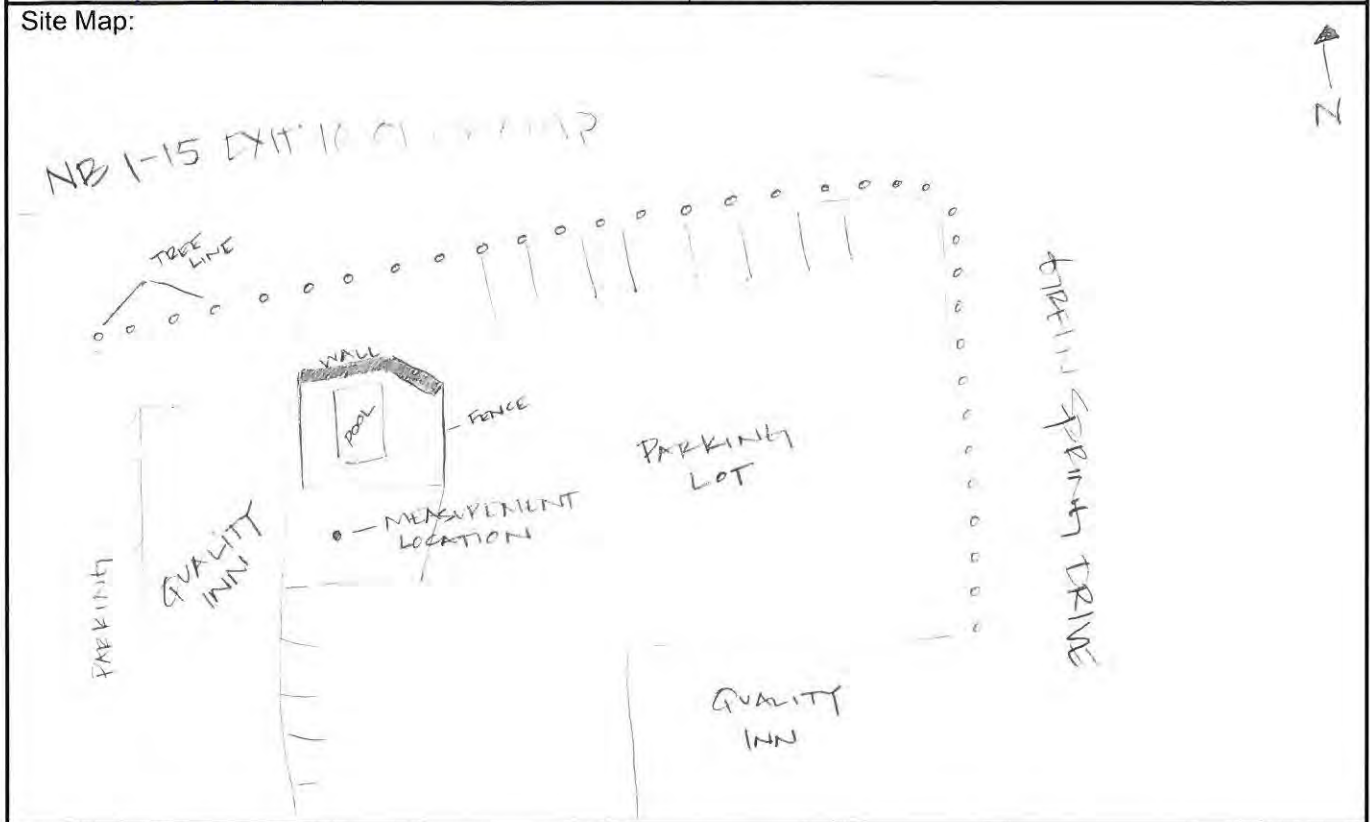


Measurement Activity Category

- B
- E



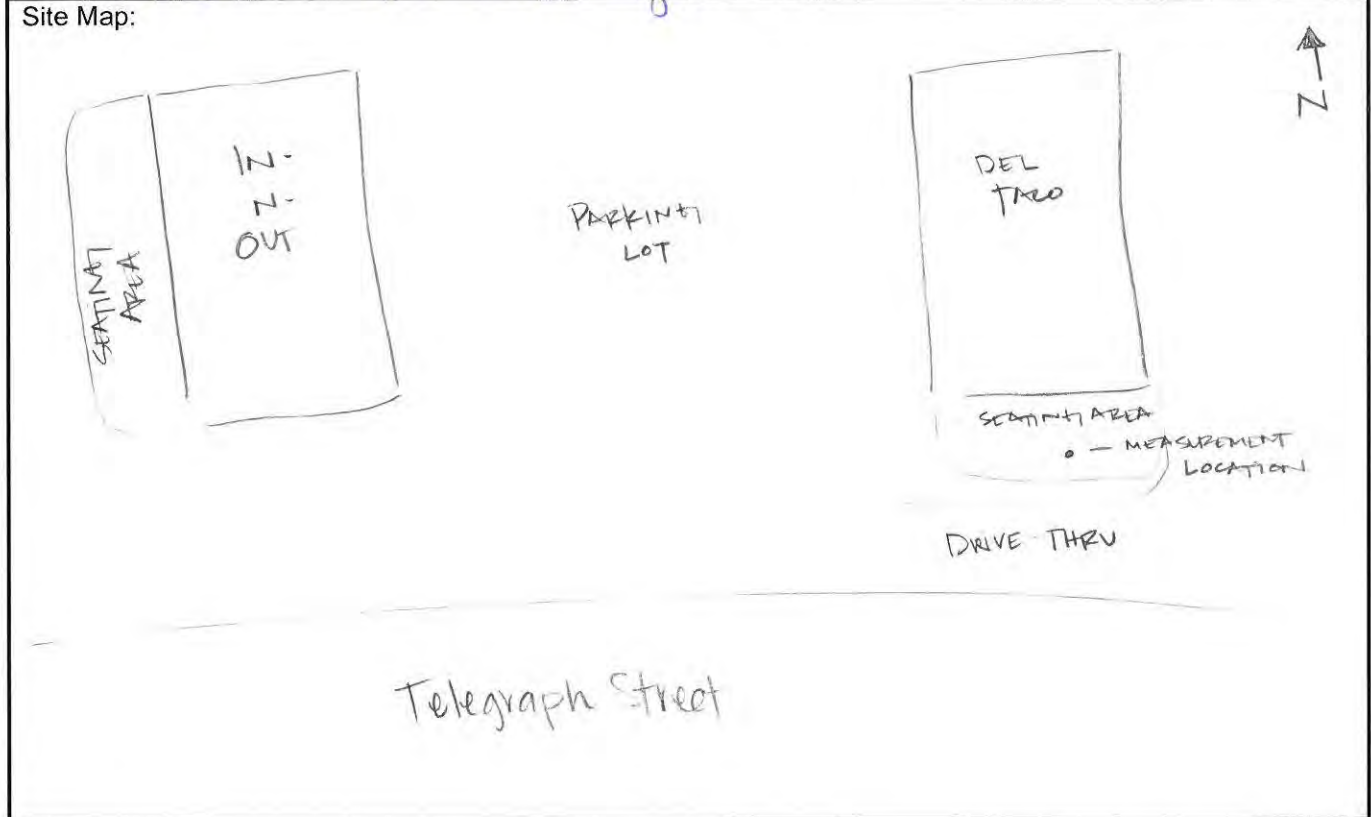
Test No.:	Project Name: <i>MP II Noise</i>	Project No.:	Sheet ___ of
Date: <i>10/15/10</i>	Location: <i>M1</i>	Relative elevation to road:	
Time Started: <i>1:04pm</i>	Weather Conditions:	Site Conditions:	
Time Ended: <i>1:25pm</i>	<i>Sunny, calm 59°F 0.0mph wind 19% humidity</i>		
Calibration			
Pre: <i>94.0 dBA</i>		Date file was downloaded:	
Post: <i>93.7 dBA</i>		File name:	



Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11	
2		12	
3		13	
4		14	
5	<i>1:09pm Motorcycle</i>	15	
6		16	
7		17	
8		18	
9		19	
10		20	




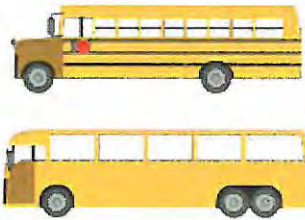

Test No.:	Project Name: MPH NOISE	Project No.:	Sheet ___ of
Date: 10/15/18	Location: M2	Relative elevation to road:	
Time Started: 1:39pm	Weather Conditions:	Site Conditions:	
Time Ended: 2:00pm	Sunny		
Calibration	Breezy 2.2MPH		
Pre: 94.0	59°F	Date file was downloaded:	
Post: 93.5	19% humidity	File name:	



Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

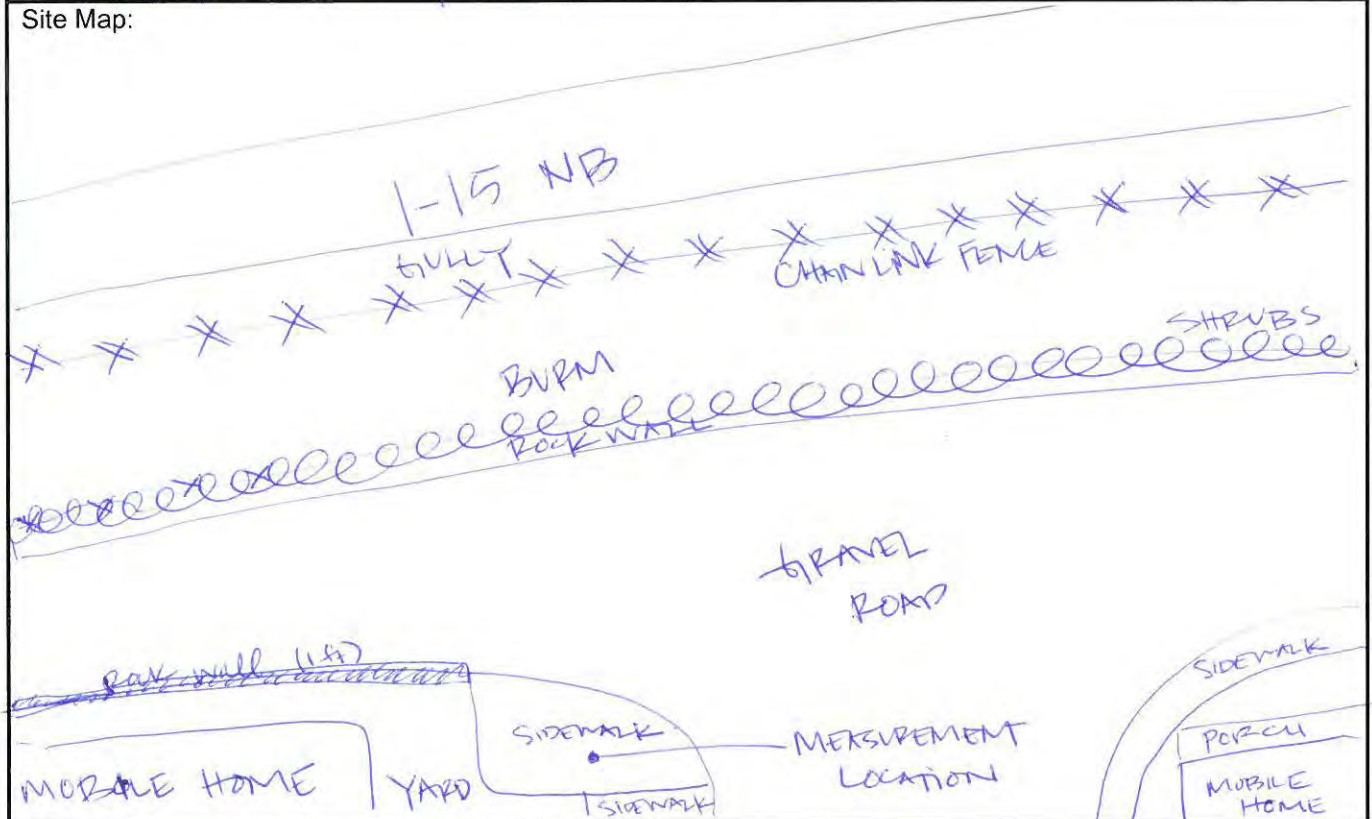
Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11	
2 1:40pm	Car breaks of truck	12	1:50pm Car horn
3 1:41pm	grackie call	13	1:52pm Man talking
4 1:42pm	grackie calls	14	1:57pm truck acceleration
5 1:43pm	Truck ignition	15	1:59pm truck with trailer
6 1:44pm	grackie calls	16	
7 1:44pm	Truck on Telegraph St.	17	
8 1:47pm	car radio	18	
9 1:48pm	truck ignition in drive thru	19	
10 1:49pm	Truck on Telegraph St.	20	

grackie calls through duration of noise reading

Automobiles (includes cargo vans & light trucks)		Medium Trucks (2 axles, 6 tires)		Heavy Trucks (3 or more axles)		Buses (More than 9 passengers)		Motorcycles	
									
<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>
66	5	1111		1111		1			
42	5								
28									
52									
30									
8									
36									
12									
24									
44									
72									
34									
88									

Project: MP 11 EIS Count Location: Del Taco (M2)
Time Started: 1:39 Time Ended: 1:49 Date: 10/15/18

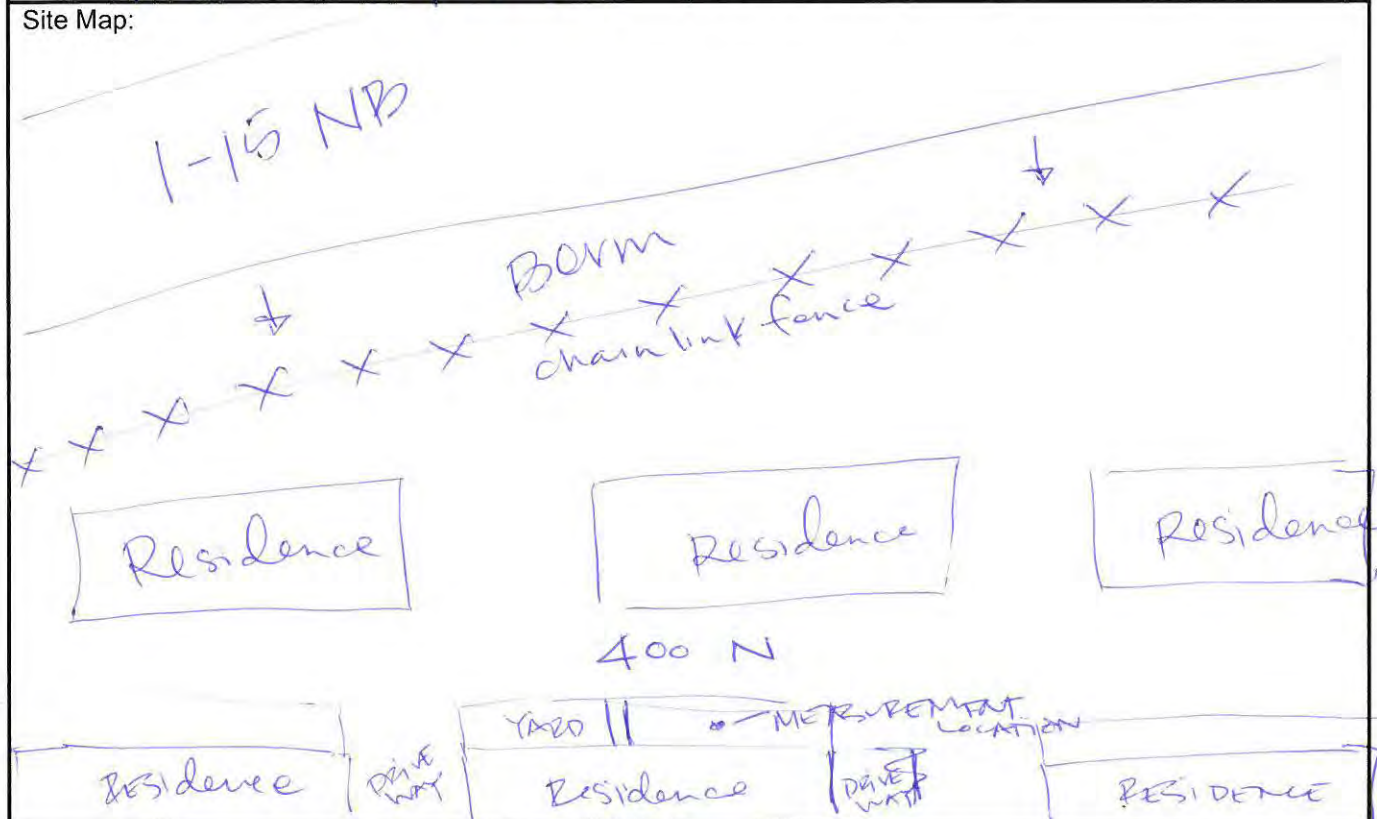
Test No.:	Project Name: <u>MP11 Noise</u>	Project No.:	Sheet __ of
Date: <u>11/2/18</u>	Location: <u>M3 (2)</u>	Relative elevation to road:	
Time Started: <u>4:48pm</u>	Weather Conditions:	Site Conditions:	
Time Ended: <u>5:09pm</u>	<u>Sunny</u>		
Calibration	<u>73°</u>		
Pre: <u>94.0</u>	<u>Humidity 27%</u>	Date file was downloaded:	
Post: <u>94.1</u>	<u>0mph wind</u>	File name:	



Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11	
2 <u>4:50pm</u>	<u>Trucks on I-15 NB</u>	12	
3 <u>4:51pm</u>	<u>Bird chirping</u>	13	
4		14 <u>5:02pm</u>	<u>Motorcycle on I-15 NB</u>
5		15 <u>5:03pm</u>	<u>Ambulance siren I-15 SB</u>
6 <u>4:54pm</u>	<u>Trucks on I-15 NB/SB</u>	16	
7 <u>4:55pm</u>	<u>Motorcycle on I-15 NB</u>	17	
8		18 <u>5:04pm</u>	<u>Trucks on I-15 NB</u>
9		19	
10 <u>4:58pm</u>	<u>Trucks on I-15 NB</u>	20 <u>5:08pm</u>	<u>Motorcycle on I-15 NB</u>

Test No.:	Project Name: MP II Noise	Project No.:	Sheet ___ of
Date: 11/2/18	Location: Mt (2)	Relative elevation to road:	
Time Started: 5:18pm	Weather Conditions:	Site Conditions:	
Time Ended: 5:39pm	Sunny		
Calibration: 3	72°		
Pre: 94.0	Humidity 28%	Date file was downloaded:	
Post: 93.6	0mph winds.	File name:	



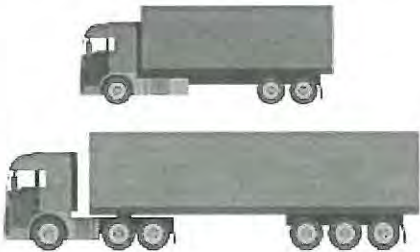
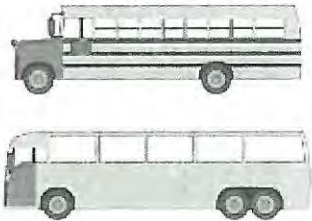






Vehicle Type	Traffic count (vehicles/5 min)				
Automobiles	1	1	1	1	1
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1 5:22	Dirt bikes on 400 N	11	
2		12	
3		13	
4		14	
5 5:23pm	Dirt bikes on 400 N	15	
6		16 5:34pm	Truck on I-15 NB
7		17	
8		18	
9		19 5:37pm	Exhaust pipe rearing I-15 NB
10		20	

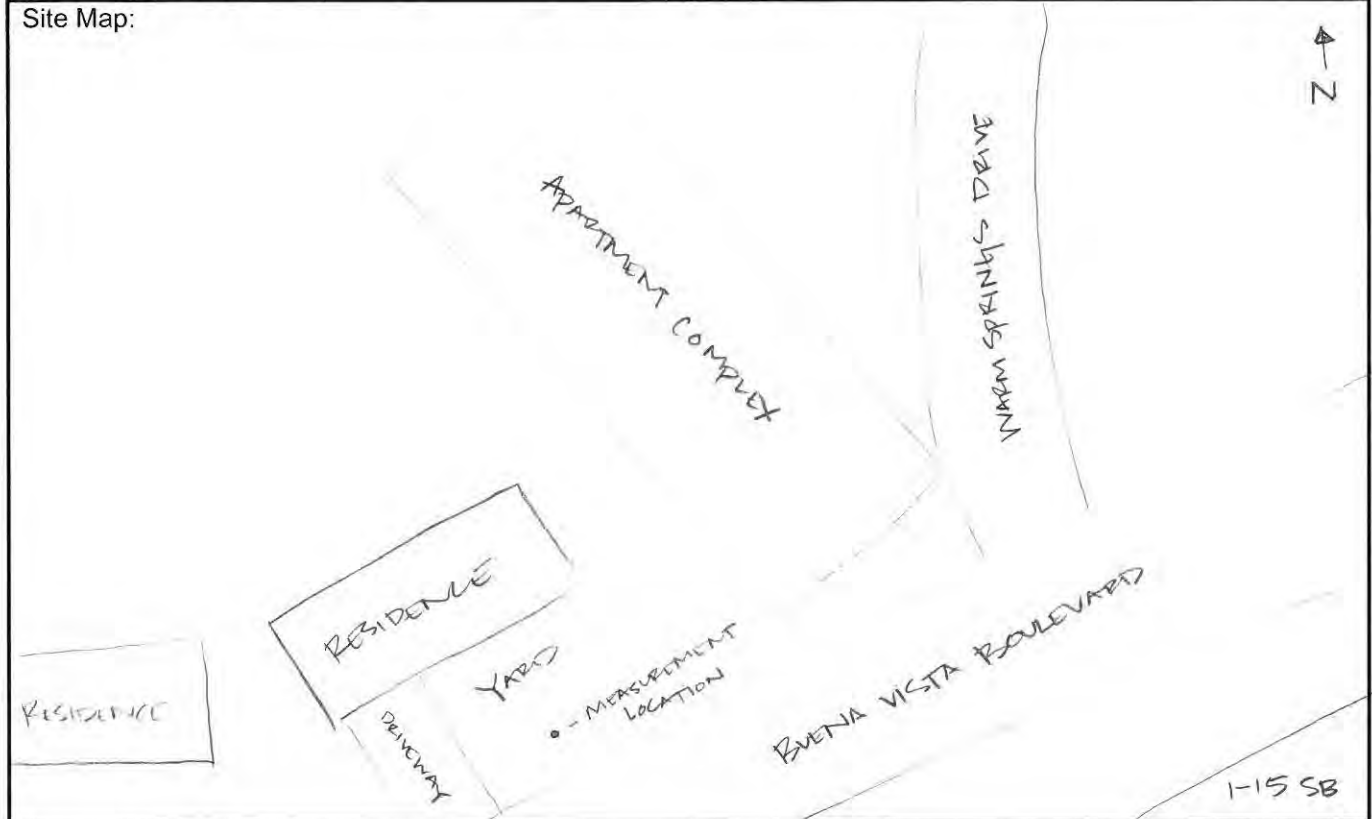
5:20pm -
5:30pm
Dirt bikes on
400 N

MAIN ST.

Automobiles (includes cargo vans & light trucks)		Medium Trucks (2 axles, 6 tires)		Heavy Trucks (3 or more axles)		Buses (More than 9 passengers)		Motorcycles	
									
<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>
									
<p>5:20 5:30 5:30pm</p>								<p>11 total bikes</p>	

Project: MP11 NOISE Count Location: M4 (Main Street) [2nd Reading]
Time Started: 5:20pm Time Ended: 5:30pm Date: 11/2/18

Test No.:	Project Name: <i>MPII Noise</i>	Project No.:	Sheet ___ of
Date: <i>11/16/18</i>	Location: <i>MS</i>	Relative elevation to road:	
Time Started: <i>7:47am</i>	Weather Conditions: <i>Sunny + calm</i> <i>0 mph winds</i> <i>41°F</i> <i>41% humidity</i>	Site Conditions:	
Time Ended: <i>8:08am</i>		Date file was downloaded:	
Calibration		File name:	
Pre: <i>94.0 dBA</i>			
Post: <i>93.0 dBA</i>			






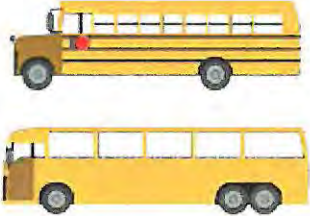

Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11	
2		12	
3		13	
4		14 <i>8:01 am</i>	<i>Heavy truck w/ oversize load Buena Vista Blvd</i>
5		15 <i>8:02 am</i>	<i>Truck on I-15 SB</i>
6		16 <i>8:03 am</i>	<i>Truck w/ trailer on Buena Vista Blvd</i>
7 <i>7:54 am</i>	<i>Trucks on Buena Vista Blvd</i>	17	
8 <i>7:55 am</i>	<i>Truck w/ trailer on Buena Vista Blvd</i>	18 <i>8:05 am</i>	<i>Trucks on I-15 SB</i>
9		19 <i>8:06 am</i>	<i>Heavy truck on Buena Vista Blvd</i>
10		20 <i>8:06 am</i>	<i>Truck with trailer on Buena Vista Blvd</i>

Truck on I-15 SB

Buena Vista Blvd

Buena Vista Blvd

Automobiles (includes cargo vans & light trucks)		Medium Trucks (2 axles, 6 tires)		Heavy Trucks (3 or more axles)		Buses (More than 9 passengers)		Motorcycles	
									
<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>	<u>NB</u>	<u>SB</u>
			1	11					

Project: MP 11 Noise

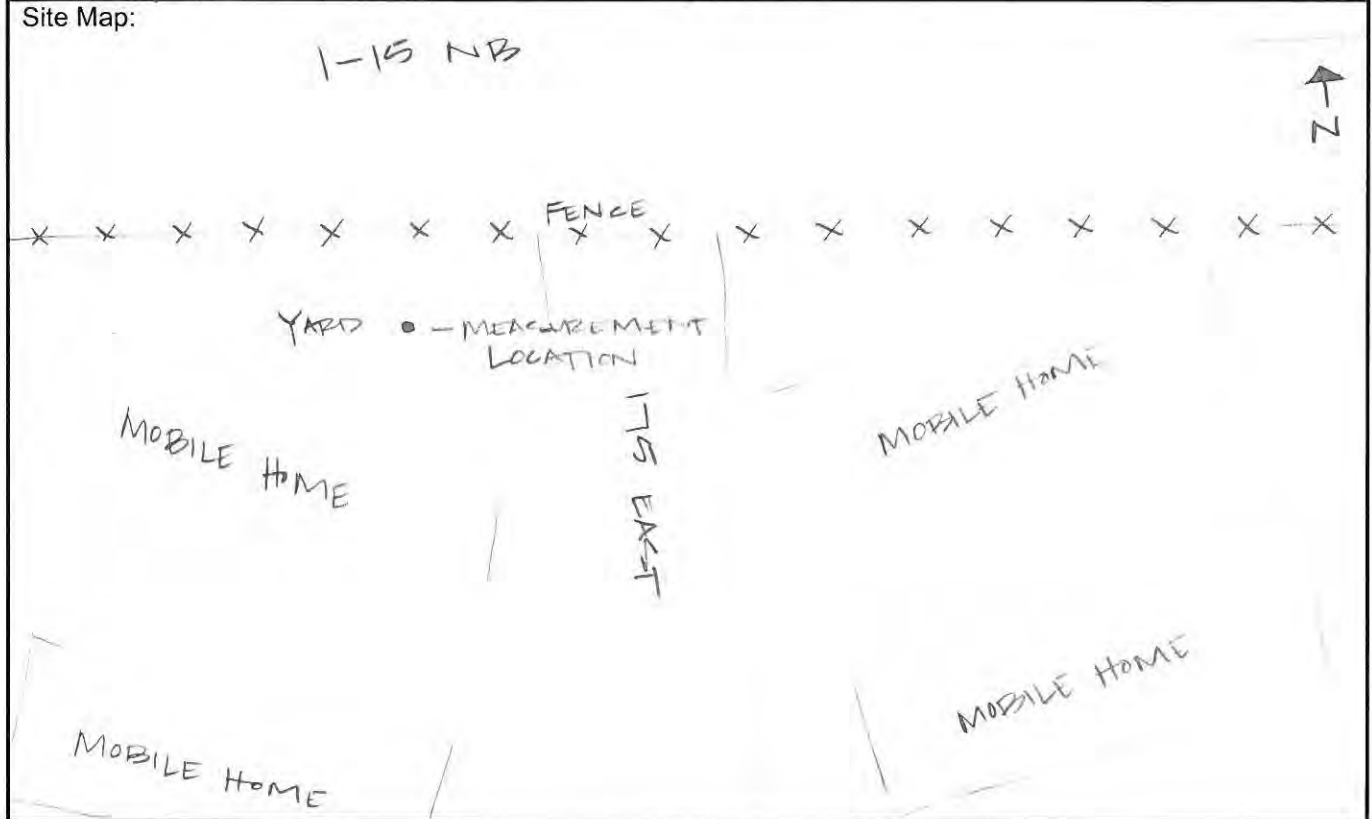
Count Location: M5

Time Started: 7:56 am

Time Ended: 8:06 am

Date: 10/16/18

Test No.:	Project Name: MP11 NOISE	Project No.:	Sheet ___ of
Date: 10/15/18	Location: ML	Relative elevation to road:	
Time Started: 3:21pm	Weather Conditions: Cloudy, calm 62°F 0.6 mph winds	Site Conditions:	
Time Ended: 3:42pm		Date file was downloaded:	
Calibration	15% Humidity	File name:	
Pre: 94.0 dBA			
Post: 94.7 dBA			

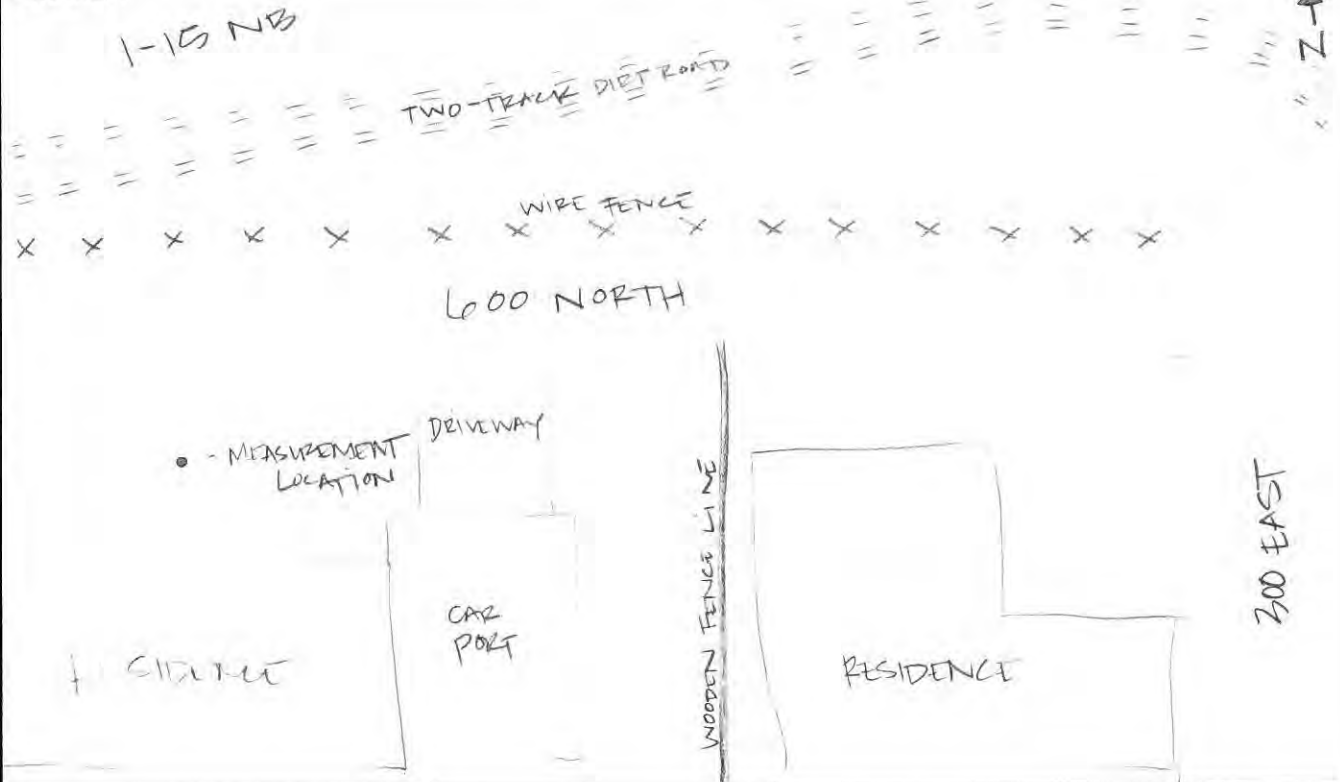


Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1 3:22pm	Trucks on 1-15 NB	11 3:32pm	Truck on 1-15 NB
2 3:23pm	Trucks on 1-15 NB	12	
3 3:24pm	Truck on 1-15 NB	13	
4		14 3:35pm	Truck on 1-15 NB
5 3:26pm	Trucks on 1-15 NB	15	
6 3:27pm	Truck on 1-15 NB	16	
7 3:28pm	Truck on 1-15 NB	17	
8 3:29pm	Motorcycle on trucks on 1-15 NB	18	
9 3:29pm	Truck on 1-15 NB	19 3:40pm	Truck on 1-15 NB
10 3:30pm	Truck on 1-15 NB	20 3:41pm	Trucks on 1-15 NB

Test No.:	Project Name: MP11 Noise	Project No.:	Sheet ___ of
Date: 10/15/18	Location: M7	Relative elevation to road:	
Time Started: 2:52pm	Weather Conditions:	Site Conditions:	
Time Ended: 4:13pm	Sunny & calm		
Calibration	64° F 0.0 mph winds		
Pre: 94.0 dBA	14% humidity	Date file was downloaded:	
Post: 94.2 dBA		File name:	

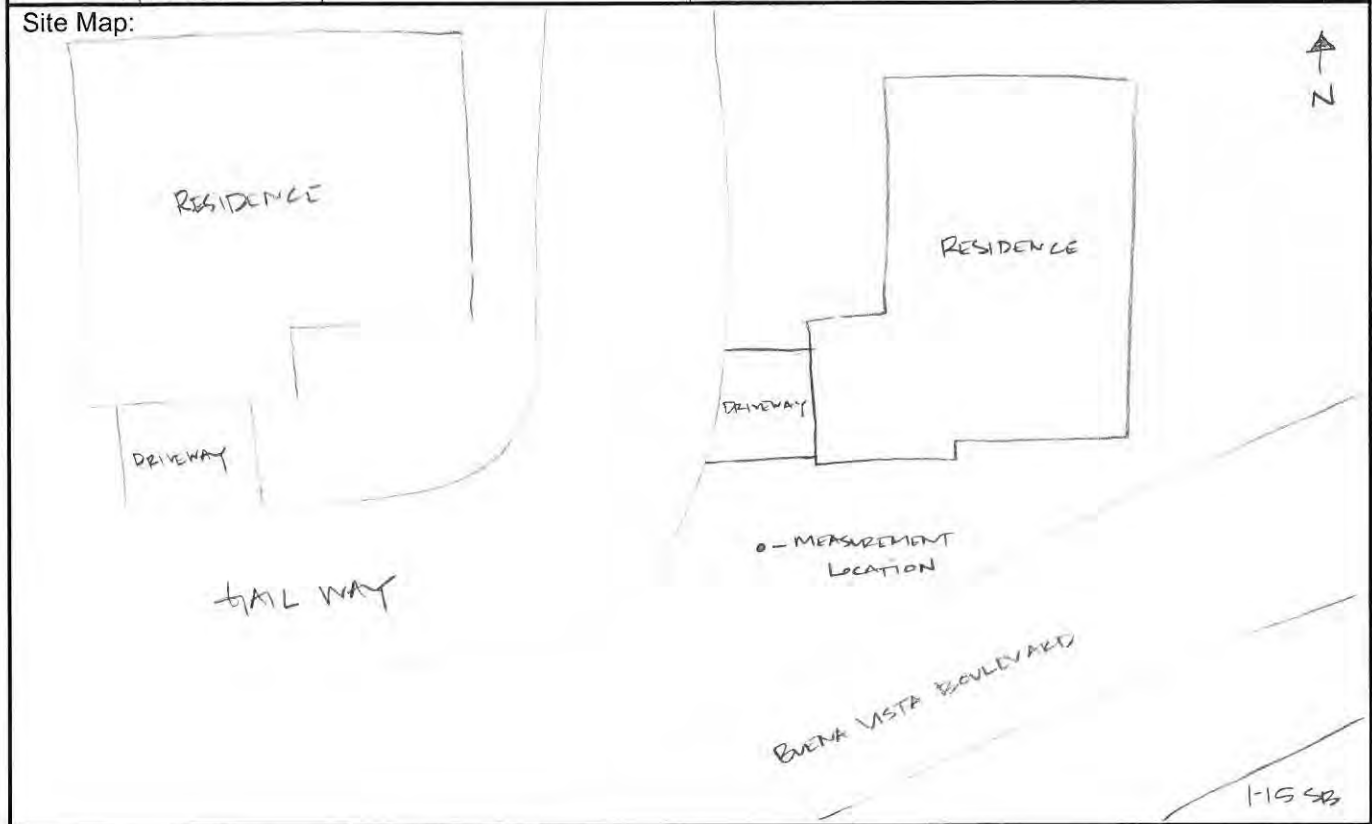
Site Map:



Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11	
2		12	
3		13	
4		14	
5		15	
6		16 4:07pm	Truck on I-15 NB
7		17 4:08pm	Truck on I-15 NB
8		18 4:09pm	Truck on I-15 NB
9		19	
10		20 4:11pm	Truck on I-15 NB




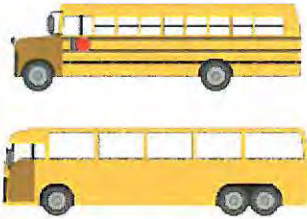

Test No.:	Project Name: <i>MP11 Noise</i>	Project No.:	Sheet ___ of
Date: <i>10/16/18</i>	Location: <i>MB</i>	Relative elevation to road:	
Time Started: <i>8:41am</i>	Weather Conditions: <i>Sunny & calm</i> <i>0.0 mph winds</i> <i>40° F</i> <i>41% humidity</i>	Site Conditions:	
Time Ended: <i>9:02am</i>		Date file was downloaded:	
Calibration		File name:	
Pre: <i>94.0 dBA</i>			
Post: <i>94.1 dBA</i>			



Vehicle Type	BUENA VISTA BOULEVARD		Traffic count (vehicles/ 5 min)			
	MB	SB				
Automobiles	<i> </i>	<i> </i>				
Heavy Trucks		<i> </i>				
Medium Trucks						
Busses/Motorcycles		<i> </i>				

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11 8:52am	Truck on I-15 SB
2		12 8:53am	Motorcycle on I-15 SB
3 <i>8:44am</i>	<i>Trucks on I-15 SB</i>	13 8:54am	School bus on Buena Vista Blvd
4		14	
5		15 8:56am	Truck on I-15 SB
6		16 8:57am	Truck on I-15 SB
7		17	
8		18	
9		19	
10		20 9:01am	Police siren on I-15 SB & truck on Buena Vista Blvd.

8:45am-8:55am

Automobiles (includes cargo vans & light trucks)		Medium Trucks (2 axles, 6 tires)		Heavy Trucks (3 or more axles)		Buses (More than 9 passengers)		Motorcycles	
									
NB	SB	NB	SB	NB	SB	NB	SB	NB	SB
# 1	# # # # #				1		1		

Project: MP11 EIS

Count Location: MB

Time Started: 8:45 am

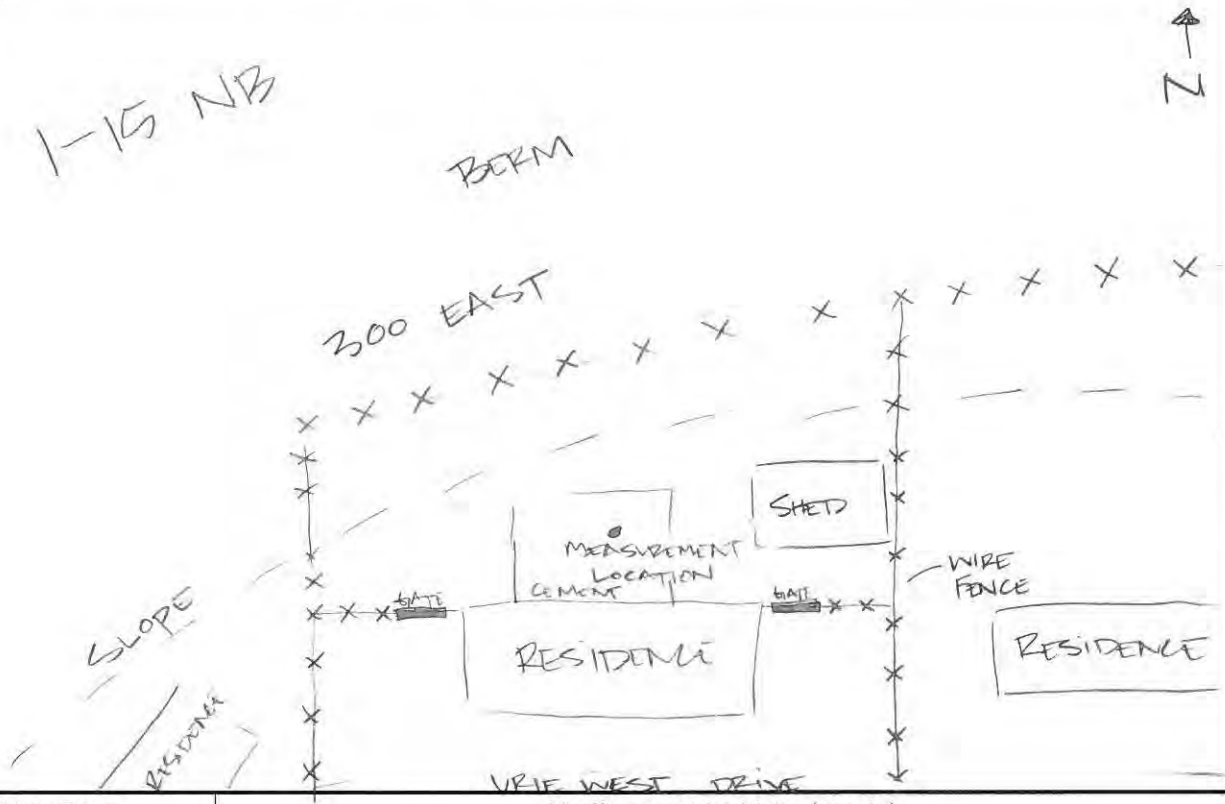
Time Ended: 8:55 am

Date: 10/16/18

Street counted: Buenos Vista Boulevard

Test No.:	Project Name: MP II NOISE	Project No.:	Sheet ___ of
Date: 10/15/18	Location: M9	Relative elevation to road:	
Time Started: 4:21pm	Weather Conditions: Sunny & calm 0.0 mph winds 64° F 14% humidity	Site Conditions:	
Time Ended: 4:42pm		Date file was downloaded:	
Calibration		File name:	
Pre: 94.0 dBA			
Post: 93.8 dBA			

Site Map:



Vehicle Type	Traffic count (vehicles/ 5 min)				
Automobiles					
Heavy Trucks					
Medium Trucks					
Busses/Motorcycles					

Elapsed Time (min)	Comments	Elapsed Time (min)	Comments
1		11	
2 4:23pm	Truck on I-15 NB	12 4:27pm	Truck on I-15 NB
3		13 4:31pm	Truck on I-15 NB
4		14	
5		15	
6		16	
7		17	
8		18 4:37pm	Truck on I-15 NB & dog bark
9 4:38pm	Truck on I-15 NB	19	
10 4:39pm	Truck drove over rumble strip on I-15 NB	20	



Figure A-1 Measurement Location 1. Quality Inn; 910 West Red Cliffs Drive, Washington, Utah.



Figure A-2 Measurement Location 2. Del Taco Restaurant; 832 West Telegraph Street, Washington, Utah.



Figure A-3 Measurement Location 3. Residence; 380 North Barbara Drive, Washington, Utah.



Figure A-4 Measurement Location 4. Residence; 381 North Main Street, Washington, Utah.



Figure A-5 Measurement Location 5. Residence; 135 East Buena Vista Boulevard, Washington, Utah.



Figure A-6 Measurement Location 6. Residence; 501 North 200 East, Washington, Utah.



Figure A-7 Measurement Location 7. Residence; 605 North 300 East, Washington, Utah.



Figure A-8 Measurement Location 8. Residence; 788 North Gail Way, Washington, Utah.



Figure A-9 Measurement Location 9. Residence; 343 East Urie North Drive, Washington, Utah.