Arizona Department of Transportation

Environmental Planning Group

Noise Analysis Technical Report

SR 303L, SR 30 to I-10

Federal Project No.: STP-303-A(ASO)T
ADOT Project No.: 303L MA 100 H6870 01L

Submittal Date
March 6, 2018

Submittal Number (2)

Remarks:

Noise Abatement eligibility must be readdressed for the properties in relation to the Date of Public Knowledge and Public Involvement process, and evaluated at Final Design stage based on the selected Alternative, as Preliminary Concept is subject to change.

DocuSigned by:
Ivan Racic 3/8/2018
D00D4A7BCC34420...

Noise Analysis Technical Report
FOR
SR 303L, SR 30 to I-10

Federal Project No.: STP-303-A(ASO)T
ADOT Project No.: 303L MA 100 H6870 01L

Prepared for:
Arizona Department of Transportation
Environmental Planning Group
1611 West Jackson Street, EM02
Phoenix, Arizona 85007

Prepared by:
Newton Environmental Consulting, LLC
9393 E. Palo Brea Bend, Suite 2074
Scottsdale, AZ 85255

March 6, 2018

TABLE OF CONTENTS

LIST OF TABLES

LIST OF TABLES (CONTINUED)

LIST OF FIGURES

APPENDICES

1.0 EXECUTIVE SUMMARY

The purpose of this noise analysis technical report is to document the existing and future traffic conditions on SR303L between Interstate 10 (I-10) and the Gila River to the south within City of Goodyear. The project location and limits are shown in Figure 1-1. This Traffic Noise Report supplements the Environmental Assessment (EA) being prepared for this proposed roadway project to build an ultimate ten lane access-controlled freeway from I-10 to future SR30. This project is located in the Arizona Department of Transportation's ADOT Central District within Maricopa County. The Arizona Department of Transportation (ADOT) has updated the Noise Abatement Requirements (NAR) in May 2017. This noise analysis adheres to the May 2017 ADOT NAR and focuses on the Existing, No-Build, and Build Conditions. **Table 1** shows the summary of this noise analysis.

TABLE 1
SUMMARY OF NOISE ANALYSIS
SR 303L, SR 30 TO I-10

Parameters	Existing 2018	No-Build 2040	Build Alternative		
			2C	3	5
No. of Modeled Receivers	129	123	229	213	243
No. of Representative Receptors	516	671	777	761	790
Range of Noise Levels, dBA	41 to 60	53 to 71	56 to 78	51 to 68	49 to 68
No. of Barriers Needed for Mitigation	N/A	N/A	8	8	9
Cost of Mitigation[1]	N/A	N/A	$7,865,715	$7,792,715	$8,127,500

1. Mitigation cost is based on $35/ft^2 and $85/ft^2 on-structure barrier

2.0 PROJECT INTRODUCTION

The SR 303L, SR 30 to I-10 project is located in the ADOT Phoenix Construction District within Maricopa County. This project is included in the January 2014 Regional Transportation Plan Freeway Program (RTPFP), which was approved by the voters of Maricopa County through the passage of Proposition 400 in November 2004.

The SR 303L freeway is a major transportation corridor of the Maricopa Association of Governments (MAG) Regional Freeway System. The planned freeway is a forty-mile long new freeway extending from the future SR30 (I-10 Reliever) north to I-10, across US60/Grand Avenue, then to the northeast to connect to Interstate 17 (I-17).

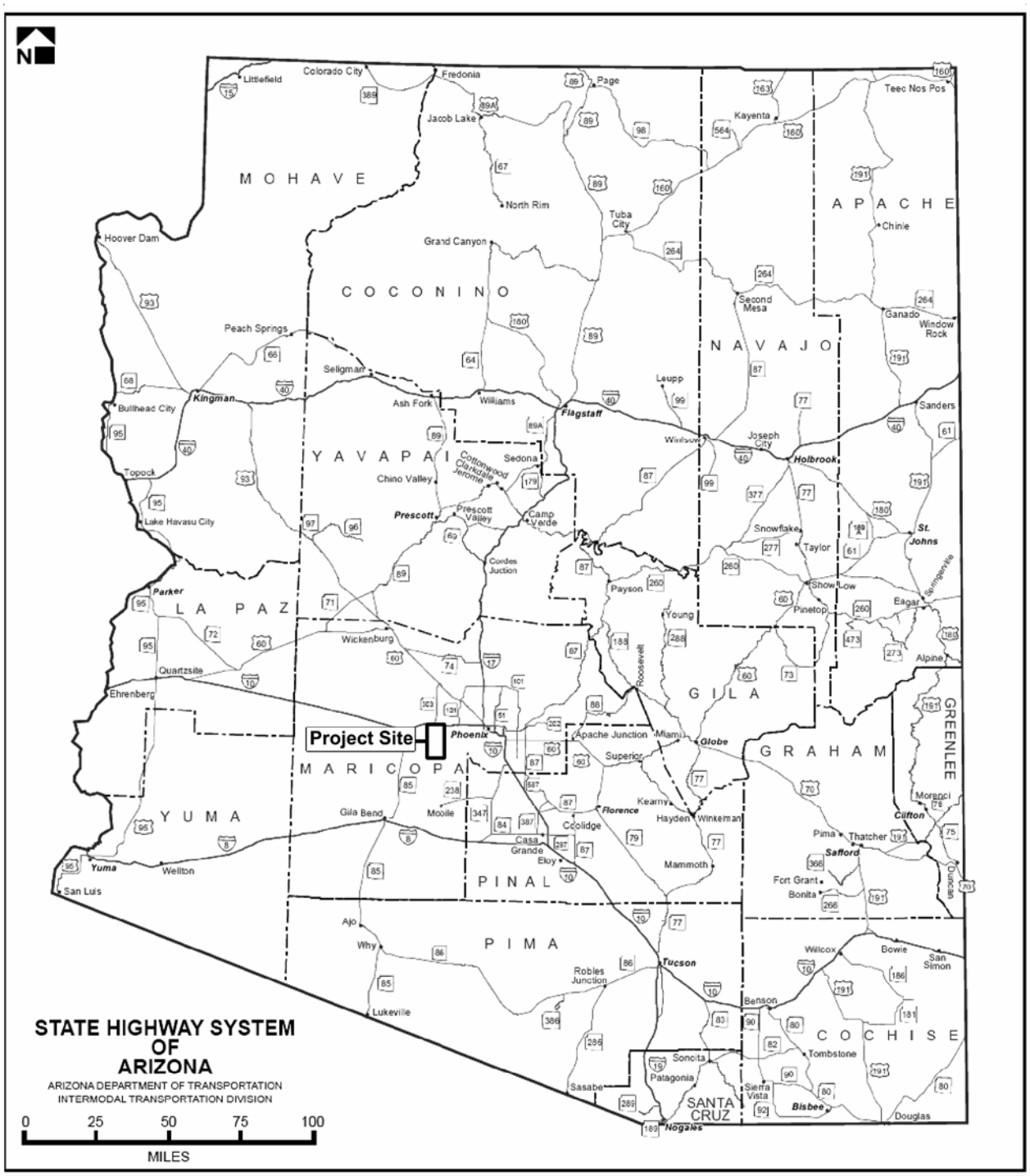
According to the Traffic Report (September 2017) for this project, this proposed freeway is needed to:

- *Accommodate the projected local and regional traffic demand in and through the study area,*
- *Provide a freeway facility that is a vital link between I-10 and future SR 30 to serve through traffic and traffic entering and leaving the greater Phoenix Metropolitan Area,*
- *Provide a regional route to serve the rapidly developing area south of the I-10 freeway that is planned for development as adopted by the City of Goodyear Plan.*
- *Minimize anticipated congestion levels, thereby reducing motorists' travel time and highway user costs.*
- *Conform to approved local and regional development and transportation plans.*

Traffic noise is a major component in freeway planning. The implementation of the SR 303L from SR 30 to I-10 has the potential for noise impacts at noise sensitive receptors located along the project limits. The purpose of this noise analysis technical report is to identify traffic noise impacts and to provide mitigation per the ADOT Noise Abatement Requirements (NAR) for three Build Condition Alternatives (2C, 3, and 5, with SR 30 aligned to the south), as well as the No-Build and Existing Conditions. The Design Year for this project is 2040.

Figure 1 on page 3 shows the project location. Figures 2, 3, and 4 on pages 4, 5, and 6, respectively, show the Build Condition for Alternatives 2C, 3, and 5.

FIGURE 1. PROJECT LOCATION



SR 303L, SR 30 to I-10
STP-303-A(AS0)T
303 MA 100 H6870 01L
FIGURE 1

FIGURE 2. PROJECT LOCATION, SR 303L ALTERNATIVE 2C

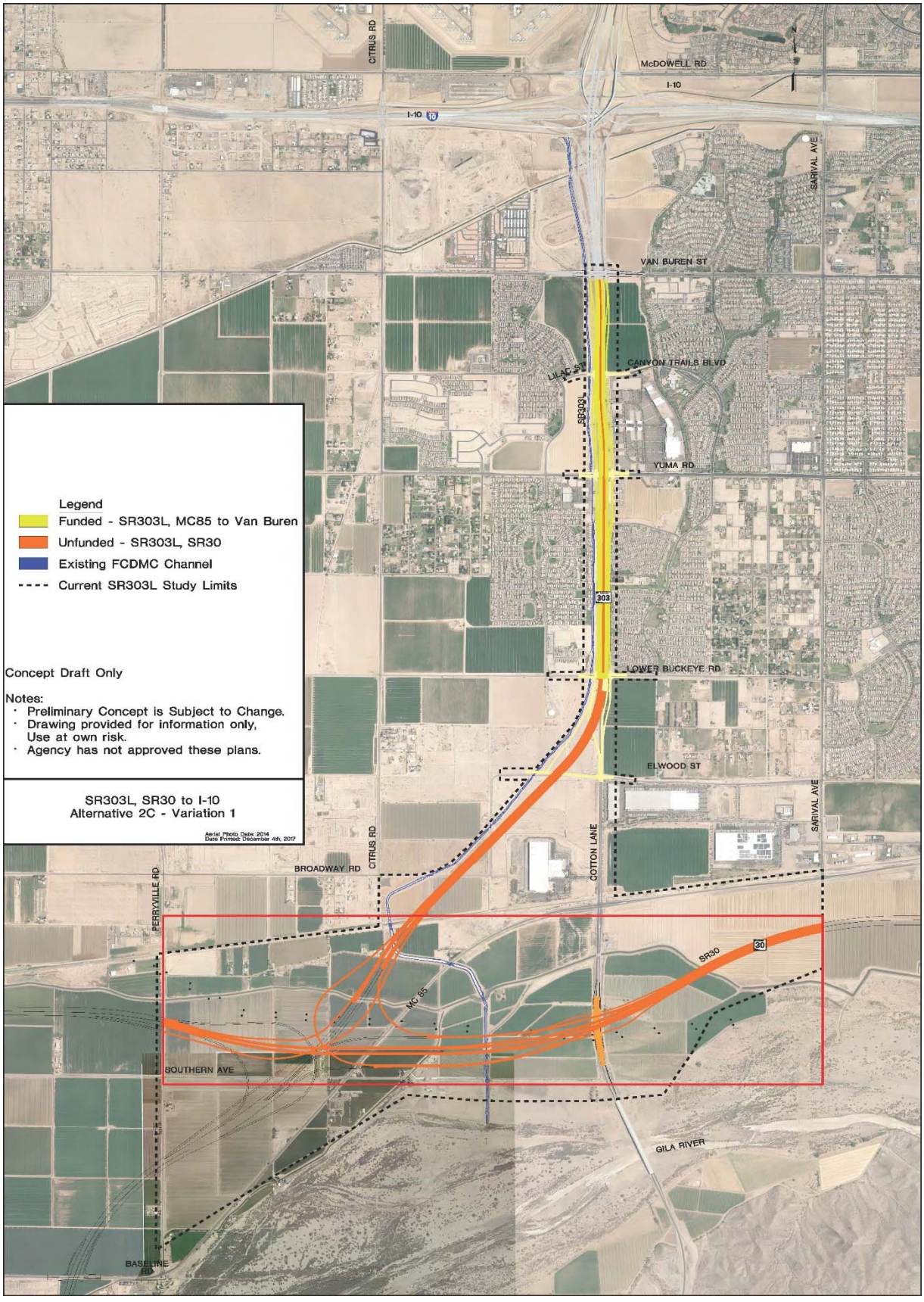


FIGURE 3. PROJECT LOCATION, SR 303L ALTERNATIVE 3

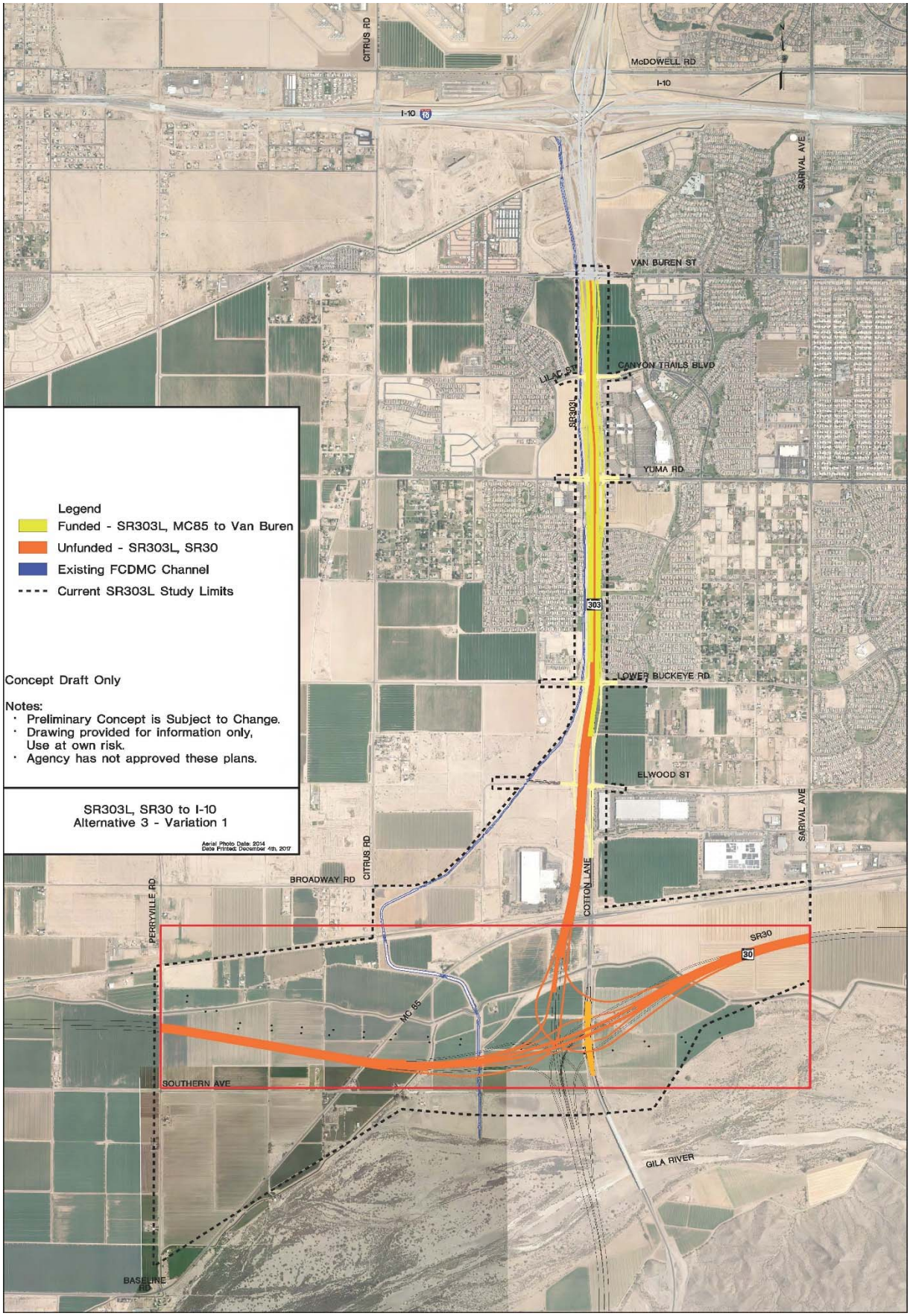
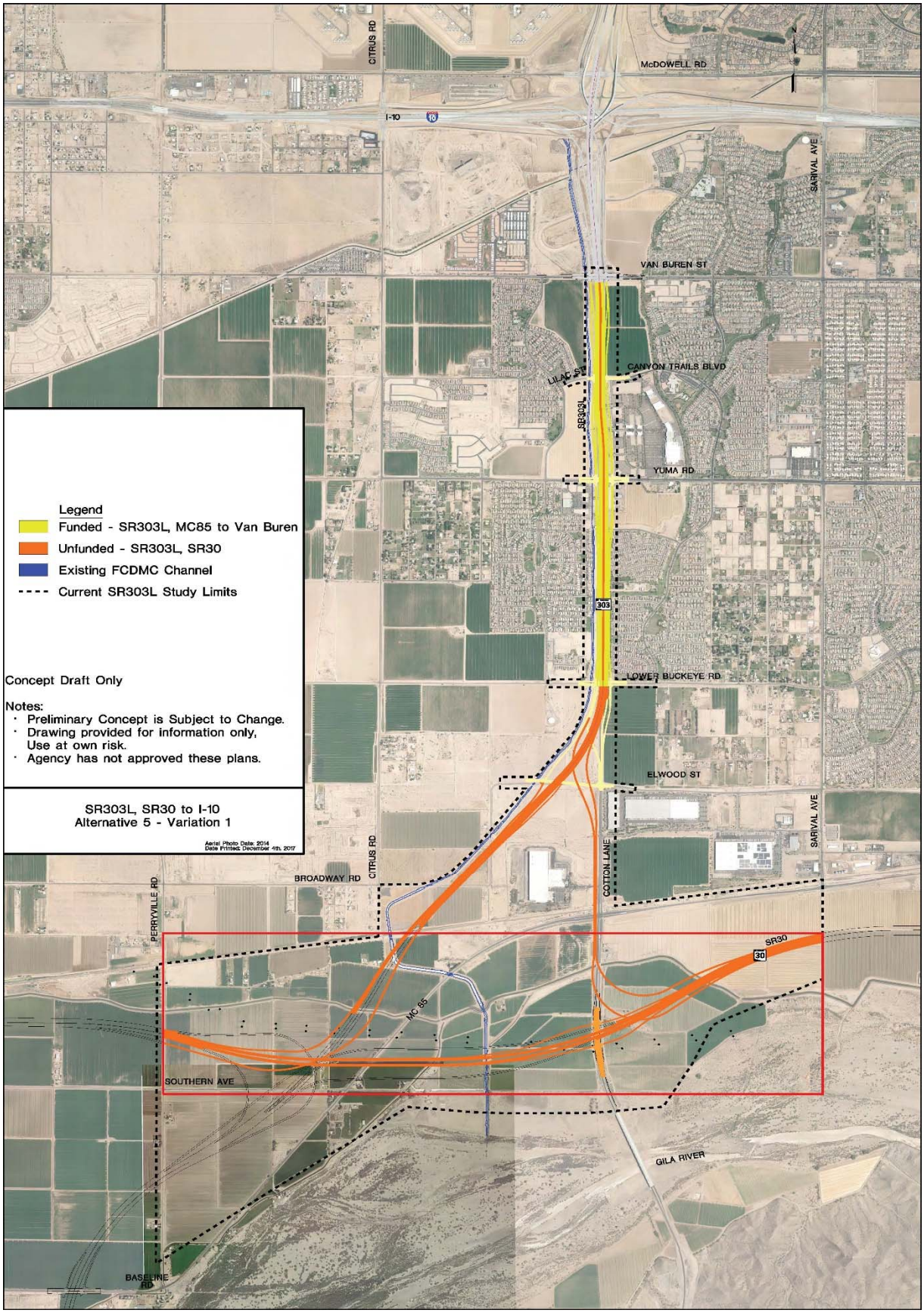


FIGURE 4. PROJECT LOCATION, SR 303L ALTERNATIVE 5



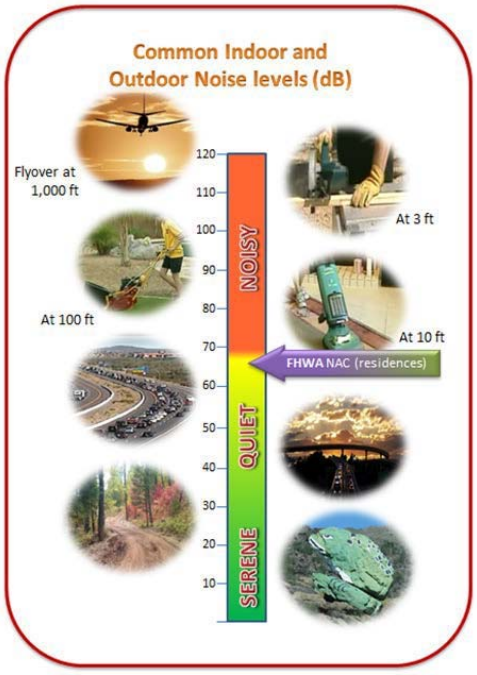
3.0 NOISE STUDY PROCEDURES

This noise study procedure, as specified by 23 C.F.R. § 772, follows a six-step process:

1. Identify noise-sensitive land uses,
2. Determine existing noise levels,
3. Predict future (Design Year) noise levels,
4. Determine traffic noise impacts at the noise-sensitive receptors by comparing future (Design Year) noise levels of the Proposed Alternatives with the existing noise levels,
5. Identify any noise impacts resulting from project construction activities, and
6. Provide and evaluate information from local land use planning agencies regarding predicted future (Design Year) noise levels for use in land development decisions.

4.0 FUNDAMENTALS OF TRAFFIC NOISE

Sound is the sensation produced by stimulation of the hearing organs produced by continuous and regular vibrations of a longitudinal pressure wave that travels through an elastic medium (air, water, metal, wood) and can be heard when they reach a person's or animal's ear. When sound travels through air, the atmospheric pressure wave variations occur periodically. It travels in air at a speed of approximately 1087 feet per second at sea level and temperature of 32 °F. Noise is usually defined as any "unwanted sound," and consists of sounds that are perceived as interfering with communication, work, rest, and recreation. It is characterized as a non-harmonious or discordant group of sounds.



Sound Pressure Levels, Decibels, Frequencies and A-Weighted Decibels-dB(A)

Noise can be measured in Pa (Pascal). A healthy human ear can detect a pressure variation of 20 µPa and it is referred to as threshold of hearing. Logarithmic scale is useful for handling numbers on a wide scale, but for a smaller span, the decibel or (dB) scale is used. Sound pressure level (SPL) is calculated is using measured sound level and the hearing threshold of 20 µPa or 20 x 10^{-6} Pa as the reference level, this level can also be defined as 0 dB. The decibel alone is insufficient to describe how human ear responds to sound pressures at all frequencies. The human ear has peak response in the range of 2,500 to 3,000 Hz and has a somewhat low response at low or even high frequencies. In response to the human ear sensitivity, the A-weighted noise level, referenced in units of dBA, was determined to better resemble people's perception of sound levels. This dBA unit of measurement is used in noise studies and reporting. Changes in sound level under 3 dBA are not noticed by human ear, while the human ear perceives a 10 dBA increase in sound level to be a doubling of sound.

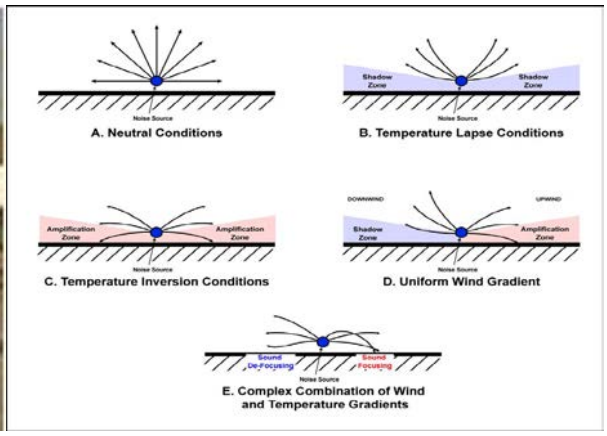
Noise Descriptors

The most commonly used noise descriptor in traffic noise analysis is Equivalent Sound Level (L_{eq}). L_{eq} represents an average of the sound energy occurring over a specified period. In effect, L_{eq} is the steady-state sound level containing the same acoustical energy as the time-varying sound that actually occurs during the same period. The 1-hour A-weighted equivalent sound level [$L_{Aeq(h)}$] is the energy average of A-weighted sound levels occurring during a one-hour period, and is the basis for noise criteria used by ADOT.

What are source, receiver, receptor, and path when talking about traffic noise?

Traffic noise is a combination of the noises produced by vehicle engines, exhaust, and tires. The source of highway traffic comes from vehicles traveling on highways. The noise level at the *Source* depends on pavement type, number of heavy trucks, traffic volumes, and traffic speeds. The predominant noise sources in vehicles at speeds less than 30 mph are engine and exhaust. At speeds greater than 30 mph, tire noise becomes the dominant noise source.

In the illustration below, the Receptor is any location where people are affected by the traffic noise. It can be residence, park, school, playground and any other place where frequent human use occurs. An area between the source and the receptor *(receiver* represents a receptor(s) when modeled in FHWA Traffic Noise Model) is considered a path. Depending on the path surface, propagation of sound may be reduced; such is the case for the soft ground and fresh snow. Doubling the distance between the source and receptor reduces noise by three dBA depending on the ground.



Air changes its density due to variation of humidity and temperature, and wind influences refraction of sound waves. Wind, humidity, and temperature may have a significant impact, but only influences the receptors located a long distance away from source. As residents are usually much closer to the noise source, any atmospheric conditions are insignificant for consideration.

For more information on noise, please visit ADOT Environmental Planning Noise webpage.

5.0 NOISE IMPACT CRITERIA

The ADOT NAR provides the guidelines used to assess the potential negative impacts from highway traffic noise levels and determines the need for noise abatement. The noise level impact methodology used for this analysis is based on the current ADOT NAR. The Federal Highway Administration (FHWA) has established Noise Abatement Criteria (NAC) and procedures to be used in the planning and design of highways. A summary of the NAC for various land uses is presented in **Table 2**.

The ADOT *NAR* is based on the noise levels approaching the FHWA NAC. ADOT defines "approaching" as within 1 dBA of the FHWA NAC for Activity Categories A, B, C, D, and E. There are no noise impact thresholds for Activity Category F or G. The ADOT NAR determines highway traffic noise level impacts and considers mitigation for residential land uses when the predicted noise level is equal to or greater than the noise impact threshold of 66 dBA. ADOT also indicated that noise levels should be rounded to the nearest integer prior to impact determination and in project reports.

TABLE 2
FHWA NOISE ABATEMENT CRITERIA[1]

Activity Category	dBA, L_{Aeq1h}[2]	Activity Description
A	57 (exterior)	Land on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	Residential.
C	67 (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 (interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio structures, recording studios, schools, and television studios.
E	72 (exterior)	Hotels, motels, offices, restaurants/bars, and other developed 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.

1. Sources: Federal Highway Administration (2011); 23 Code of Federal Regulations § 772.
2. The 1-hour equivalent loudness in A-weighted decibels, which is the logarithmic average of noise over a 1-hour period.

6.0 NOISE SENSITIVE LAND USES

The land uses within the project limits include residential, commercial, and agricultural. This noise analysis focuses on representative noise sensitive receptors in the FHWA NAC Categories B, C, D, and E located throughout the project corridor. There are several newly proposed residential developments that are actively pursuing building permits. The first development, *Christopher Todd Communities at Canyon Trails*, is located on the southwest corner of Van Buren Road and Cotton Lane. The second development, *Crestwood at Canyon Trails*, is located approximately one half-mile south of Van Buren Road and adjacent to the west side of Cotton Lane. The third proposed development, *El Cidro* (Phase 1, Parcel 3), is located on the southwest corner of Lower Buckeye Road and Cotton Lane.

7.0 EXISTING NOISE ENVIRONMENT

Short-term noise level monitoring was conducted within the project limits on October 11, 2017 to describe the existing noise environment. Five measurement locations were chosen to represent noise sensitive receptors in residential communities along the project corridor.

Three 15-minute interval equivalent noise level measurements (L_{eq}) were conducted at each site. Noise level monitoring helps describe the existing noise environment throughout the project area and capture the contribution of traffic noise from surrounding roadways. Measured noise levels may include contributions from other noise sources, including but not limited to, airplanes from nearby Luke Air Force Base, wind, birds, insects, landscaping equipment, etc.

The equipment used for the noise level monitoring was a Larson Davis Model LXT Class 1 integrating sound level meter (SLM). The SLM was calibrated in the field before each measurement using a Larson Davis Model CAL200. Existing noise measurements were collected under meteorologically acceptable conditions when the pavement was dry and winds were calm or light. Additional data collected at each monitoring location included atmospheric conditions such as general wind speed and direction, humidity, dewpoint, barometric pressure, and ambient temperature. Measurements were collected based on the acceptable collection of existing noise level readings per FHWA Report number FHWA-PD-96-046, and “Measurement of Highway Related Noise.”

The measured noise level ranged from 46 dBA to 68 dBA. **Appendix A** shows the location of the noise level monitoring sites, and **Table 3** shows the summary of the noise level measurements. **Appendix B** shows the measured noise level data.

TABLE 3
SUMMARY OF NOISE LEVEL MONITORING

Measurement Locations	15-Minute Interval Measured Noise Levels (L_{eq}), dBA		
	Interval 1	Interval 2	Interval 3
Mon 1	53.8	50.6	50.3
Mon 2	57.0	57.5	56.9
Mon 3	68.0	50.2	67.2
Mon 4	45.9	47.0	46.3
Mon 5	50.1	48.4	48.2

8.0 NOISE MODELING METHODOLOGY AND TNM 2.5 VARIABLES

The FHWA-approved Traffic Noise Model version 2.5 (TNM 2.5) is the computer noise model used for the prediction of highway and roadway traffic noise levels. The output of the model is dependent upon variables, which include atmospheric conditions, roadway geometries, topographic data, ground types, noise receiver locations, traffic volumes, vehicle speed, and vehicle mix.

Atmospheric Conditions

Noise level is affected by temperature and humidity. Temperature gradients cause refraction effects. For example, in the morning, when the ground is still cool from the night before but the upper air is warming due to the sun, noise can bounce between the gradient and the ground, forming regions of higher and lower noise intensity. Noise attenuation is also affected by humidity. Dry air absorbs more acoustical energy than moist air because dry air has a higher density than moist air at a given temperature. For noise modeling purposes, FHWA recommends the default values of 68 degrees Fahrenheit for the temperature and 50 percent humidity.

Roadway Geometry & Topographic Data and Ground Type

The Roadway geometries and topographic data for the project were based on design plans provided by the design engineer (WSP). Hard soil was used to approximate the ground type between the roadway and receptors.

Receptor and Receiver Locations

The ADOT NAR defines a “receptor” as a discrete or representative location of a noise sensitive area(s) for any of the land uses listed in **Table 2** on page 8. A “Receiver” is defined as a location used in noise modeling to represent the measured and predicted noise level at a particular point. The noise-sensitive receptors are located in the backyard or common outdoor areas of residential locations.

Traffic Volumes

The ADOT NAR provides guidelines on the traffic volumes for use in the noise model, in which a “worst-case” approach should be used. In general, this should reflect Level of Service (LOS) C traffic conditions during the peak hour, with traffic moving at 5 miles per hour (mph) above the posted speed limit. Also, if the future traffic volumes are less than the maximum LOS C volumes, then the future traffic volumes will be utilized. If no other traffic information is available, the peak hourly volume should be 10 percent of the annual average daily traffic (AADT) volume. For this analysis, the Existing, No-Build, and Build Conditions are based peak-hour volumes. These volumes are shown in **Appendix C**.

Vehicle Speed

The current posted speed limit for Cotton Lane is 45 mph. The modeled vehicle speeds are 50 mph for the Existing and No-Build Conditions. For the Build Condition, the

freeway mainline modeled vehicle speed is 70 mph, service ramps and directional ramps at 50 mph. The modeled vehicle speeds are 5 mph greater than the posted speed limits.

Vehicle Mix

The percentages of vehicles by type (vehicle mix) is an important input for the noise model, because different vehicle types exhibit different base or reference noise emission levels, such as with trucks that produce higher reference levels than cars, and larger trucks that produce higher reference levels than smaller trucks. Vehicle types are defined as follows:

- Cars (Auto): All vehicles with two axles and four wheels designed primarily for passenger transportation or cargo (light trucks). Generally, the gross vehicle weight is less than 10,000 pounds.
- Medium Trucks: All vehicles having two axles and six wheels designed for the transportation of cargo. Generally, the gross vehicle weight is greater than 10,000 pounds but less than 26,400 pounds.
- Heavy Trucks: All vehicles having three or more axles and designed for the transportation of cargo. Generally, the gross weight is greater than 26,400 pounds.

This noise analysis focuses on automobile, medium truck, and heavy truck usage on the roadways. The vehicle mix used in this analysis is shown in **Appendix C**.

9.0 FUTURE NOISE ENVIRONMENT AND IMPACT DETERMINATION

The proposed SR 303L alignment is along Cotton Lane. Currently, Cotton Lane is a four-lane arterial roadway from Van Buren Street to Yuma Road, a two-lane roadway from Yuma Road to MC85, and a four-lane divided roadway from MC85 across the Gila River. The No-Build Condition is based on the existing configuration of Cotton Lane and improvements to the I-10/SR 303L system traffic interchange (TI).

This noise analysis addresses three Build Condition Alternatives. Alternatives 2C, 3, and 5 design concepts are similar for the freeway segment north of Lower Buckeye Road. South of Lower Buckeye Road, Alternative 2C aligns SR 303L in a southwestern direction to the proposed SR 30 TI; Alternative 3 continues SR 303L along Cotton Lane to the proposed SR 30 TI; and Alternative 5 is similar to Alternative 2C with the inclusion of a connection along Cotton Lane. The Alternatives are shown in Figures 2, 3, and 4 on pages 4, 5, and 6, respectively. The location of the modeled receivers are shown in **Appendix A**.

Van Buren Street to Yuma Road - West

A total of 30 receivers were modeled to represent 228 noise-sensitive receptors west of Cotton Lane between Van Buren Street and Yuma Road. **Table 4** shows the No-Build and Build Alternative modeled noise levels for the receivers.

TABLE 4
MODELED NOISE LEVEL RESULTS
Van Buren Street to Yuma Road - West

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R2_1W-01_NI	60	55	55	55
R2_1W-02_NI	60	59	59	60
R2_1W-03_NI	57	56	56	56
R2_1W-04_NI	54	57	57	58
R2_1W-05_NI	55	58	58	59
R2_1W-06_NI	55	58	58	59
R2_1W-07_NI	56	59	59	60
R2_1W-08_NI	57	61	61	61
R2_1W-09_NI	56	60	61	61
R2_1W-10_NI	55	58	59	59
R2_1W-11_NI	55	59	59	60
R2_1W-12_NI	55	58	59	59
R2_1W-13_NI	56	59	60	60
R2_1W-14_NI	56	58	59	59
R2_1W-15_NI	56	60	60	61
R2_1W-16_NI	54	56	56	57
R2_1W-17_NI	57	59	59	60
R2_1W-18_NI	56	58	59	59
R2_1W-01A_INB	**68**	**66**	**66**	**67**
R2_1W-01B_INB	**66**	**68**	**69**	**69**
R1_1W-02A_IB	65	**70**	**70**	**71**
R1_1W-02B_IB	64	**71**	**71**	**71**
R2_1W-03A_IB	62	**69**	**68**	**69**
R2_1W-03B_IB	61	**66**	**66**	**67**
R1_1W-11A_IB	64	**70**	**70**	**71**
R1_1W-12A_IB	65	**70**	**71**	**71**
R1_1W-13A_IB	65	**70**	**71**	**71**
R1_1W-15A_IB	65	**70**	**71**	**71**
R1_1W-16A_IB	65	**70**	**70**	**71**
R2_1W-17A_INB	64	**68**	**69**	**69**

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA

The modeled noise levels range from 54 to 68 dBA for the No-Build Condition and from 55 dBA to 71 dBA for the Build Alternatives. The modeled noise levels for the Build Alternatives are equal to or greater than the ADOT NAR noise impact threshold of 66 dBA. Therefore, mitigation evaluation is required for this area. **Appendix A** shows the locations of the modeled noise receivers from **Table 4**.

Van Buren Street to Yuma Road - East

A total of 10 receivers were modeled to represent 27 receptors east of Cotton Lane between Van Buren Street and Yuma Road. **Table 5** shows the results for the receivers.

TABLE 5
MODELED NOISE LEVEL RESULTS
Van Buren Street to Yuma Road - East

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R1_1E-01_NI	57	60	61	61
R1_1E-02_NI	62	60	60	61
R1_1E-03_NI	56	60	60	61
R1_1E-04_NI	58	61	61	62
R1_1E-05_NI	57	61	61	61
R1_1E-06_NI	61	60	60	61
R1_1E-07_NI	56	60	61	61
R1_1E-08_NI	60	60	60	60
R1_1E-09_NI	60	59	59	60
R1_1E-10_NI	54	57	58	58

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA

The modeled noise levels range from 54 to 62 dBA for the No-Build Condition. For Alternative 2C, the modeled noise levels range from 57 dBA to 61 dBA. For Alternative 3, the modeled noise levels range from 58 dBA to 61 dBA. For Alternative 5, the modeled noise levels range from 58 dBA to 62 dBA. The noise impact threshold of 66 dBA was not exceeded for the Build Alternatives at the modeled noise receivers; therefore, mitigation is not needed for this area. **Appendix A** shows the locations of the modeled noise receivers from **Table 5**.

Yuma Road to Lower Buckeye Road - West

A total of 31 receivers were modeled to represent 178 receptors west of Cotton Lane between Yuma Road and Lower Buckeye Road. **Table 6** shows the modeled noise level results for the receivers.

TABLE 6
MODELED NOISE LEVEL RESULTS
Yuma Road to Lower Buckeye Road - West

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R1_2W-01_NINB	**68**	61	62	62
R1_2W-02_NINB	63	60	61	61
R1_2W-03_NINB	61	60	61	61
R1_2W-04_NINB	60	62	62	63
R2_2W-05_NINB	59	64	**65**	65
R2_2W-06_NINB	61	64	**65**	65
R1_2W-07_INB	62	65	**66**	**66**
R1_2W-08_INB	62	65	65	**66**
R1_2W-09_INB	62	65	**66**	**66**
R1_2W-10_IB	64	**70**	**70**	**71**
R1_2W-11_IB	63	**70**	**70**	**70**
R1_2W-12_IB	65	**70**	**70**	**70**
R1_2W-13_IB	**67**	**70**	**71**	**71**
R1_2W-14_INB	**66**	**73**	**74**	**74**
R1_2W-15_INB	63	**72**	**72**	**73**
R1_2W-16_INB	65	**73**	**73**	**74**
R1_2W-17_IB	**66**	**70**	**71**	**71**
R1_2W-18_INB	**67**	**73**	**73**	**74**
R1_2W-19_INB	**70**	**73**	**74**	**74**
R1_2W-20_INB	63	**72**	**73**	**73**
R1_2W-21_INB	64	**72**	**73**	**73**
R1_2W-22_IB	64	**68**	**69**	**69**
R2_2W-23_IB	62	**66**	**67**	**67**
R2_2W-24_NIB	59	64	64	64
R1_2W-25_IB	65	**69**	**70**	**70**
R1_2W-26_INB	**67**	**70**	**71**	**71**
R1_2W-27_INB	63	**70**	**70**	**70**
R1_2W-28_INB	**66**	**68**	**69**	**69**
R1_2W-29_IB	**67**	**68**	**68**	**68**
R1_2W-30_IB	**71**	**66**	**67**	**67**
R2_2W-31_NIB	**66**	63	64	64

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA

The modeled noise levels range from 59 to 71 dBA f for the No-Build Condition. For Alternative 2C, the modeled noise levels range from 60 dBA to 73 dBA. For Alternatives 3 and 5, the modeled noise levels range from 61 dBA to 74 dBA. The modeled noise levels for the Build Alternatives are equal to or greater than the ADOT NAR noise impact threshold of 66 dBA. Therefore, mitigation evaluation is required for this area. **Appendix A** shows the locations of the modeled noise receivers from **Table 6**.

Yuma Road to Lower Buckeye Road - East

A total of 15 receivers were modeled to represent 149 receptors east of Cotton Lane between Yuma Road and Lower Buckeye Road. **Table 7** shows the modeled noise level results for the receivers.

TABLE 7
MODELED NOISE LEVEL RESULTS
Yuma Road to Lower Buckeye Road - East

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R2_2E-01_INB	60	**67**	**68**	**68**
R1_2E-02_INB	61	**72**	**73**	**73**
R1_2E-03_INB	**66**	**67**	**68**	**68**
R1_2E-04_IB	65	**72**	**73**	**73**
R1_2E-05_INB	**67**	**76**	**77**	**77**
R2_2E-06_IB	61	**66**	**67**	**68**
R1_2E-07_IB	63	**71**	**72**	**72**
R1_2E-08_INB	63	**69**	**70**	**71**
R1_2E-09_INB	63	**68**	**69**	**69**
R1_2E-10_IB	64	**69**	**70**	**70**
R1_2E-11_INB	**67**	**72**	**73**	**73**
R1_2E-12_INB	**66**	**70**	**72**	**72**
R1_2E-13_IB	**68**	**69**	**70**	**70**
R2_2E-14_IB	**68**	**66**	**68**	**67**
R2_2E-15_NINB	**68**	64	65	65

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA

The modeled noise levels range from 60 to 68 dBA for the No-Build Condition. For Alternative 2C, the modeled noise levels range from 64 dBA to 72 dBA. For Alternatives 3 and 5, the modeled noise levels range from 65 dBA to 73 dBA. The modeled noise levels for the Build Alternatives are equal to or greater than the ADOT NAR noise impact threshold of 66 dBA. Therefore, mitigation evaluation is required for this area. **Appendix A** shows the locations of the modeled noise receivers from **Table 7**.

Lower Buckeye Road to Broadway Road - West

A total of 22 receivers were modeled to represent 74 receptors west of the future SR303L between Lower Buckeye Road and Broadway Road. **Table 8** shows the modeled noise level results for the receivers.

TABLE 8
MODELED NOISE LEVEL RESULTS
Lower Buckeye Road to Broadway Road - West

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R2_3W-01_NINB	65	64	65	65
R2_3W-02_NINB	64	65	**66**	65
R1_3W-03_IB	64	65	**67**	**66**
R1_3W-04_IB	62	65	**67**	**66**
R1_3W-05_IB	62	**66**	**67**	**66**
R1_3W-06_IB	61	**66**	**67**	**66**
R1_3W-07_INB	60	**66**	**67**	**67**
R1_3W-08_INB	60	**66**	**67**	**66**
R1_3W-09_NIB	61	**66**	**66**	65
R1_3W-10_NI	59	64	64	63
R1_3W-11_NI	60	65	65	64
R1_3W-12_NI	58	65	64	65
R1_3W-13_NI	57	65	64	65
R1_3W-14_NI	57	65	63	65
R1_3W-15_NI	56	65	63	64
R1_3W-16_NI	57	65	62	63
R1_3W-17_NI	57	**67**	**66**	62
R1_3W-18_NI	56	**67**	**67**	61
R1_3W-19_NI	57	**67**	**66**	61
R1_3W-20_NI	56	**67**	--	61
R1_3W-21_NI	57	**66**	--	61
R1_3W-22_NI	58	65	--	58

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA
--- Indicates receivers do not apply to this alternative.

The modeled noise levels range from 56 to 65 dBA for the No-Build Condition. For Alternative 2C, the modeled noise levels range from 64 dBA to 67 dBA. For Alternative 3, the modeled noise levels range from 62 dBA to 67 dBA. For Alternative 5, the modeled noise levels range from 58 dBA to 67 dBA. The modeled noise levels for the Build Alternatives are equal to or greater than the ADOT NAR noise impact threshold of 66 dBA. Therefore, mitigation evaluation is required for this area. **Appendix A** shows the locations of the modeled noise receivers from **Table 8**.

Lower Buckeye Road to Broadway Road - East

A total of up to 27 receivers were modeled to represent 27 areas of undeveloped land (NAC Category G) east of the future SR303L between Lower Buckeye Road and Broadway Road. **Table 9** shows the modeled noise level results for these receivers.

TABLE 9
MODELED NOISE LEVEL RESULTS
Lower Buckeye Road to Broadway Road - East

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R2_3E-01_NI	63	62	64	63
R1_3E-02_NI	63	65	**68**	**67**
R1_3E-03_NI	62	65	**67**	**66**
R1_3E-04_NI	62	65	**68**	**67**
R1_3E-05_I	62	**66**	**68**	**66**
R1_3E-06_I	62	**66**	**68**	**66**
R1_3E-07_I	63	**67**	**68**	**66**
R2_3E-08_NI	60	62	65	62
R2_3E-09_NI	61	63	65	63
R1_3E-10_NI	62	65	**68**	65
R1_3E-11_NI	64	65	**69**	65
R1_3E-12_NI	64	63	**68**	63
R1_3E-13_NI	63	62	65	62
R1_3E-14_NI	62	61	**67**	64
R2_3E-15_NI	62	61	**66**	62
R1_3E-16_NI	--	64	**66**	63
R1_3E-17_NI	--	65	**66**	62
R1_3E-18_NI	--	65	**66**	61
R1_3E-19_I	--	**66**	**--**	60
R1_3E-20_I	--	**66**	--	60
R1_3E-21_NI	--	65	--	60
R1_3E-22_NI	--	65	--	65
R1_3E-23_I	--	--	--	**66**
R1_3E-24_I	--	--	--	**66**
R1_3E-25_NI	--	--	--	65
R1_3E-26_NI	--	--	--	65
R1_3E-27_NI	--	--	--	65

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA
--- Indicates receivers do not apply to this alternative.

The modeled noise levels range from 60 to 64 dBA for the for the No-Build Condition. For Alternative 2C, the modeled noise levels range from 61 dBA to 67 dBA. For Alternative 3, the modeled noise levels range from 64 dBA to 69 dBA. For Alternative 5, the modeled noise levels range from 60 dBA to 67 dBA. **Appendix A** shows the locations of the modeled noise receivers from **Table 9**.

Broadway Road to North of SR30 – West

A total of up to 30 receivers were modeled to represent 30 areas of undeveloped land (NAC Category G) west of the future SR303L between Broadway Road and north of the future SR30. **Table 10** shows the modeled noise level results for these receivers.

TABLE 10
MODELED NOISE LEVEL RESULTS
Broadway Road to North of SR30 - West

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R1_4W-01_NI	--	59	**66**	55
R1_4W-02_NI	--	60	65	57
R1_4W-03_NI	--	62	63	58
R1_4W-04_NI	--	61	62	59
R1_4W-05_NI	--	60	61	59
R1_4W-06_NI	--	60	60	59
R1_4W-07_NI	--	60	58	60
R1_4W-08_NI	--	60	57	60
R1_4W-09_NI	--	59	58	59
R1_4W-10_NI	--	57	59	60
R1_4W-11_NI	--	57	60	61
R1_4W-12_NI	--	59	61	62
R1_4W-13_NI	--	62	62	63
R1_4W-14_NI	--	63	64	63
R1_4W-15_NI	--	64	65	64
R1_4W-16_NI	--	65	65	64
R1_4W-17_NI	--	**66**	**66**	64
R1_4W-18_I	--	**67**	**66**	**66**
R1_4W-19_I	--	**68**	**66**	**66**
R1_4W-20_I	--	**68**	**66**	**66**
R1_4W-21_I	--	**68**	65	**67**
R1_4W-22_I	--	**68**	65	**67**
R1_4W-23_I	--	--	64	**66**
R1_4W-24_NI	--	--	64	--
R1_4W-25_NI	--	--	65	--
R1_4W-26_NI	--	--	65	--
R1_4W-27_I	--	--	**66**	--
R1_4W-28_I	--	--	**66**	--
R1_4W-29_NI	--	--	65	--
R1_4W-30_NI	--	--	65	--

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA
--- Indicates receivers do not apply to this alternative.

For Alternative 2C, the modeled noise levels range from 57 dBA to 68 dBA. For Alternative 3, the modeled noise levels range from 57 dBA to 66 dBA. For Alternative 5, the modeled noise levels range from 55 dBA to 67 dBA. **Appendix A** shows the locations of the modeled noise receivers from **Table 10**.

Broadway Road to North of SR30 –East

A total of up to 35 receivers were modeled to represent 35 areas of undeveloped land (NAC Category G) east of the future SR303L between Broadway Road and north of the future SR30. **Table 11** shows the modeled noise level results for these receivers.

TABLE 11
MODELED NOISE LEVEL RESULTS
Broadway Road to North of SR30 - East

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R1_4E-01_NI	--	65	**66**	59
R1_4E-02_NI	--	64	64	59
R1_4E-03_NI	--	63	64	59
R1_4E-04_NI	--	62	64	58
R1_4E-05_NI	--	61	65	57
R1_4E-06_NI	--	61	64	58
R1_4E-07_NI	--	61	63	57
R1_4E-08_NI	--	62	64	57
R1_4E-09_NI	--	62	**66**	56
R1_4E-10_NI	--	63	**69**	56
R1_4E-11_NI	--	63	**69**	57
R1_4E-12_NI	--	64	**70**	58
R1_4E-13_NI	--	65	**70**	59
R1_4E-14_NI	--	**66**	--	59
R1_4E-15_NI	--	**66**	--	60
R1_4E-16_NI	--	**66**	--	61
R1_4E-17_NI	--	**68**	--	62
R1_4E-18_NI	--	**68**	--	62
R1_4E-19_NI	--	**69**	--	63
R1_4E-20_NI	--	**68**	--	64
R1_4E-21_NI	--	**68**	--	64
R1_4E-22_NI	--	**68**	--	63
R1_4E-23_NI	--	**69**	--	65
R1_4E-24_NI	--	**70**	--	65
R1_4E-25_I	--	**70**	--	**66**
R1_4E-26_I	--	**70**	--	**67**
R1_4E-27_I	--	--	--	**67**
R1_4E-28_I	--	--	--	**68**
R1_4E-29_I	--	--	--	**68**
R1_4E-30_I	--	--	--	**68**
R1_4E-31_I	--	--	--	**69**
R1_4E-32_I		--	--	**70**
R1_4E-33_I	--	--	--	**71**
R1_4E-34_I	--	--	--	**71**
R1_4E-35_I	--	--	--	**70**

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA
--- Indicates receivers do not apply to this alternative.

For Alternative 2C, the modeled noise levels range from 61 dBA to 70 dBA. For Alternative 3, the modeled noise levels range from 63 dBA to 70 dBA. For Alternative 5, the modeled noise levels range from 56 dBA to 71 dBA. **Appendix A** shows the locations of the modeled noise receivers from **Table 11**.

South of SR30 - West

A total of up to 31 receivers were modeled to represent 31 areas of undeveloped land (NAC Category G) west of the future SR303L and south of the future SR30. **Table 12** shows the modeled noise level results for these receivers.

TABLE 12
MODELED NOISE LEVEL RESULTS
South of SR30 - West

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R1_5W-01_NI	--	**68**	64	**67**
R1_5W-02_NI	--	**68**	65	**67**
R1_5W-03_NI	--	**68**	65	**67**
R1_5W-04_NI	--	**66**	65	**67**
R1_5W-05_NI	--	65	65	65
R1_5W-06_NI	--	64	64	64
R1_5W-07_NI	--	62	64	63
R1_5W-08_NI	--	60	64	60
R1_5W-09_NI	--	58	65	57
R1_5W-10_NI	--	59	65	56
R1_5W-11_I	--	56	**66**	55
R1_5W-12_I	--	55	**66**	53
R1_5W-13_I	--	54	**66**	52
R1_5W-14_NI	--	53	65	52
R1_5W-15_NI	--	53	65	51
R1_5W-16_NI	--	52	64	51
R1_5W-17_NI	--	52	63	50
R1_5W-18_NI	--	51	61	50
R1_5W-19_NI	--	--	60	--
R1_5W-20_NI	--	--	59	--
R1_5W-21_NI	--	--	57	--
R1_5W-22_NI	--	--	56	--
R1_5W-23_NI	--	--	55	--
R1_5W-24_NI	--	--	54	--
R1_5W-25_NI	--	--	55	--
R1_5W-26_NI	--	--	55	--
R1_5W-27_NI	--	--	54	--
R1_5W-28_NI	--	--	52	--
R1_5W-29_NI	--	--	51	--
R1_5W-30_NI	--	--	50	--
R1_5W-31_NI	--	--	49	--

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA
--- Indicates receivers do not apply to this alternative.

For Alternative 2C, the modeled noise levels range from 51 dBA to 68 dBA. For Alternative 3, the modeled noise levels range from 49 dBA to 66 dBA. For Alternative 5, the modeled noise levels range from 50 dBA to 67 dBA. **Appendix A** shows the locations of the modeled noise receivers from **Table 12.**

South of SR30 - East

A total of up to 33 receivers were modeled to represent 33 areas of undeveloped land (NAC Category G) east of the future SR303L and south of the future SR30. **Table 13** shows the modeled noise level results for these receivers.

TABLE 13
MODELED NOISE LEVEL RESULTS
South of SR30 - East

Receiver	Modeled Noise Levels, L_{Aeq1h}			
	No-Build 2040	**Build 2040 Alternative 2C**	**Build 2040 Alternative 3**	**Build 2040 Alternative 5**
R1_5E-01_I	--	**70**	**70**	**70**
R1_5E-02_I	--	**70**	**70**	**70**
R1_5E-03_I	--	**70**	**69**	**72**
R1_5E-04_I	--	**69**	**67**	**69**
R1_5E-05_I	--	**68**	64	**66**
R1_5E-06_I	--	**67**	63	64
R1_5E-07_I	--	**67**	61	63
R1_5E-08_I	--	**67**	60	64
R1_5E-09_I	--	**67**	60	65
R1_5E-10_I	--	**67**	59	64
R1_5E-11_I	--	**66**	57	61
R1_5E-12_I	--	**66**	55	59
R1_5E-13_I	--	**66**	53	58
R1_5E-14_NI	--	64	52	56
R1_5E-15_NI	--	63	51	55
R1_5E-16_NI	--	62	51	53
R1_5E-17_NI	--	61	--	51
R1_5E-18_NI	--	60	--	50
R1_5E-19_NI	--	60	--	50
R1_5E-20_NI	--	59	--	51
R1_5E-21_NI	--	58	--	53
R1_5E-22_NI	--	57	--	55
R1_5E-23_NI	--	56	--	53
R1_5E-24_NI	--	55	--	51
R1_5E-25_NI	--	53	--	50
R1_5E-26_NI	--	51	--	48
R1_5E-27_NI	--	50	--	47
R1_5E-28_NI	--	49	--	47
R1_5E-29_NI	--	49	--	47
R1_5E-30_NI	--	49	--	45
R1_5E-31_NI	--	48	--	45
R1_5E-32_NI	--	48	--	44
R1_5E-33_NI	--	47	--	--

Note: **Bolded** values are equal to or greater than ADOT NAR noise impact threshold of 66 dBA
--- Indicates receivers do not apply to this alternative.

For Alternative 2C, the modeled noise levels range from 47 dBA to 70 dBA. For Alternative 3, the modeled noise levels range from 51 dBA to 70 dBA. For Alternative 5, the modeled noise levels range from 44 dBA to 72 dBA. **Appendix A** shows the locations of the modeled noise receivers from **Table 13.**

10.0 MITIGATION ANALYSIS

The ADOT NAR provides guidelines for noise abatement analysis. These guidelines have two components, feasibility and reasonableness. The feasibility components consist of the engineering and acoustic features which address safety, barrier height, topography, drainage, utilities, maintenance requirements, property access and overall project purpose, and encompasses the constructability of the noise abatement. To be acoustically feasible, the noise abatement must achieve at least a 5-dBA reduction at 50 percent of the impacted receptors.

There are three factors that must be met for a noise abatement action to be considered reasonable. The first factor is based on the viewpoints or preferences of the property owners and residents. The viewpoints of the property owners and residents shall be taken into account when determining whether the barrier should be constructed or not. The second is based on the noise reduction design goal; the ADOT NAR states that the noise barrier should be designed to reduce the projected unmitigated noise levels by at least 7 dBA for 50 percent of the benefited receptors closest to the transportation facility. The third factor is based on the cost effectiveness of the noise abatement. The maximum reasonable cost of abatement is $49,000 per benefited receptor (cost-per-benefited-receptor) with barrier costs calculated at $35 per square foot, $85 per square foot if constructed on a structure.

The ADOT NAR defines *“benefited receptor”* as the recipient of an abatement measure that receives a noise reduction of at least 5 dBA. This would allow a receptor that is not impacted to be considered as a *“benefited receptor”* if it receives a noise reduction of at least 5 dBA from the noise abatement. The *“benefited receptor”* would be included in the determination of the cost of the noise abatement.

Lands and proposed residential developments permitted after the Date of Public Knowledge for this project will not be eligible for abatement (noise barriers). The Date of Public Knowledge is the date of approval of the EA for this project, as defined in the ADOT NAR. Permitted is defined as a definite commitment to develop land with an approved specific design of land use activities as evidenced by the issuance of a building permit by the City of Goodyear.

Van Buren Road to Yuma Road - West

Mitigation was evaluated for the Build Condition of Alternatives 2C, 3, and 5. **Table 14** shows the results of the noise level mitigation analysis for receptors west of Cotton Lane between Van Buren Road and Yuma Road.

TABLE 14
NOISE MITIGATION
VAN BUREN ROAD TO YUMA ROAD - WEST

Receiver	Number of Representative Receptors	Alternatives 2C Modeled Noise Level, L_{Aeq1h}		Insertion Loss, dBA	Mitigation
		Build 2040	Mitigated		
R2_1W-01A	3	**66**	63	3	Barrier W1 is potentially recommended
R2_1W-01B	17	**68**	64	4	
R1_1W-02A	36	**70**	64	6	
R1_1W-02B	39	**71**	64	7	
R2_1W-03A	17	**69**	63	6	
R2_1W-03B	4	**66**	61	5	
R1_1W-11A	6	**70**	63	7	Barriers W2A & W2B are potentially recommended
R1_1W-12A	11	**70**	63	7	
R1_1W-13A	12	**70**	63	7	
R1_1W-15A	12	**70**	63	7	
R1_1W-16A	11	**70**	63	7	
R1_1W-17A	5	**68**	62	6	
Alternative 3 Modeled Noise Level, L_{Aeq1h}					
R2_1W-01A	3	**66**	63	3	Barrier W1 is potentially recommended
R2_1W-01B	17	**69**	65	4	
R1_1W-02A	36	**70**	64	6	
R1_1W-02B	39	**71**	64	7	
R2_1W-03A	17	**68**	64	4	
R2_1W-03B	4	**66**	62	4	
R1_1W-11A	6	**70**	63	7	Barriers W2A & W2B are potentially recommended
R1_1W-12A	11	**71**	64	7	
R1_1W-13A	12	**71**	64	7	
R1_1W-15A	12	**71**	64	7	
R1_1W-16A	11	**70**	64	6	
R1_1W-17A	5	**69**	63	6	
Alternative 5 Modeled Noise Level, L_{Aeq1h}					
R2_1W-01A	3	**67**	63	4	Barrier W1 is potentially recommended
R2_1W-01B	17	**69**	65	4	
R1_1W-02A	36	**71**	64	7	
R1_1W-02B	39	**71**	64	7	
R2_1W-03A	17	**69**	64	5	
R2_1W-03B	4	**67**	62	5	
R1_1W-11A	6	**71**	64	7	Barriers W2A & W2B are potentially recommended
R1_1W-12A	11	**71**	65	6	
R1_1W-13A	12	**71**	64	7	
R1_1W-15A	12	**71**	64	7	
R1_1W-16A	11	**71**	64	7	
R1_1W-17A	5	**69**	63	6	

Note: **Bolded** value is equal to or greater than the noise impact threshold of 66 dBA

Table 15 shows the noise barrier summary for barriers W1, W2A, and W2B. For the receptors west of Cotton Lane between Yuma Road and Lower Buckeye Road, there are an estimated 173 receptors that are impacted. Barrier W1 is potentially recommended for a new development, *Christopher Todd Communities at Canyon Trails*, if building permits are issued before the approval of the final EA for the project. Barriers W2A & W2B are potentially recommended for new development of *Mattamy Canyon Trails, Crestwood at Canyon Trails*, if building permits are issued before the approval of the final EA for the project. Barriers W1, W2A, and W2B are recommended for all three alternatives.

TABLE 15
NOISE BARRIER SUMMARY
VAN BUREN ROAD TO YUMA ROAD - WEST

Barrier	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	%FR[3]	%BR[4]	CPBR[5]
Alternative 2C								
W1	12	1,400	16,801	$678,035	96	53%	83%	$7,063
W2A	14-16	1,400	21,600	$756,000	57	92%	100%	$25,297
W2B	14	1,400	19,598	$685,930				
				Total:	**$2,119,965**			
Alternative 3								
W1	12	1,400	16,801	$678,035	75	53%	65%	$9,040
W2A	12-14	1,600	21,600	$756,000	57	77%	100%	$24,806
W2B	14	1,400	18,799	$657,965				
				Total:	**$2,092,000**			
Alternative 5								
W1	12-14	1,400	18,401	$749,035	96	100%	83%	$7,802
W2A	12-14	1,600	22,000	$770,000	57	54%	100%	$24,806
W2B	12-14	1,400	18,398	$643,930				
				Total:	**$2,162,965**			

1. Wall cost based on $35/ft^2 for off-structure barrier and $85/ft^2 for on-structure barrier W1.
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. %FR - percentage of First Row Receptors with 7+ dBA noise reduction
4. %BR - percentage of Benefited Receptors with 5+ dBA noise reduction
5. CPBR- cost per benefited receptor

Yuma Road to Lower Buckeye Road - West

Mitigation was evaluated for the Build Condition of Alternatives 2C, 3, and 5. **Table 16** shows the results of the noise level mitigation analysis for receptors west of Cotton Lane between Yuma Road and Lower Buckeye Road.

TABLE 16
NOISE MITIGATION
YUMA ROAD TO LOWER BUCKEYE ROAD- WEST

Receiver	Number of Representative Receptors	Alternatives 2C Modeled Noise Level, L_{Aeq1h}		Insertion Loss, dBA	Mitigation
		Build 2040	Mitigated		
R1_2W-01	3	61	61	0	Barriers W4A & W4B are recommended
R1_2W-02	2	60	59	1	
R1_2W-03	2	60	59	1	
R1_2W-04	2	62	60	2	
R2_2W-05	3	64	62	2	
R2_2W-06	3	64	61	3	
R1_2W-07	2	65	61	4	
R1_2W-08	5	65	61	4	
R1_2W-09	3	65	62	3	
R1_2W-10	5	**70**	64	6	
R1_2W-11	10	**70**	65	5	
R1_2W-12	12	**70**	65	5	
R1_2W-13	6	**70**	64	6	
R1_2W-14	9	**73**	**66**	7	
R1_2W-15	12	**72**	65	7	
R1_2W-16	9	**73**	65	8	
R1_2W-17	5	**70**	64	6	
R1_2W-18	9	**73**	65	8	
R1_2W-19	4	**73**	**66**	7	
R1_2W-20	7	**72**	65	7	
R1_2W-21	10	**72**	65	7	
R1_2W-22	8	**68**	63	5	
R2_2W-23	2	**66**	62	4	
R2_2W-24	2	64	60	4	
R1_2W-25	6	**69**	64	5	
R1_2W-26	7	**70**	63	7	
R1_2W-27	12	**70**	62	8	
R1_2W-28	3	**68**	61	7	
R1_2W-29	9	**68**	61	7	
R1_2W-30	3	**66**	62	4	
R2_2W-31	3	63	59	4	
Alternative 3 Modeled Noise Level, L_{Aeq1h}					
R1_2W-01	3	62	61	1	Barriers W4A & W4B are recommended
R1_2W-02	2	61	60	1	
R1_2W-03	2	61	59	2	
R1_2W-04	2	62	60	2	
R2_2W-05	3	65	62	3	
R2_2W-06	3	65	62	3	
R1_2W-07	2	**66**	62	4	
R1_2W-08	5	65	62	3	
R1_2W-09	3	**66**	62	4	
R1_2W-10	5	**70**	64	6	
R1_2W-11	10	**70**	64	6	
R1_2W-12	12	**70**	63	7	
R1_2W-13	6	**71**	63	8	

Receiver	Number of Representative Receptors	Alternatives 2C Modeled Noise Level, L_{Aeq1h}		Insertion Loss, dBA	Mitigation
		Build 2040	Mitigated		
R1_2W-14	9	**74**	65	9	Barriers W4A & W4B are recommended
R1_2W-15	12	**72**	64	8	
R1_2W-16	9	**73**	64	9	
R1_2W-17	5	**71**	63	8	
R1_2W-18	9	**73**	65	8	
R1_2W-19	4	**74**	**66**	8	
R1_2W-20	7	**73**	65	8	
R1_2W-21	10	**73**	65	8	
R1_2W-22	8	**69**	64	5	
R2_2W-23	2	**67**	63	4	
R2_2W-24	2	64	61	3	
R1_2W-25	6	**70**	65	5	
R1_2W-26	7	**71**	64	7	
R1_2W-27	12	**70**	63	7	
R1_2W-28	3	**69**	62	7	
R1_2W-29	9	**68**	63	5	
R1_2W-30	3	**67**	63	4	
R2_2W-31	3	64	60	4	
Alternative 5 Modeled Noise Level, L_{Aeq1h}					
R1_2W-01	3	62	61	1	Barriers W4A & W4B are recommended
R1_2W-02	2	61	60	1	
R1_2W-03	2	61	59	2	
R1_2W-04	2	63	61	2	
R2_2W-05	3	65	62	3	
R2_2W-06	3	65	62	3	
R1_2W-07	2	**66**	62	4	
R1_2W-08	5	**66**	62	4	
R1_2W-09	3	**66**	62	4	
R1_2W-10	5	**71**	64	7	
R1_2W-11	10	**70**	64	6	
R1_2W-12	12	**70**	64	6	
R1_2W-13	6	**71**	64	7	
R1_2W-14	9	**74**	**66**	8	
R1_2W-15	12	**73**	65	8	
R1_2W-16	9	**74**	65	9	
R1_2W-17	5	**71**	64	7	
R1_2W-18	9	**74**	65	9	
R1_2W-19	4	**74**	**66**	8	
R1_2W-20	7	**73**	65	8	
R1_2W-21	10	**73**	65	8	
R1_2W-22	8	**69**	62	7	
R2_2W-23	2	**67**	61	6	
R2_2W-24	2	64	59	5	
R1_2W-25	6	**70**	63	7	
R1_2W-26	7	**71**	63	8	
R1_2W-27	12	**70**	62	8	
R1_2W-28	3	**69**	61	8	
R1_2W-29	9	**68**	61	7	
R1_2W-30	3	**67**	62	5	
R2_2W-31	3	64	59	5	

Note: **Bolded** value is equal to or greater than the noise impact threshold of 66 dBA

Table 17 shows the noise barrier summary for barriers W4A and W4B. There are an estimated 178 receptors that are impacted west of Cotton Lane between Yuma Road and Lower Buckeye Road. Barriers W4A & W4B are potentially recommended to provide mitigation to the Cottonwood Community for all three alternatives.

TABLE 17
NOISE BARRIER SUMMARY
YUMA ROAD TO LOWER BUCKEYE - WEST

Barrier	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	%FR[3]	%BR[4]	CPBR[5]
Alternative 2C								
W4A	12-14	4,200	53,199	$1,861,965	113	55%	99%	$22,905
W4B	12-14	1,425	18,351	$726,285				
			Total:	**$2,588,250**				
Alternative 3								
W4A	10-16	4,200	56,399	$1,973,965	72	56%	94%	$35,566
W4B	10-12	1,425	15,051	$586,785				
			Total:	**$2,560,750**				
Alternative 5								
W4A	10-16	4,200	56,799	$1,987,965	71	71%	94%	$39,018
W4B	14	1,425	19,951	$782,285				
			Total:	**$2,770,250**				

1. Wall cost based on $35/ft^2 for off-structure barrier and $85/ft^2 for on-structure barrier W4B.
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. %FR - percentage of First Row Receptors with 7+ dBA noise reduction
4. %BR - percentage of Benefited Receptors with 5+ dBA noise reduction
5. CPBR- cost per benefited receptor

Yuma Road to Lower Buckeye Road - East

Mitigation was evaluated for the Build Condition of Alternatives 2C, 3, and 5. **Table 18** shows the results of the noise level mitigation analysis for receptors east of Cotton Lane between Yuma Road and Lower Buckeye Road.

TABLE 18
NOISE MITIGATION
YUMA ROAD TO LOWER BUCKEYE ROAD- EAST

Receiver	Number of Representative Receptors	Alternatives 2C Modeled Noise Level, L_{Aeq1h}		Insertion Loss, dBA	Mitigation
		Build 2040	Mitigated		
R2_2E-01	3	**67**	63	4	Barriers E1 & E2 are recommended
R1_2E-02	4	**72**	63	9	
R1_2E-03	15	**67**	59	8	
R1_2E-04	13	**72**	65	7	
R1_2E-05	19	**76**	**66**	10	
R2_2E-06	6	**66**	61	5	
R1_2E-07	7	**71**	64	7	
R1_2E-08	15	**69**	61	8	
R1_2E-09	21	**68**	60	8	
R1_2E-10	8	**69**	63	6	
R1_2E-11	14	**72**	64	8	
R1_2E-12	14	**70**	63	7	
R1_2E-13	3	**69**	62	7	
R2_2E-14	5	**66**	61	5	
R2_2E-15	2	64	60	4	
Alternative 3 Modeled Noise Level, L_{Aeq1h}					
R2_2E-01	3	**68**	64	4	Barriers E1 & E2 are recommended
R1_2E-02	4	**73**	63	10	
R1_2E-03	15	**68**	61	7	
R1_2E-04	13	**73**	65	8	
R1_2E-05	19	**77**	**66**	11	
R2_2E-06	6	**67**	62	5	
R1_2E-07	7	**72**	65	7	
R1_2E-08	15	**70**	63	7	
R1_2E-09	21	**69**	62	7	
R1_2E-10	8	**70**	64	6	
R1_2E-11	14	**73**	65	8	
R1_2E-12	14	**72**	64	8	
R1_2E-13	3	**70**	63	7	
R2_2E-14	5	**68**	62	6	
R2_2E-15	2	65	61	4	
Alternative 5 Modeled Noise Level, L_{Aeq1h}					
R2_2E-01	3	**68**	64	4	Barriers E1 & E2 are recommended
R1_2E-02	4	**73**	64	9	
R1_2E-03	15	**68**	60	8	
R1_2E-04	13	**73**	**66**	7	
R1_2E-05	19	**77**	**67**	10	
R2_2E-06	6	**68**	62	6	
R1_2E-07	7	**72**	65	7	
R1_2E-08	15	**71**	63	8	
R1_2E-09	21	**69**	61	8	
R1_2E-10	8	**70**	64	6	
R1_2E-11	14	**73**	65	8	
R1_2E-12	14	**72**	64	8	
R1_2E-13	3	**70**	63	7	
R2_2E-14	5	**67**	62	5	
R2_2E-15	2	65	61	4	

Note: **Bolded** value is equal to or greater than the noise impact threshold of 66 dBA

Table 19 shows the noise barrier summary for barriers E1 and E2. There are an estimated 149 receptors that are impacted east of Cotton Lane between Yuma Road and Lower Buckeye Road. Barriers E1 & E2 are potentially recommended to provide mitigation to Canyon Trails South, Journey Coronado, Sunset, and Sierra Pointe Communities for all three alternatives.

TABLE 19
NOISE BARRIER SUMMARY
YUMA ROAD TO LOWER BUCKEYE - EAST

Barrier	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	%FR[3]	%BR[4]	CPBR[5]
Alternative 2C								
E1	10	400	4,000	$140,000	56	93%	98%	$32,571
E2	10-12	4,200	46,400	$1,684,000				
			Total:	**$1,824,000**				
Alternative 3								
E1	10	400	4,000	$140,000	80	93%	98%	$24,200
E2	10-14	4,200	49,600	$1,796,000				
			Total:	**$1,936,000**				
Alternative 5								
E1	10	400	4,000	$140,000	42	93%	98%	$44,762
E2	10-14	4,200	48,000	$1,740,000				
			Total:	**$1,880,000**				

1. Wall cost based on $35/ft^2 for off-structure barrier and $85/ft^2 for on-structure barrier E2.
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. %FR - percentage of First Row Receptors with 7+ dBA noise reduction
4. %BR - percentage of Benefited Receptors with 5+ dBA noise reduction
5. CPBR- cost per benefited receptor

Lower Buckeye Road to Broadway Road - West

Mitigation was evaluated for the Build Condition of Alternatives 2C, 3, and 5. **Table 20** shows the results of the noise level mitigation analysis western of the future SR303L between Lower Buckeye Road and Broadway Road.

TABLE 20
NOISE MITIGATION
LOWER BUCKEYE ROAD TO BROADWAY ROAD - WEST

Receiver	Number of Representative Receptors	Alternatives 2C Modeled Noise Level, L_{Aeq1h}		Insertion Loss, dBA	Mitigation
		Build 2040	Mitigated		
R2_3W-01	3	64	60	4	Barrier W5 is potentially recommended
R2_3W-02	3	65	60	5	
R1_3W-03	3	65	60	5	
R1_3W-04	15	65	59	6	
R1_3W-05	3	**66**	59	7	
R1_3W-06	8	**66**	59	7	
R1_3W-07	4	**66**	60	6	
R1_3W-08	4	**66**	59	7	
R1_3W-09	2	**66**	59	7	
Alternative 3 Modeled Noise Level, L_{Aeq1h}					
R2_3W-01	3	65	61	4	Barrier W5 is potentially recommended
R2_3W-02	3	**66**	61	5	
R1_3W-03	3	**67**	61	6	
R1_3W-04	15	**67**	60	7	
R1_3W-05	3	**67**	61	6	
R1_3W-06	8	**67**	60	7	
R1_3W-07	4	**67**	60	7	
R1_3W-08	4	**67**	60	7	
R1_3W-09	2	**66**	60	6	
Alternative 5 Modeled Noise Level, L_{Aeq1h}					
R2_3W-01	3	**68**	64	4	Barrier W5 is potentially recommended
R2_3W-02	4	**73**	64	9	
R1_3W-03	15	**68**	60	8	
R1_3W-04	13	**73**	**66**	7	
R1_3W-05	19	**77**	**67**	10	
R1_3W-06	6	**68**	62	6	
R1_3W-07	7	**72**	65	7	
R1_3W-08	15	**71**	63	8	
R1_3W-09	21	**69**	61	8	

Note: **Bolded** value is equal to or greater than the noise impact threshold of 66 dBA

Table 21 shows the noise barrier summary for barriers W5 & W6. There are an estimated 45 receptors are impacted west of the future SR303L between Lower Buckeye Road and Broadway Road Barriers W5 & W6 are potentially recommended for the new development, *El Cidro (Phase 1 Parcel 2)*, if building permits are issued before the approval of the final EA for the project. Barrier W5 is recommended for all three alternatives. Barrier W6 is recommended for Alternative 5.

TABLE 21
NOISE BARRIER SUMMARY
LOWER BUCKEYE TO BROADWAY - WEST

Barrier	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	%FR[3]	%BR[4]	CPBR[5]
Alternative 2C								
W5	12-18	2,550	38,100	$1,333,500	42	56%	100%	$31,750
			Total:	**$1,333,500**				
Alternative 3								
W5	14-16	2,400	34,399	$1,203,965	42	63%	100%	$28,666
			Total:	**$1,203,965**				
Alternative 5								
W5	14	2,468	34,551	$1,209,285	31	50%	100%	$42,396
W6	10	300	3,000	$105,000				
			Total:	**$1,314,285**				

1. Wall cost based on $35/ft^2$
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. %FR - percentage of First Row Receptors with 7+ dBA noise reduction
4. %BR - percentage of Benefited Receptors with 5+ dBA noise reduction
5. CPBR- cost per benefited receptor

11.0 CONSTRUCTION NOISE AND VIBRATION

Construction noise is anticipated for roadway improvement projects and lasts for the duration of the construction. Construction activities are generally of a short-term nature. Depending on the nature of construction operations, the duration of the noise could last from seconds (e.g., a truck passing a customer) to months (e.g., constructing a bridge). Construction noise is also intermittent and depends on the type of operation, location, and function of the equipment and the equipment usage cycle. Table 22 shows the overall predicted maximum noise level (L_{max}) of the construction equipment at 50 feet for different phases of roadway construction.

TABLE 22
CONSTRUCTION EQUIPMENT NOISE[1]

Phase	Equipment	Noise Limit (L_{max}) At 50 feet, dBA
Site Clearing	Dozer	85
	Backhoe	80
Grading & Earthwork	Scraper	85
	Grader	85
Foundation	Backhoe	80
	Front Loader	80
Base Preparation	Compressor (air)	80
	Dozer	85

1. Source- FHWA Highway Construction Noise Handbook, page 3; August 2006

ADOT has set forth guidelines for construction noise in the Standard Specifications for Road and Bridge Construction, 2008. Per ADOT specifications 104.08, Prevention of Air and Noise Pollution:

"The contractor shall comply with all local sound control and noise rules, regulations and ordinances which apply to any work pursuant to the contract.

Each internal combustion engine used for any purpose on the work or related to the work shall be equipped with a muffler or a type recommended by the manufacturer. No internal combustion engine shall be operated on the work without its muffler being in good working condition."

Ground vibration and ground-born noise can also be a source of annoyance to individuals who live or work close to vibration-generating activities. Pile driving, demolition activity, blasting, and crack-and-seat operations are the primary sources of vibration, while the impact pile driving can be the most significant source of vibration at construction sites. It is recommended to apply methods that may be practical and appropriate in specific situations, to reduce vibration to an acceptable level.

12.0 COORDINATION WITH LOCAL OFFICIALS

Throughout the preparation of this noise analysis technical report, the consultant has been in communication with City of Goodyear officials to confirm all potential new developments being planned within the project corridor for inclusion in this analysis.

13.0 STATEMENT OF LIKELIHOOD

The FHWA-approved TNM2.5 was used to evaluate traffic noise for the Existing, No-Build, and Build Conditions. Noise impacts occurred at receptors located both east and west of Cotton Lane (future SR303L) from Yuma Road to SR 30. Tables 23, 24, and 25 show the recommended noise barriers for Alternatives 2C, 3, and 5, respectively. A final determination of noise abatement measures will be made upon completion of the project design, the public involvement process, concurrence with the ADOT NAR, and FHWA approval.

TABLE 23

RECOMMENDED NOISE BARRIER SUMMARY

ALTERNATIVE 2C

Barrier Description	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	CPBR[3]
Barrier W1 (Sta 1281+57 to 1267+47)	12	1,400	16,801	$678,035	96	$7,063
Barrier W2A (Sta 1254+19 to 1240+46)	14-16	1,400	21,600	$756,000	57	$25,297
Barrier W2B (Sta 1242+52 to 1228+45)	14	1,400	19,598	$685,930		
Barrier E1 (Sta 1216+29 to 1212+30)	10	400	4,000	$140,000	56	$32,571
Barrier E2 (Sta 1212+87 to 1170+99)	10-12	4,200	46,400	$1,684,000		
Barrier W4A (Sta 1224+10 to 1182+11)	12-14	4,200	53,199	$1,861,965	113	$22,905
Barrier W4B (Sta 1183+88 to 1169+45)	12-14	1,425	18,351	$726,285		
Barrier W5 (Sta 1171+44 to 1145+30)	12-18	2,550	38,100	$1,333,500	42	$31,750
	Totals:	**16,975**	**218,049**	**$7,865,715**	**364**	**$21,609**

1. Wall cost based on $35/ft^2 for off-structure barrier and $85/ft^2 for on-structure barrier W1, E2, and W4B.
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. CPBR- cost per benefited receptor

TABLE 24

RECOMMENDED NOISE BARRIER SUMMARY

ALTERNATIVE 3

Barrier Description	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	CPBR[3]
Barrier W1 (Sta 1281+57 to 1267+47)	12	1,400	16,801	$678,035	75	$9,040
Barrier W2A (Sta 1256+19 to 1240+46)	12-14	1,600	21,600	$756,000	57	$24,806
Barrier W2B (Sta 1242+52 to 1228+45)	14-14	1,400	18,799	$657,965		
Barrier E1 (Sta 1216+29 to 1212+30)	10	400	4,000	$140,000	80	$24,200
Barrier E2 (Sta 1212+87 to 1170+99)	10-14	4,200	49,600	$1,796,000		
Barrier W4A (Sta 1224+10 to 1182+11)	10-16	4,200	56,399	$1,973,965	72	$35,566
Barrier W4B (Sta 1183+88 to 1169+45)	10-12	1,425	15,051	$586,785		
Barrier W5 (Sta 1173+39 to 1149+37)	14-16	2,400	34,399	$1,203,965	42	$28,666
	Totals:	**17,025**	**216,649**	**$7,792,715**	**326**	**$23,904**

1. Wall cost based on $35/ft^2 for off-structure barrier and $85/ft^2 for on-structure barrier W1, E2, and W4B.
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. CPBR- cost per benefited receptor

TABLE 25

RECOMMENDED NOISE BARRIER SUMMARY

ALTERNATIVE 5

Barrier Description	Height Range, ft	Length, ft	Area, ft^2	Barrier Cost[1]	NBR[2]	CPBR[3]
Barrier W1 (Sta 1281+57 to 1267+47)	12-14	1,400	18,401	$749,035	96	$7,802
Barrier W2A (Sta 1256+19 to 1240+46)	12-14	1,600	22,000	$770,000	57	$24,806
Barrier W2B (Sta 1242+52 to 1228+45)	12-14	1,400	18,398	$643,930		
Barrier E1 (Sta 1216+29 to 1212+30)	10	400	4,000	$140,000	42	$44,762
Barrier E2 (Sta 1212+87 to 1170+99)	10-14	4,200	48,000	$1,740,000		
Barrier W4A (Sta 1224+10 to 1182+11)	10-16	4,200	56,799	$1,987,965	71	$39,018
Barrier W4B (Sta 1183+88 to 1169+45)	14	1,425	19,951	$782,285		
Barrier W5 (Sta 1169+45 to 1143+26)	14	2,468	34,551	$1,209,285	31	$42,396
Barrier W6 (Sta 1165+28 to 1168+36)	10	300	3,000	$105,000		
	Totals:	**17,393**	**225,100**	**$8,127,500**	**297**	**$27,365**

1. Wall cost based on $35/$ft^2$ for off-structure barrier and $85/$ft^2$ for on-structure barrier W1, E2, and W4B.
2. NBR - number of benefited receptors; Receptors with 5-7 dBA insertion loss within 500 ft from the R/W are accounted as benefited receptors.
3. CPBR- cost per benefited receptor

The total mitigation cost for Alternative 2C is $7,865,715. The total mitigation cost for Alternative 3 is $7,792,715. The total mitigation cost for Alternative 5 is $8,127,500

APPENDIX A – RECEIVER, MONITORING, AND BARRIER LOCATONS

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

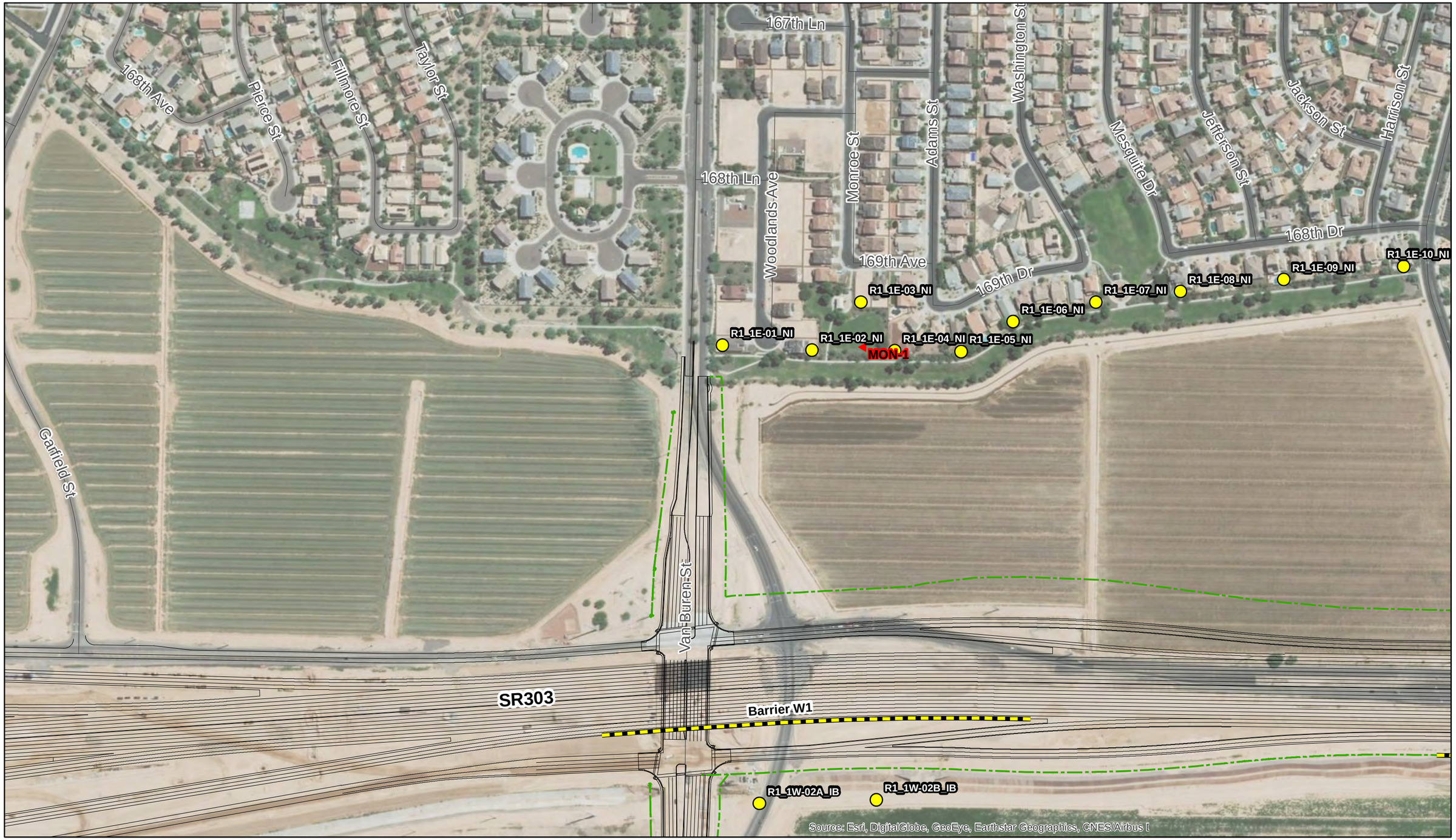
LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

SR 303 Widening Project– ALT 2C



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

SR 303 Widening Project– ALT 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

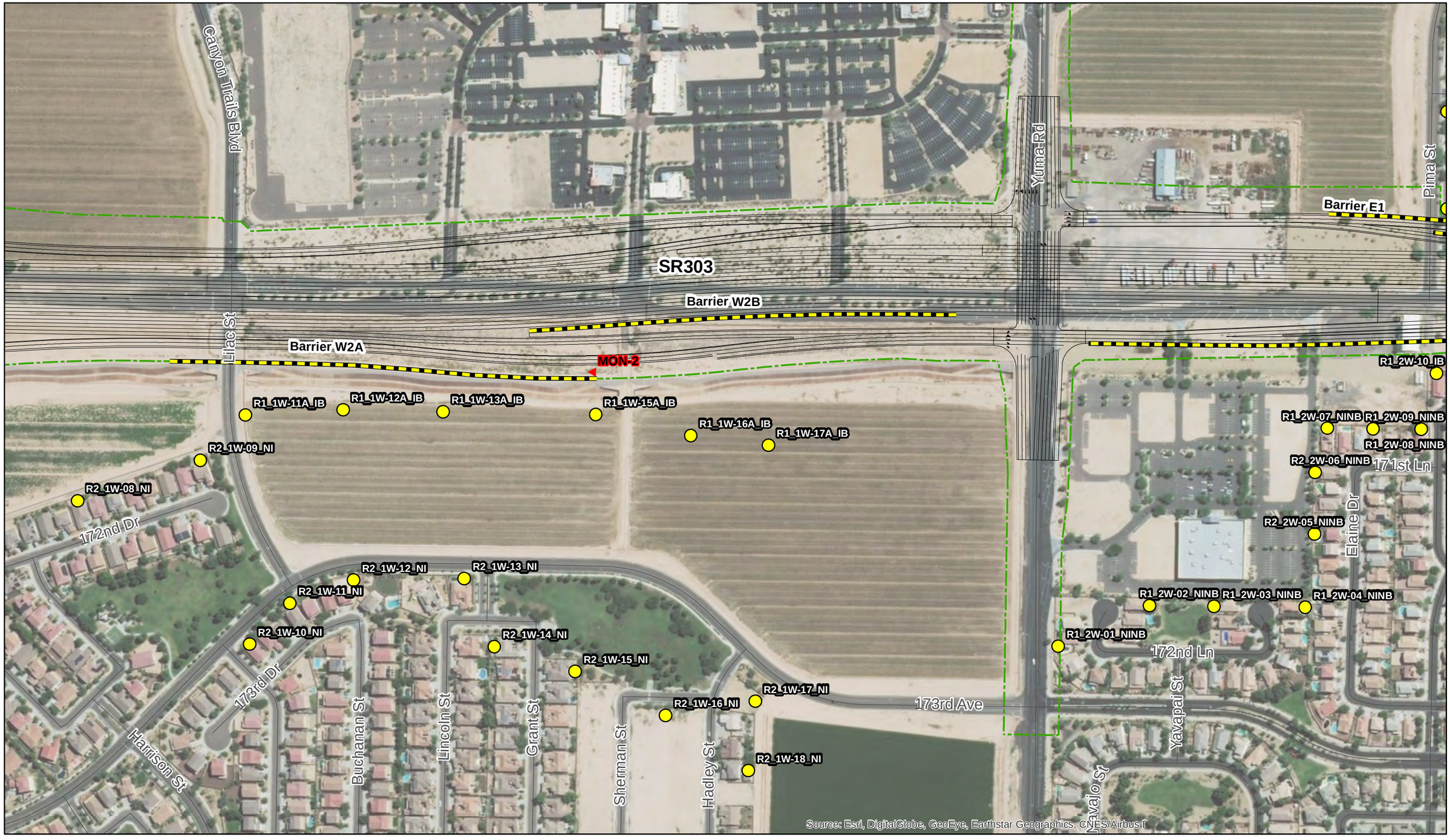
LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

SR 303 Widening Project– ALT 2C



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

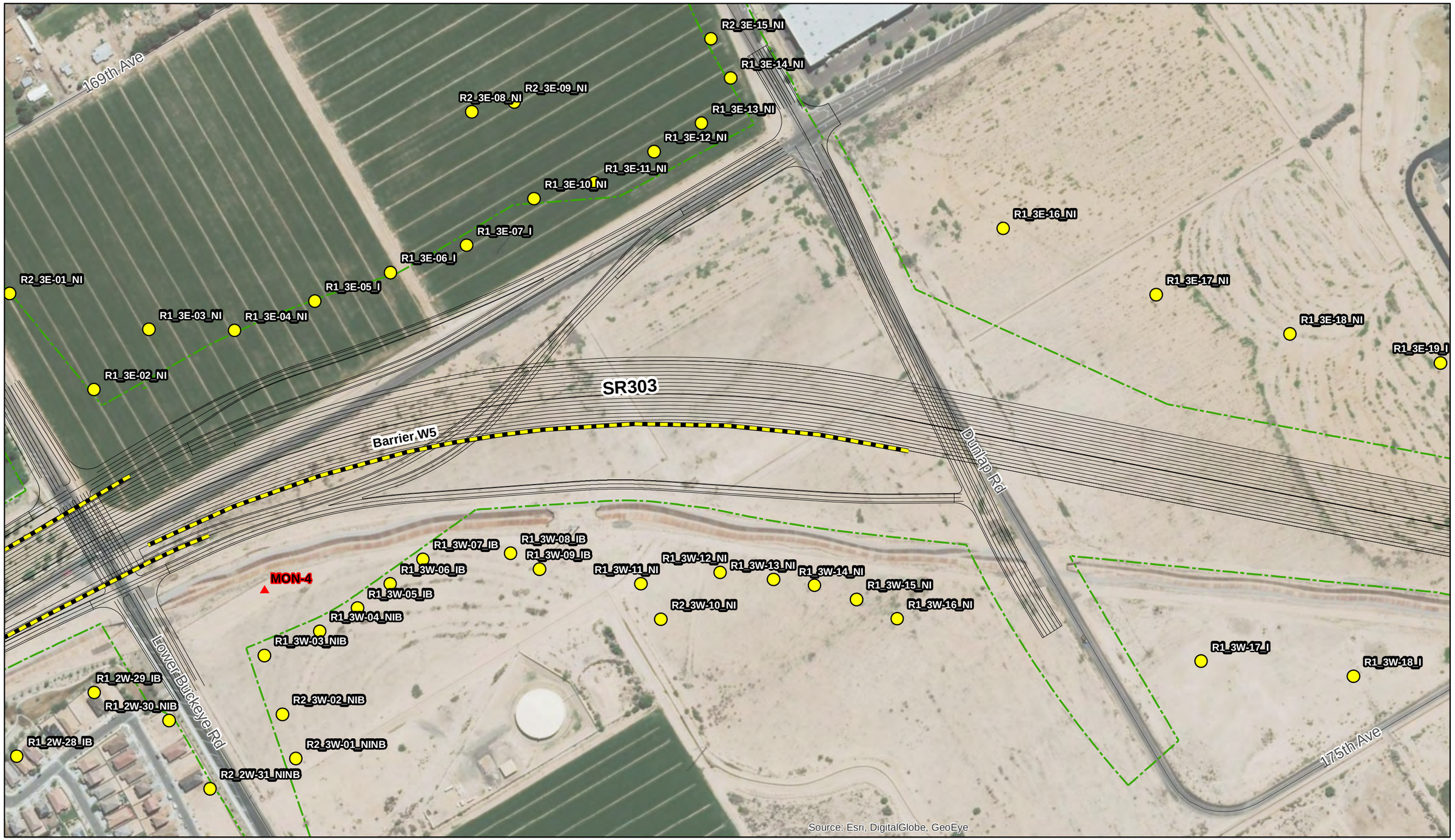
- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

5 of 15

SR 303 Widening Project– ALT 2C



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

SR 303 Widening Project– ALT 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

7 of 15

SR 303 Widening Project– ALT 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

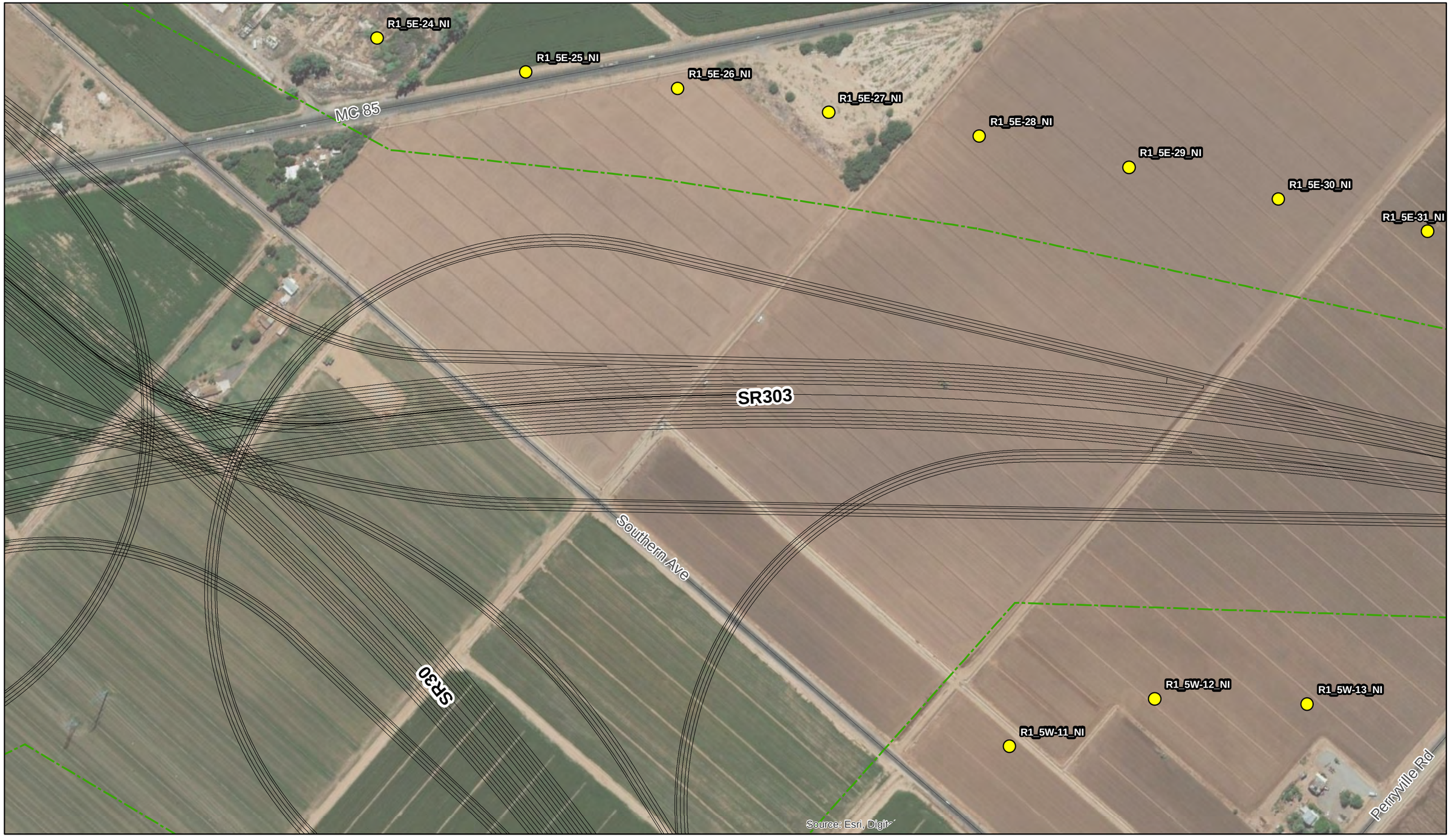
- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

8 of 15

SR 303 Widening Project– ALT 2C



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

9 of 15

SR 303 Widening Project– ALT 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

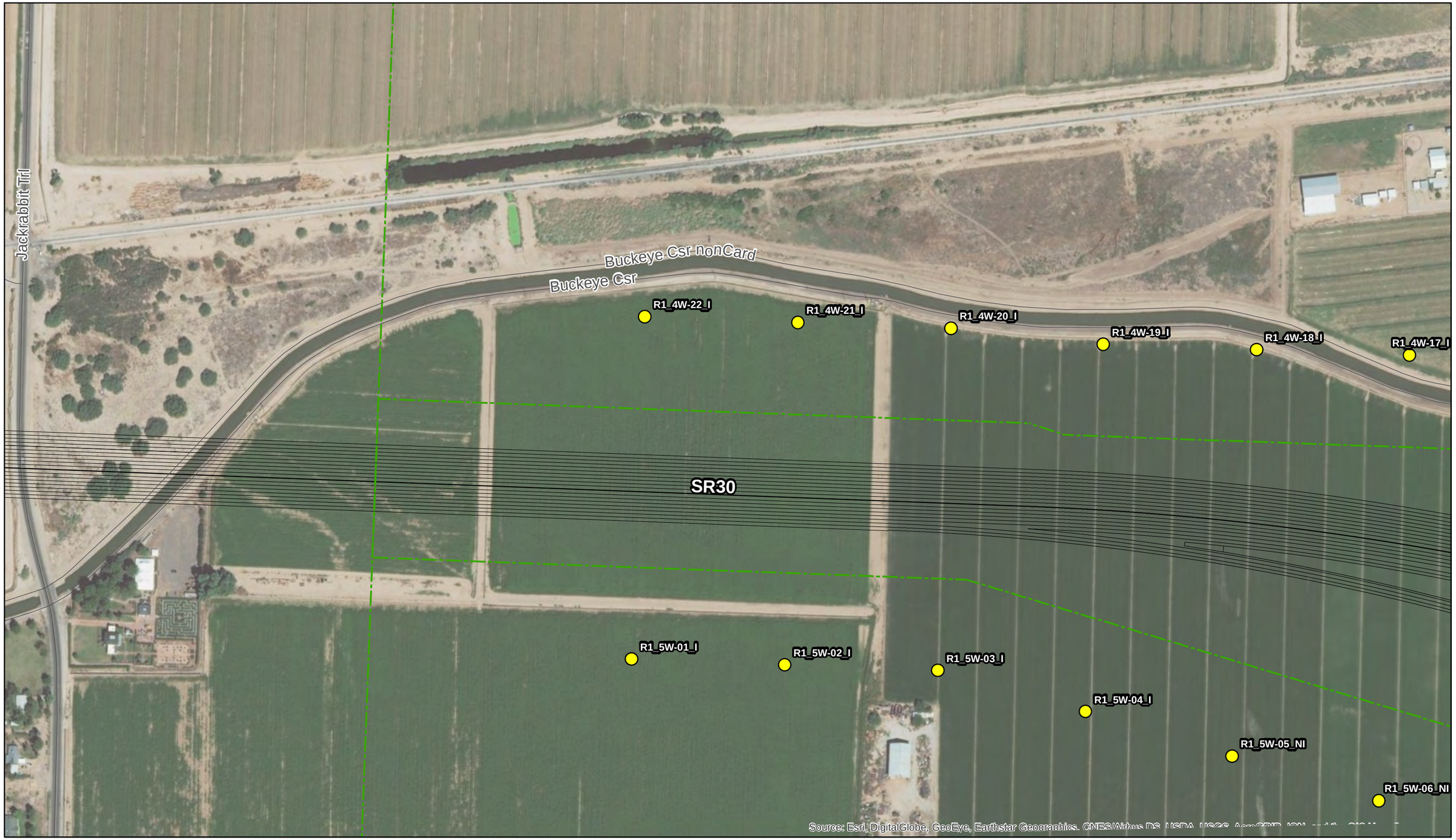
- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

10 of 15

SR 303 Widening Project– ALT 2C



N

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

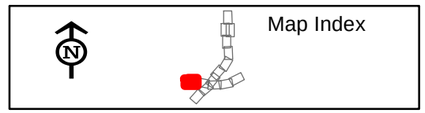
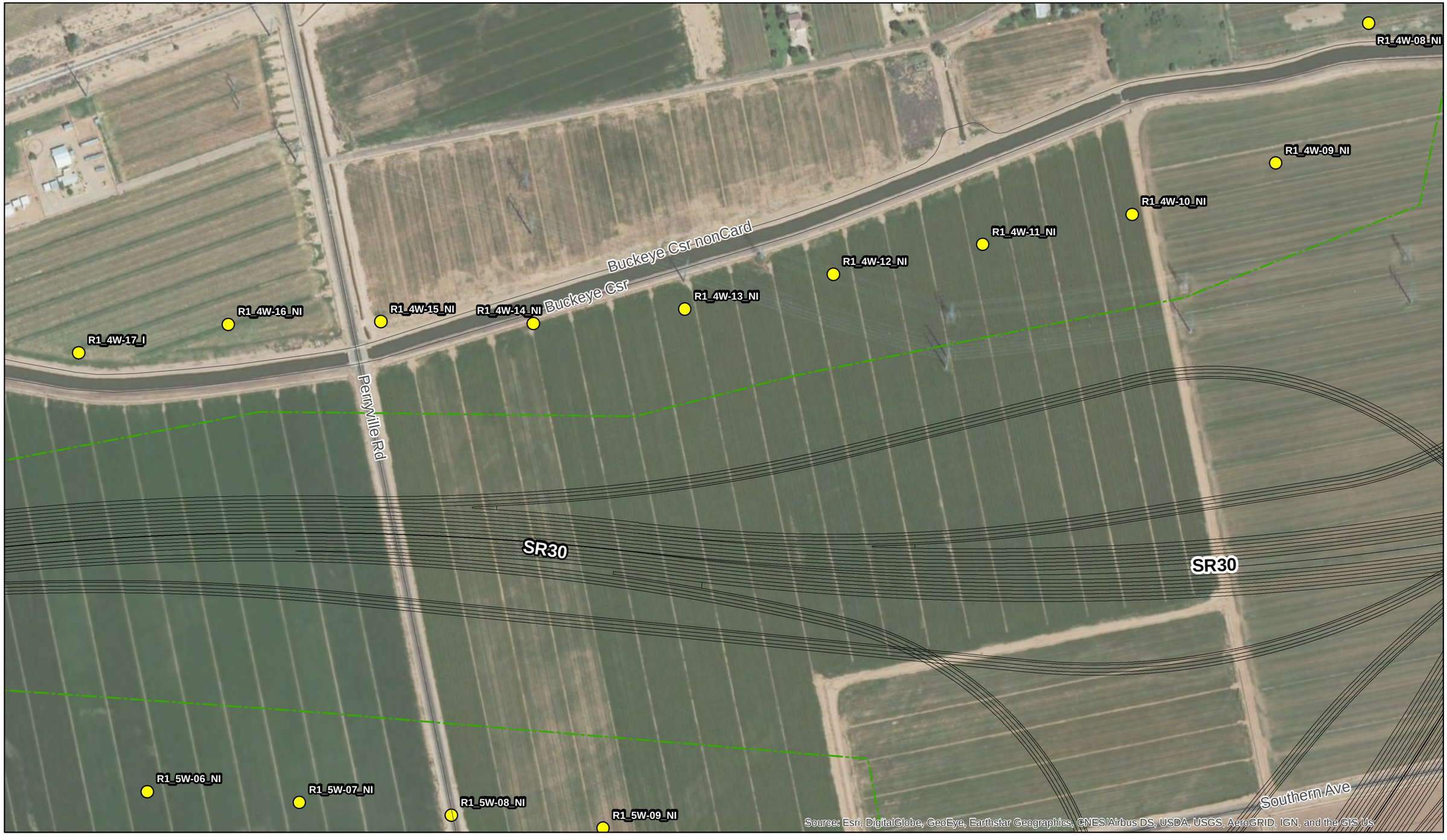


Figure Alt 2C

SR 303 Widening Project– ALT 2C



0 150 300
FEET

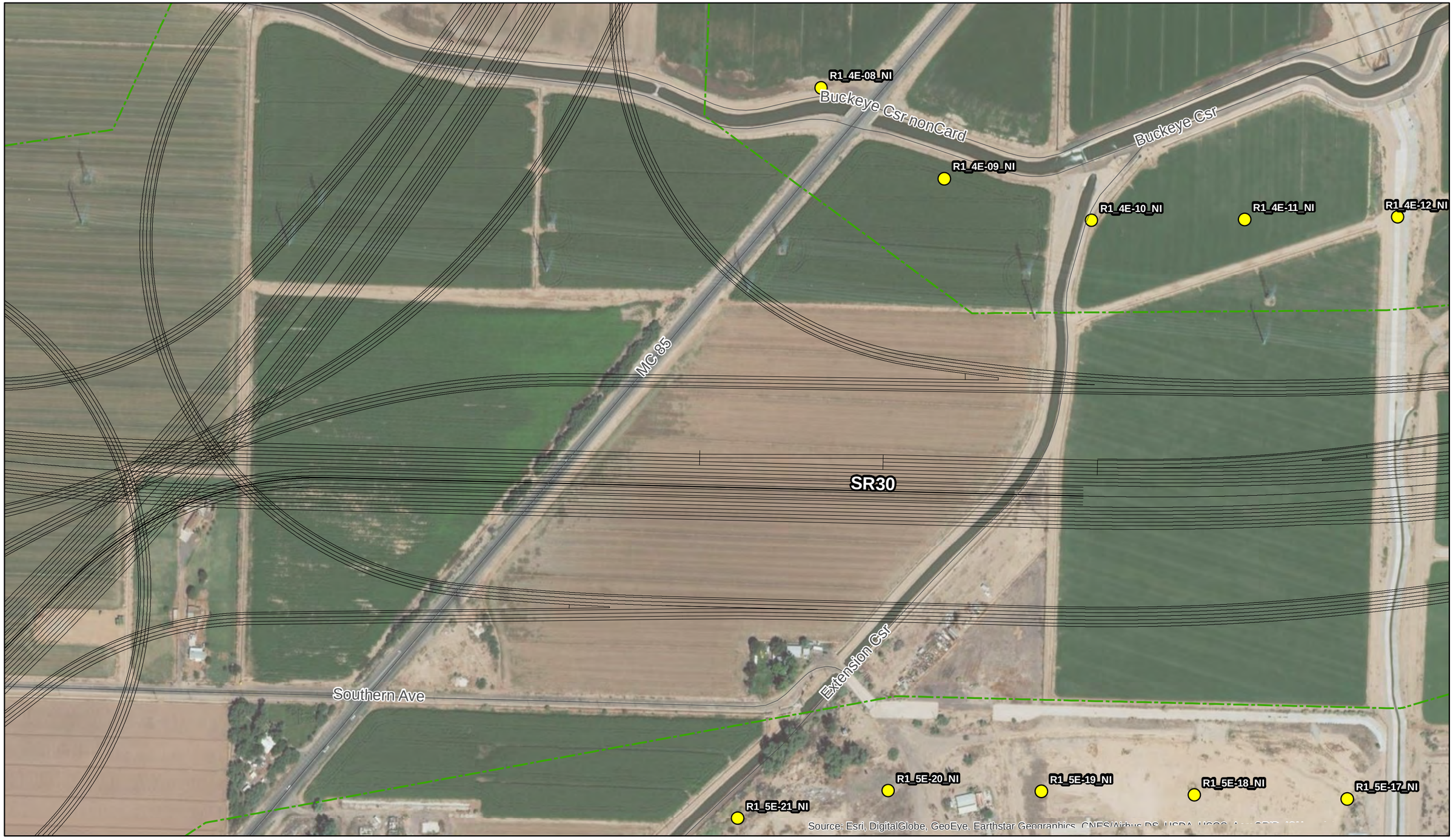
Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 2C



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

SR 303 Widening Project– ALT 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

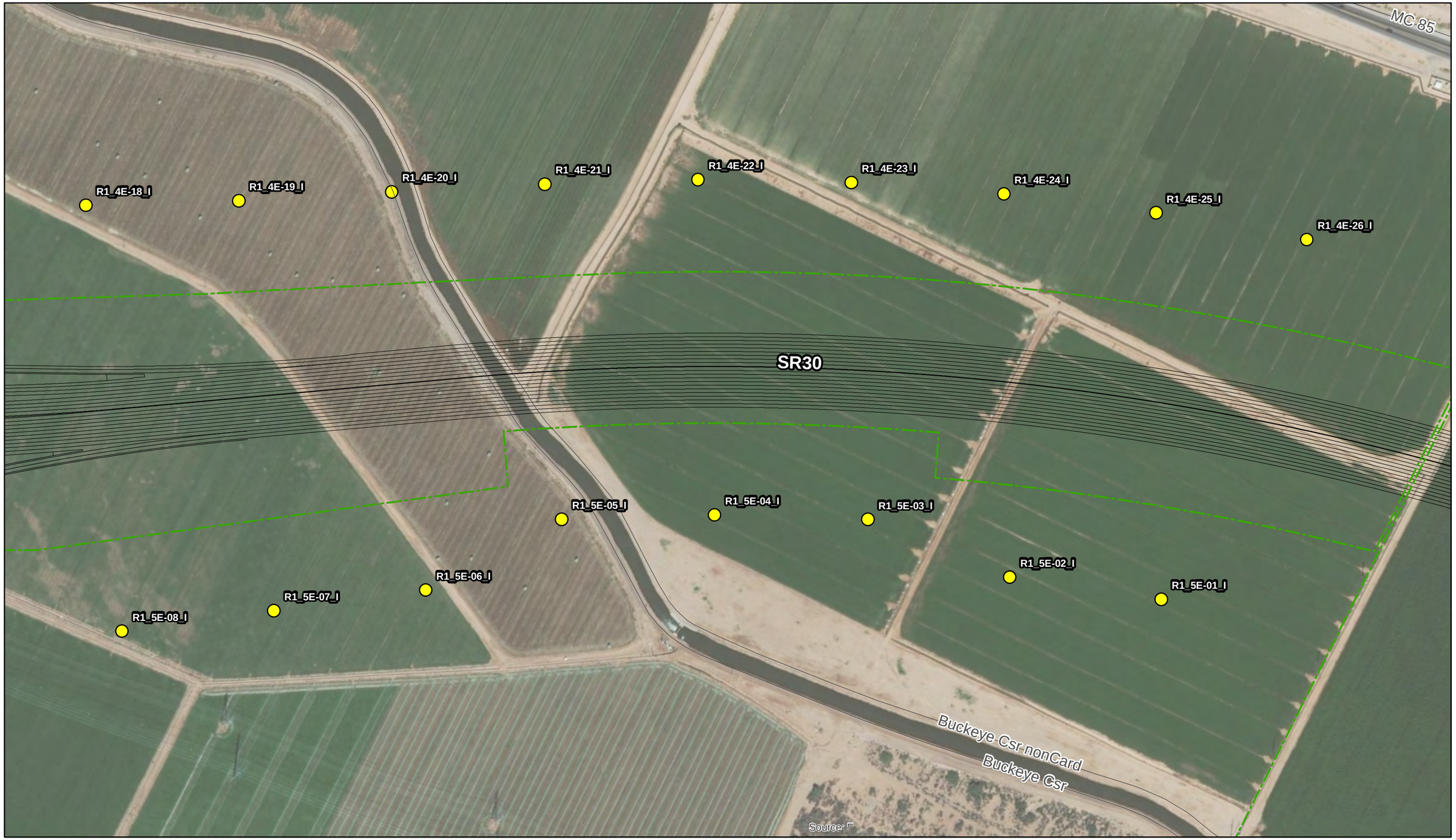
LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

SR 303 Widening Project– ALT 2C



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 2C Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 2C

15 of 15

SR 303 Widening Project– ALT 2C

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

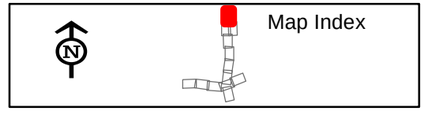


Figure Alt 3

1 of 13

SR 303 Widening Project– ALT 3

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 3

0 150 300
FEET

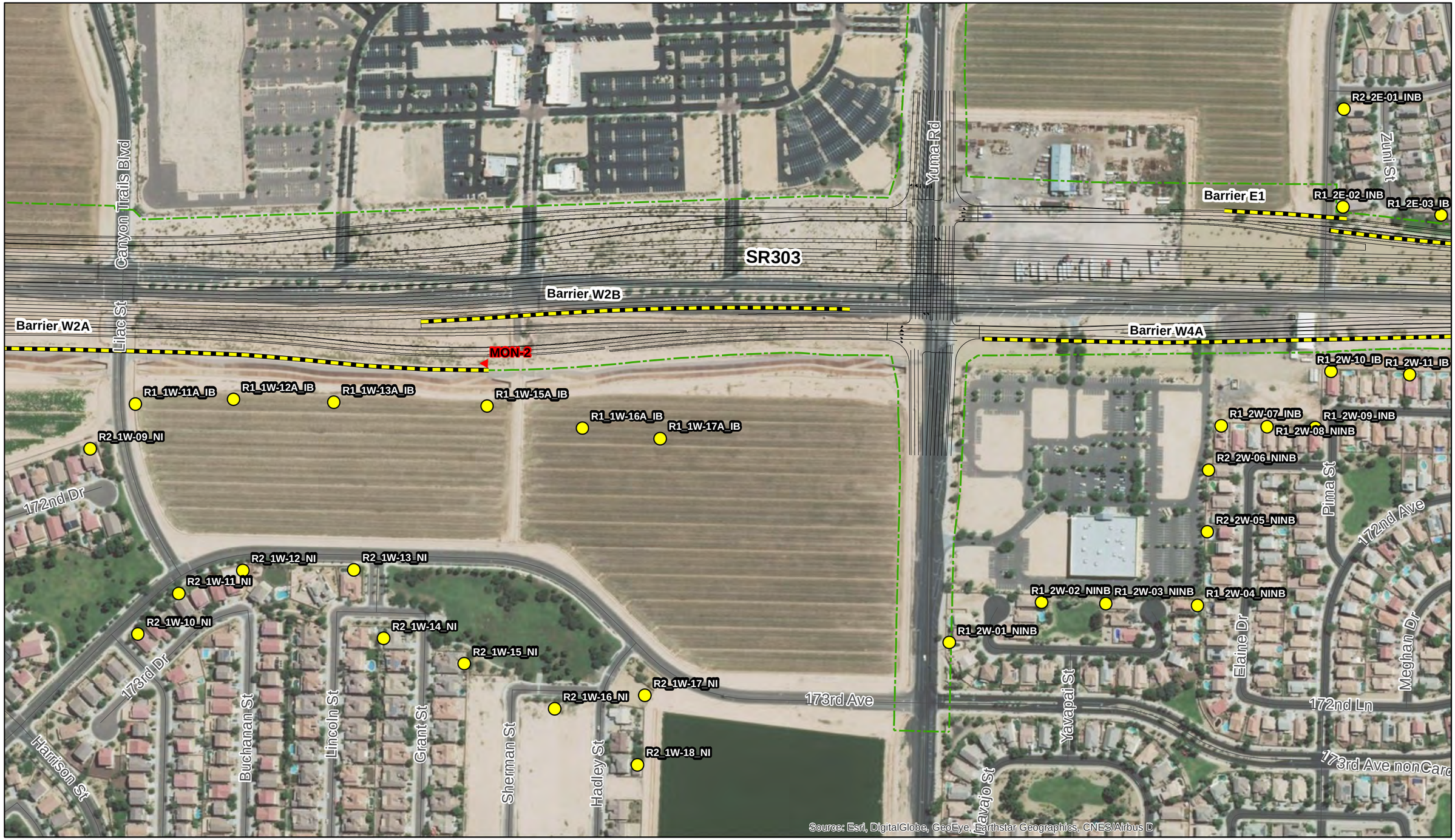
Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 3



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 3

SR 303 Widening Project– ALT 3

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

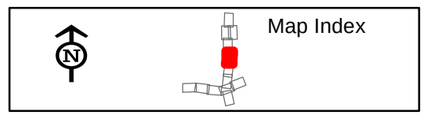
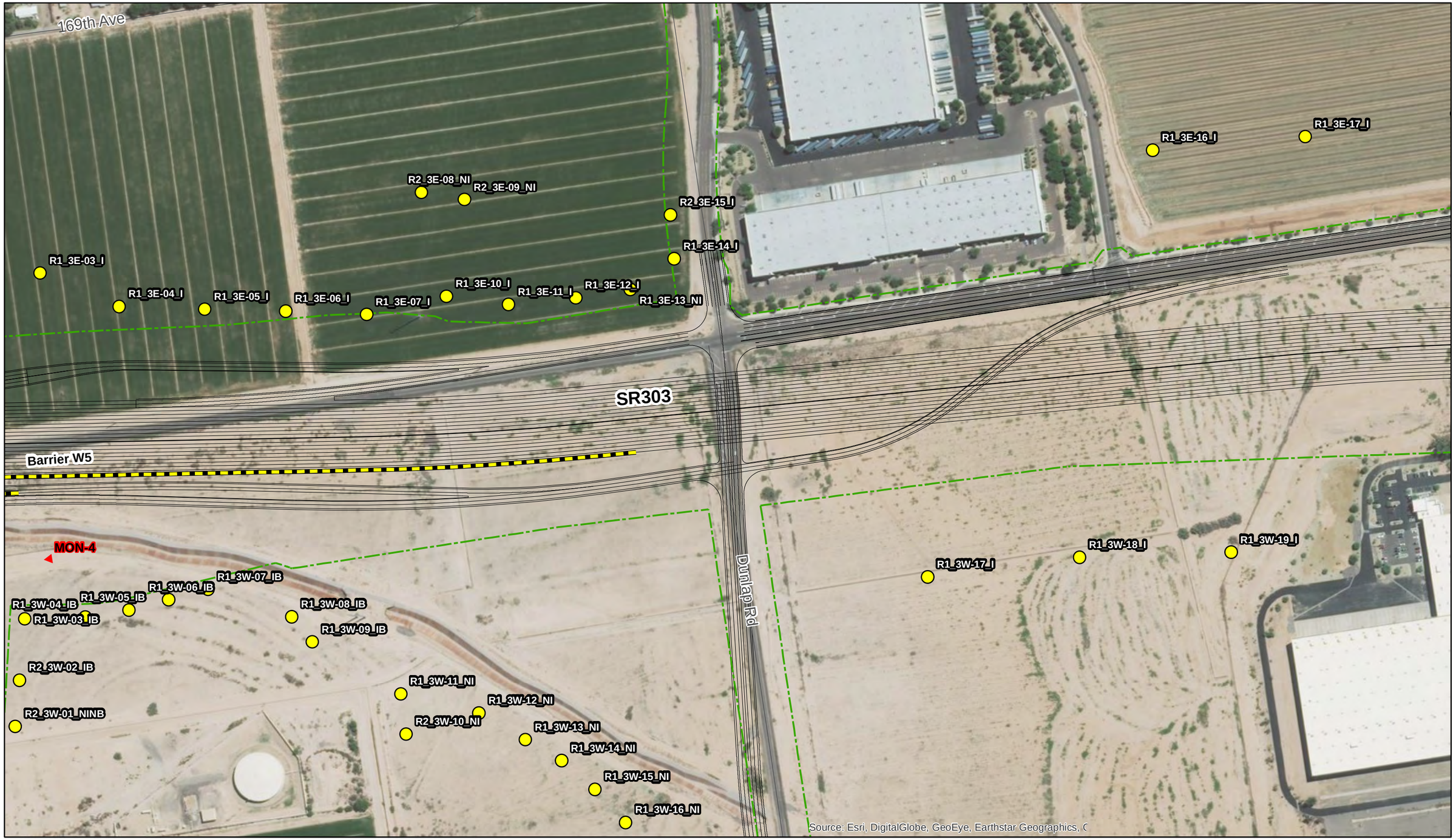


Figure Alt 3



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 3

SR 303 Widening Project– ALT 3

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

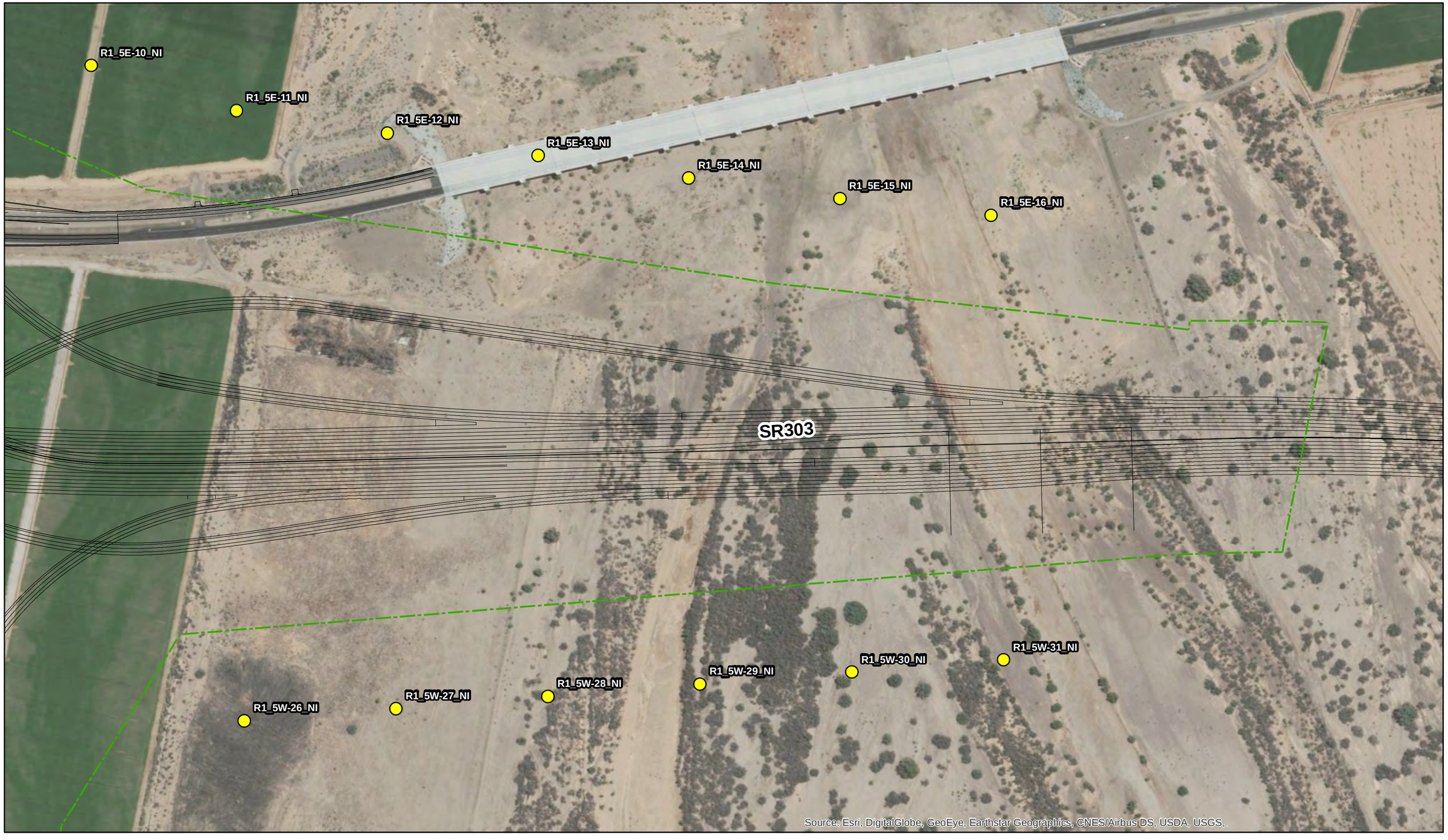
- Alt 3 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 3

7 of 13

SR 303 Widening Project– ALT 3



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 3

8 of 13

SR 303 Widening Project– ALT 3

N

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

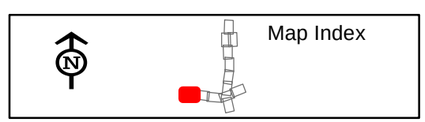


Figure Alt 3

N

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

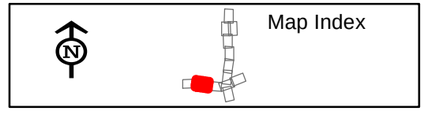


Figure Alt 3

N

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

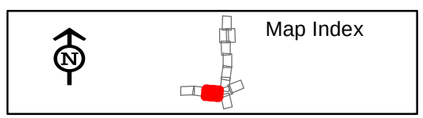


Figure Alt 3

N

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 3 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

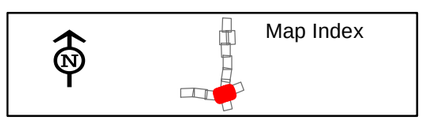
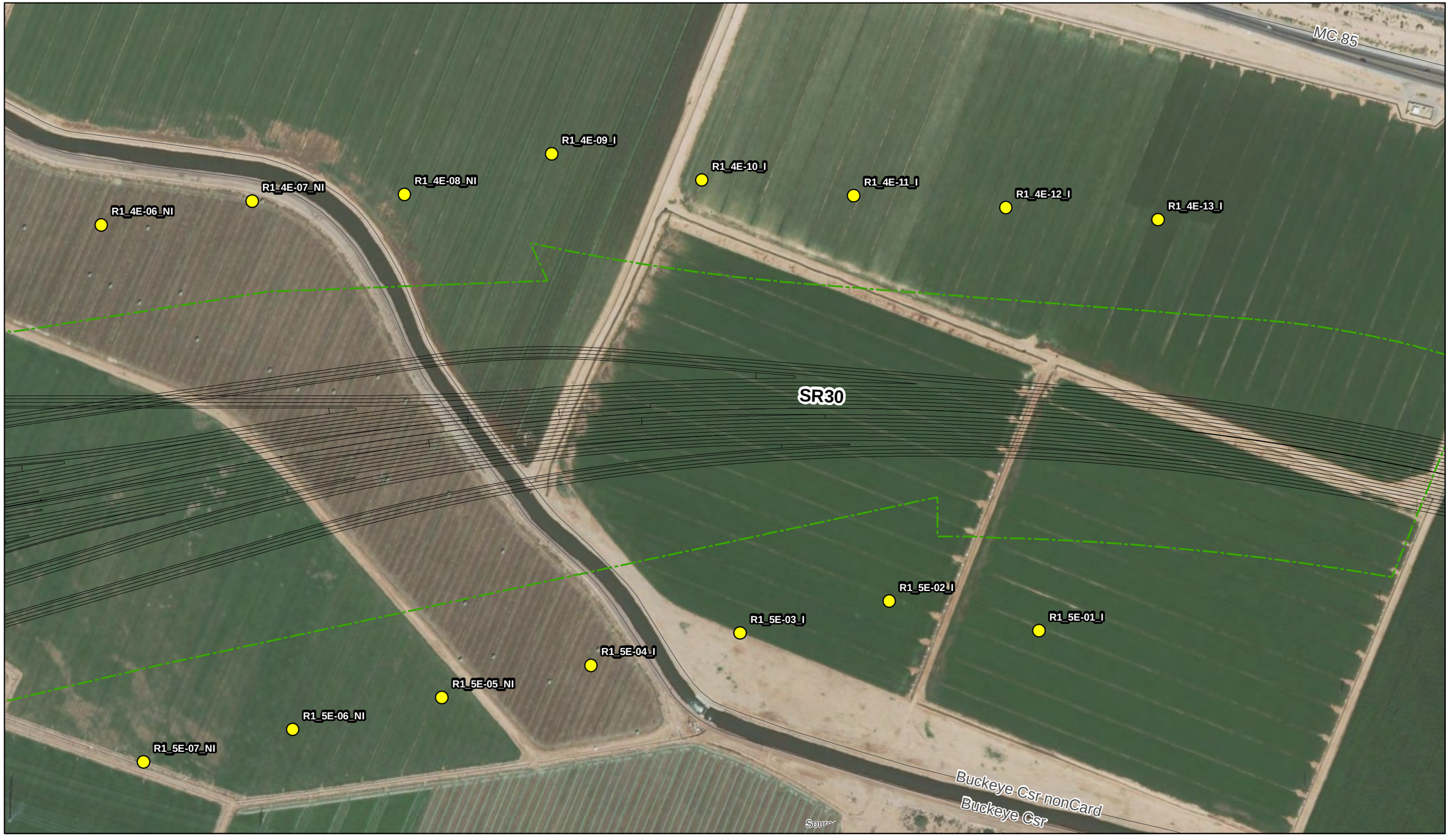


Figure Alt 3

12 of 13

SR 303 Widening Project– ALT 3



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

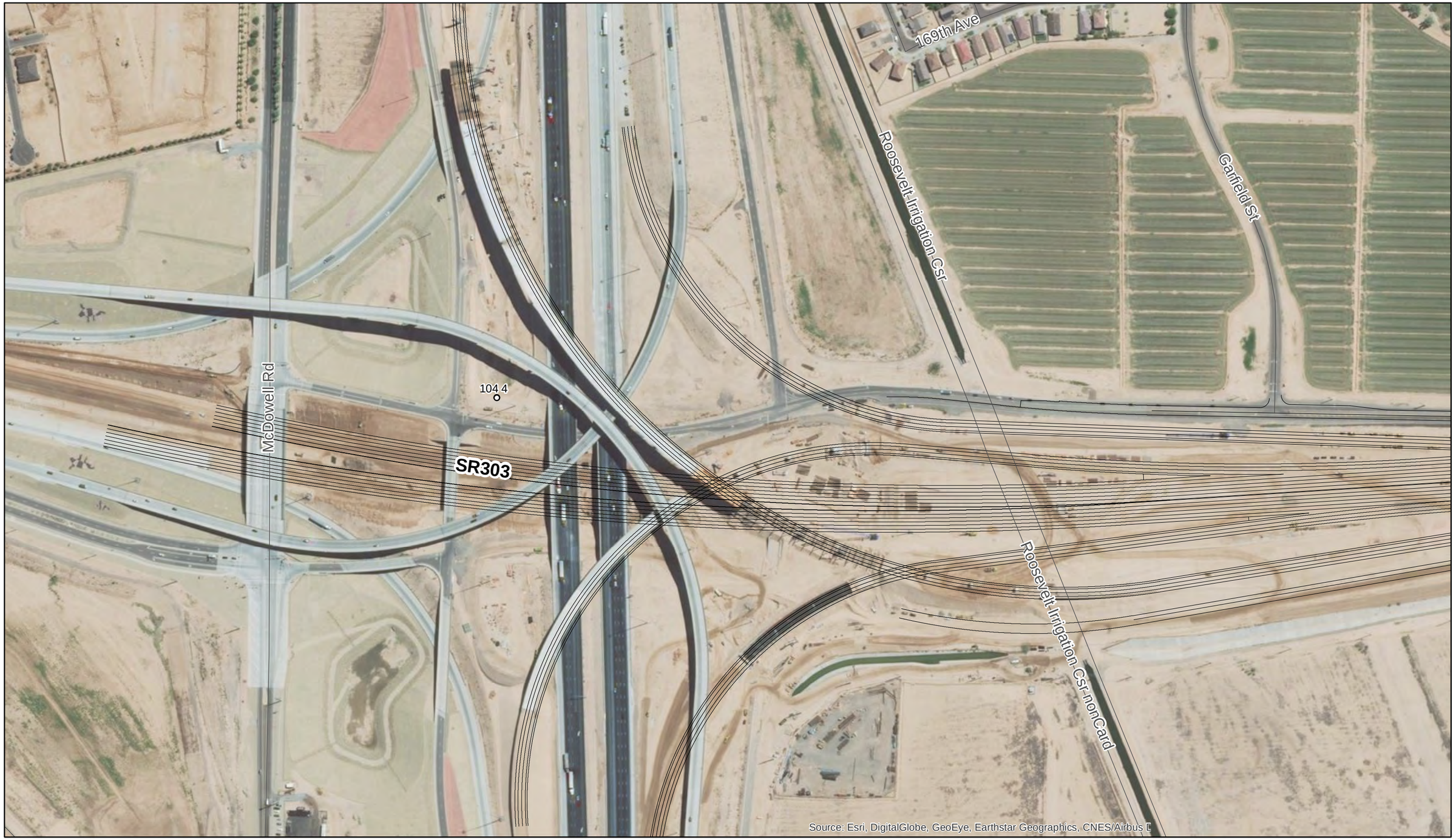
- Alt 3 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 3

13 of 13

SR 303 Widening Project– ALT 3



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

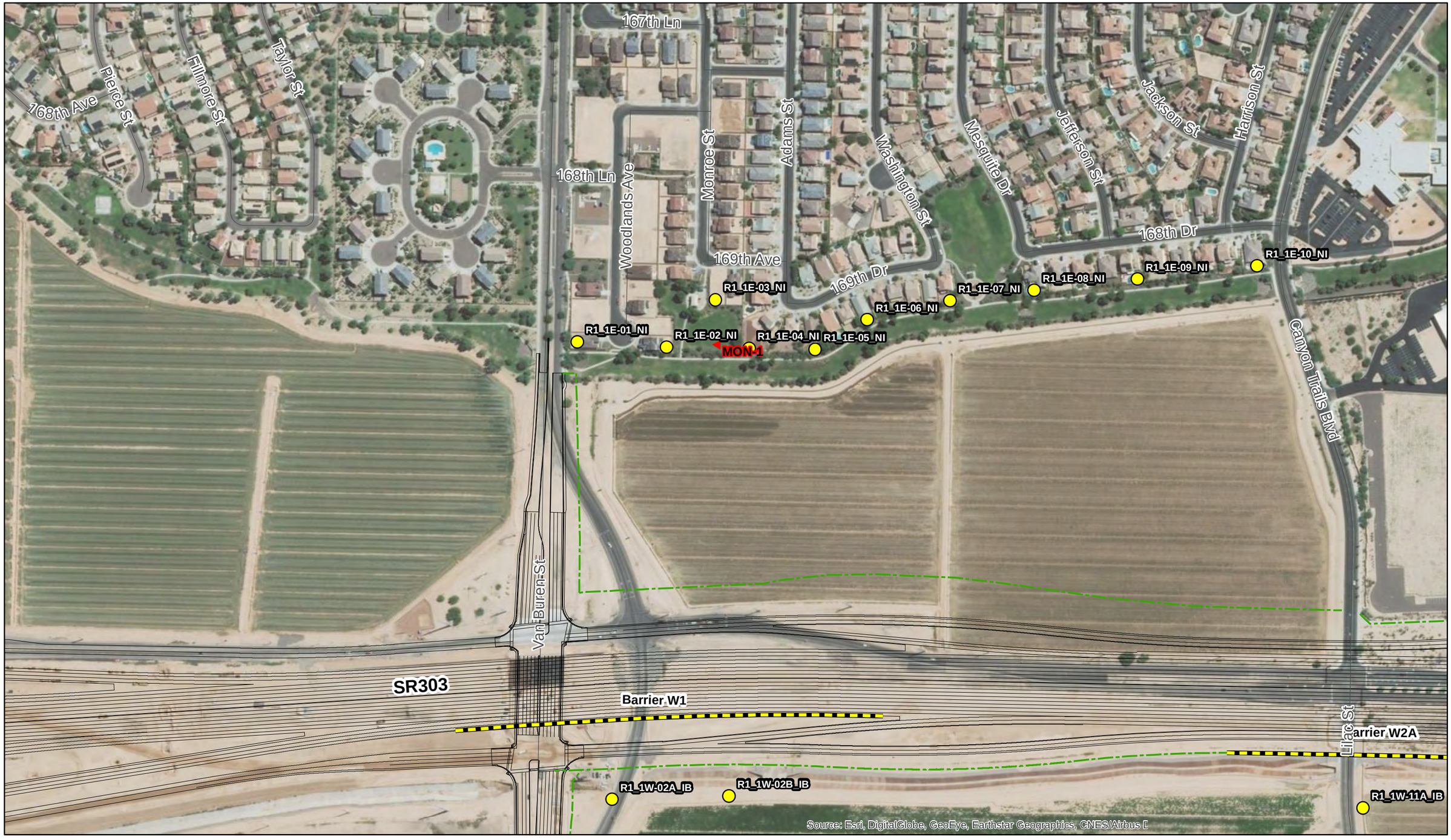
- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

1 of 16

SR 303 Widening Project– ALT 5



0 150 300
FEET

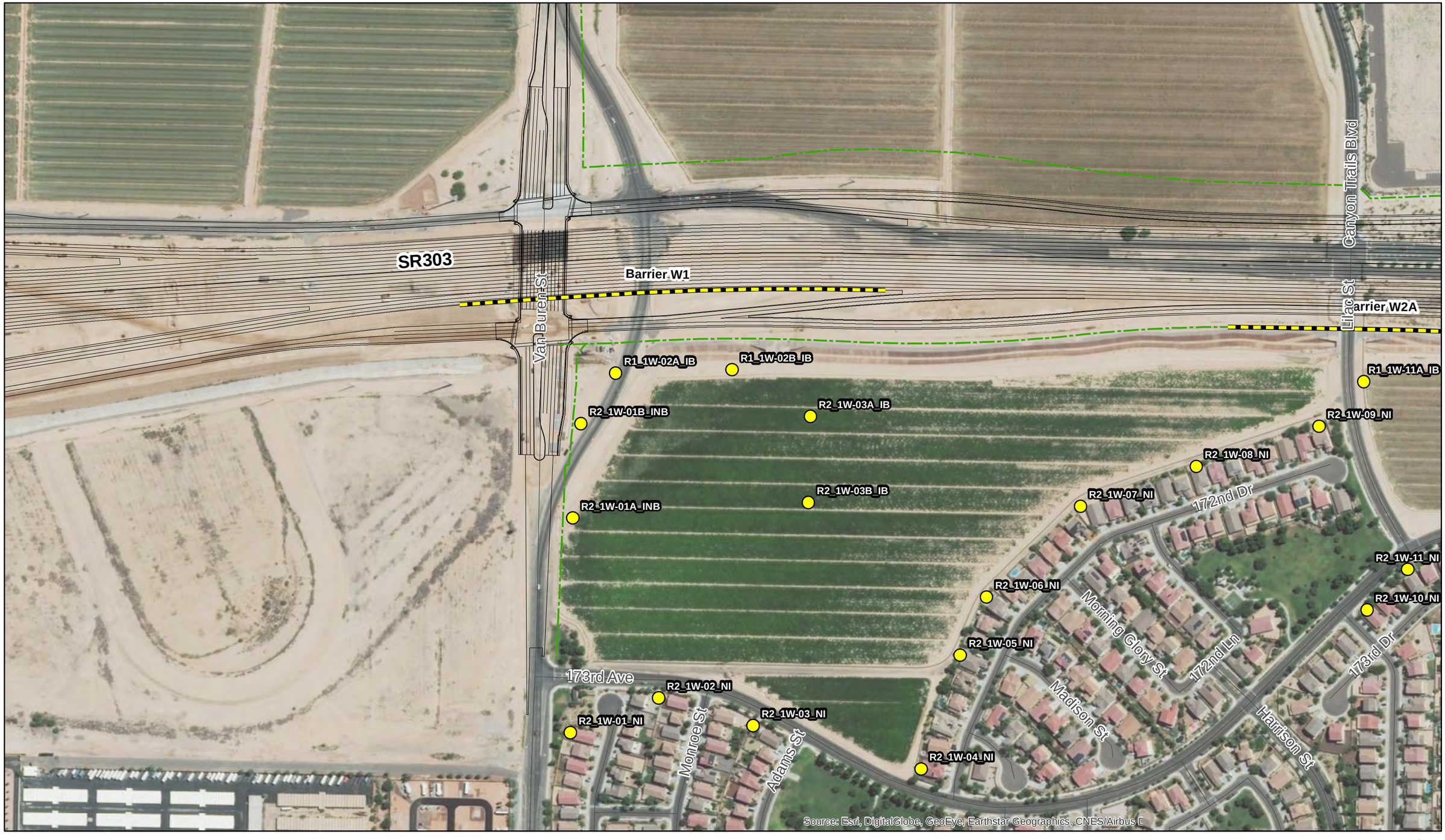
Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5



0 150 300
FEET

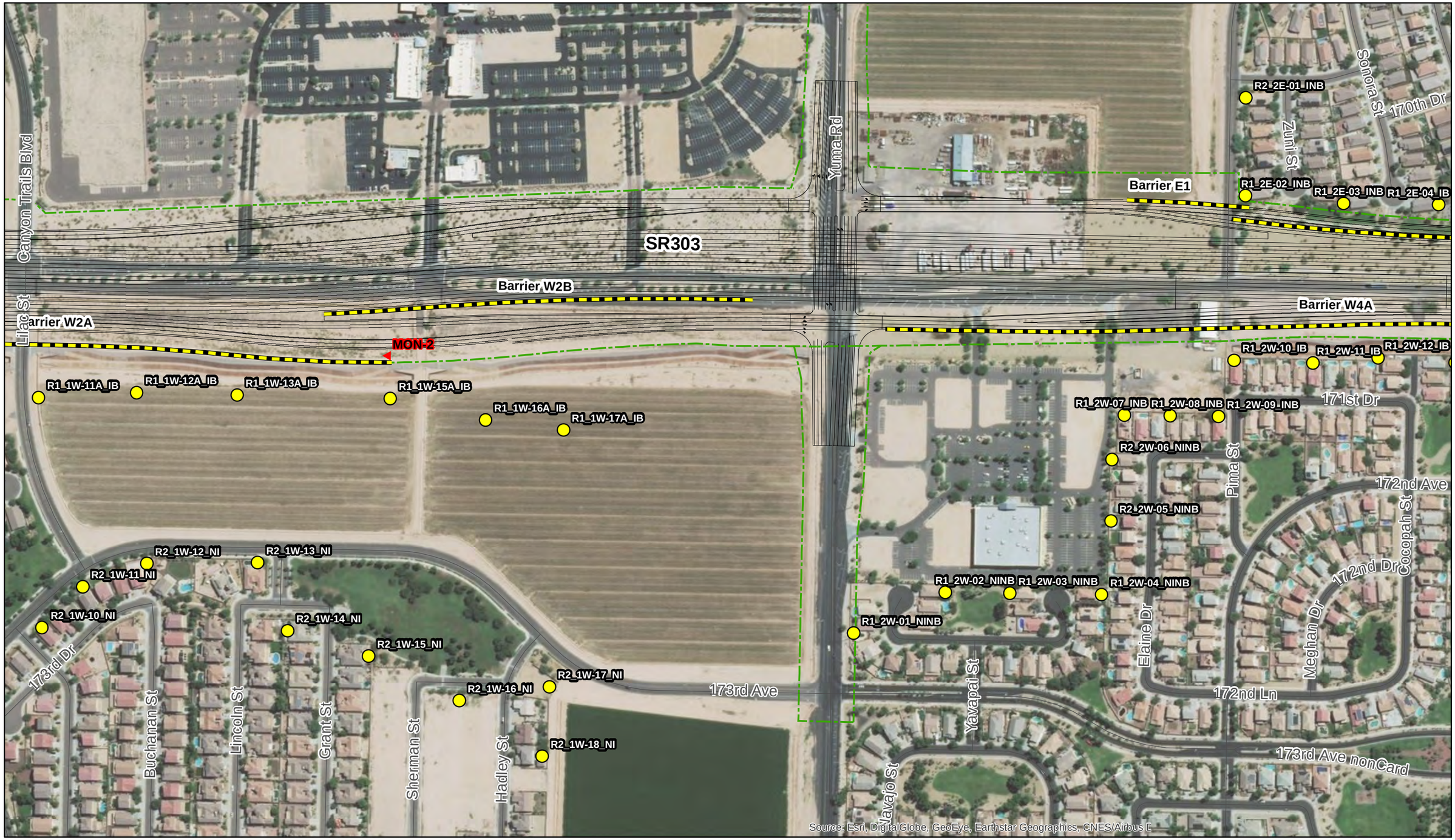
Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

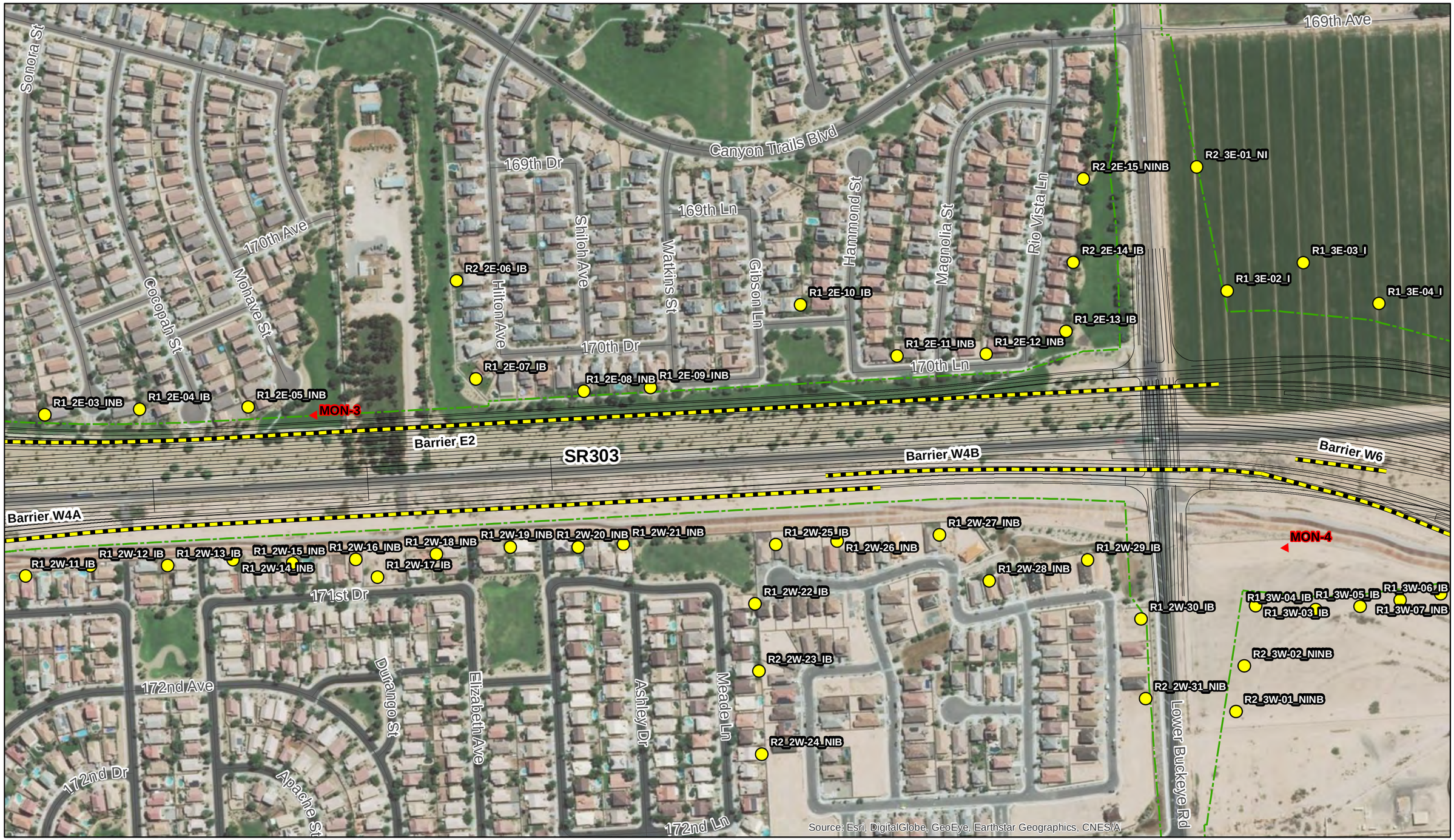
- Alt 5 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 5

4 of 16

SR 303 Widening Project– ALT 5



0 150 300
FEET

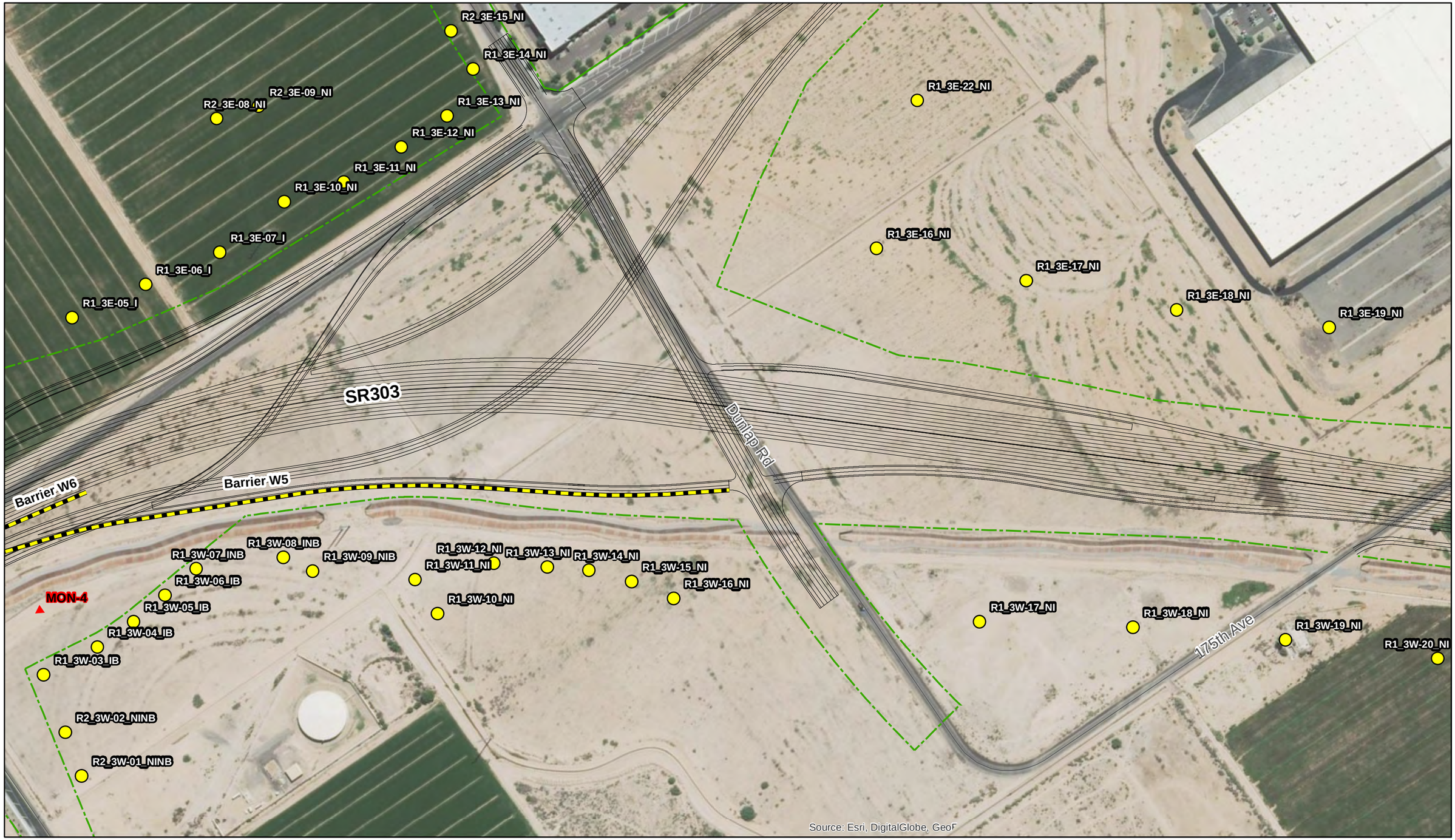
Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

N

0 150 300
FEET

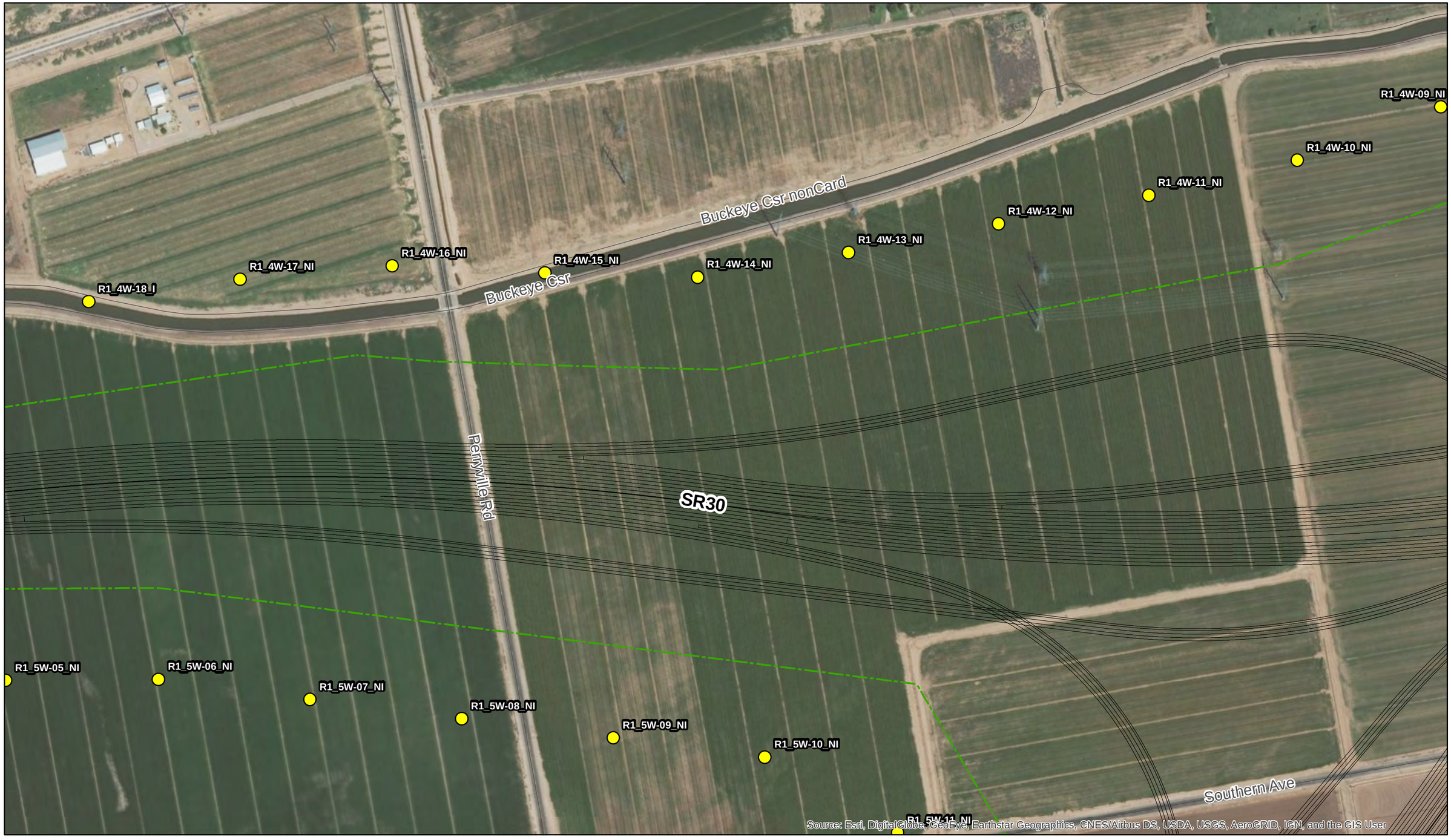
Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

Map Index

Figure Alt 5



0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

N

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

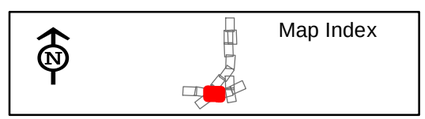


Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Potentially Recommended Barriers
- New R/W
- Noise Receivers
- Monitoring Locations

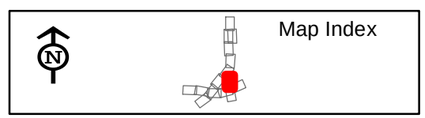


Figure Alt 5

0 150 300
FEET

Revised: 2/26/2018
SOURCE: World Imagery; WSP (2018)

LEGEND

- Alt 5 Alignment
- Noise Receivers
- Potentially Recommended Barriers
- Monitoring Locations
- New R/W

Map Index

Figure Alt 5

16 of 16

SR 303 Widening Project– ALT 5

APPENDIX B – NOISE MEASUREMENT DATA

newton
Environmental Consulting, LLC

Traffic Counting Log

1	Date	Sky	Temp °F	Humidity %	Wind Speed/Dir	Project	Day Of Week	Staff	Meter	Batt Check	Calibraton	# Traffic Lanes	Receptor Above, Below Or Same Elevation As Roadway
	10/11/17	Partly Cloudy	69	32	N 7 Mph	SR 303	Wednesday	MO/Andrea	Larson Davis LXT	Yes	Yes		

Receiver 1 33° 26' 57" N - 112° 25' 29" W	Sample	Axis	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles	Total	Start Time	End Time	Duration	LaEQ	LaMin	LaMax
	1	Van Buren E-W	38	2	0	0	0	**40**	7:50:00	8:05:15	0:15:15	53.8	47.9	71.3
	1	Van Buren W-E	25	2	0	0	0	**27**						
	1	Cotton Ln N-S	63	2	5	0	0	**70**						
	1	Cotton Ln S-N	80	3	2	0	0	**85**						
	2	Van Buren E-W	16	1	0	0	0	**17**	8:16:00	9:01:03	0:15:03	50.6	44	66.5
	2	Van Buren W-E	22	2	0	0	0	**24**						
	2	Cotton Ln N-S	57	3	1	0	0	**61**						
	2	Cotton Ln S-N	88	1	2	0	0	**91**						
	3	Van Buren E-W	17	2	0	0	0	**19**	8:34:00	8:49:03	0:15:03	50.3	44.2	59.7
	3	Van Buren W-E	19	3	0	0	0	**22**						
	3	Cotton Ln N-S	68	5	4	0	3	**80**						
	3	Cotton Ln S-N	78	2	5	0	0	**85**						
	Total		**571**	**28**	**19**	**0**	**3**	**621**						

2	Date	Sky	Temp °F	Humidity %	Wind Speed/Dir	Project	Day Of Week	Staff	Meter	Batt Check	Calibraton	# Traffic Lanes	Receptor Above, Below Or Same Elevation As Roadway
	10/11/2017	Partly Cloudy	**80 °F**	**31%**	NE 8 Mph	SR 303	Wednesday	MO/Andrea	Larson Davis LXT	Yes	Yes		

Receiver 2 33° 26' 22" N - 112° 25" 38" W	Sample	Axis	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles	Total	Start Time	End Time	Duration	LaEQ	LaMin	LaMax
	1	Cotton Ln N-S	64	0	2	0	0	**66**	9:26:00	9:41:00	0:15:07	57	42	68.9
	1	Cotton Lane S-N	71	5	2	0	0	**78**						
	2	Cotton Ln N-S	50	1	3	0	0	**54**	9:44:00	9:59:00	0:15:03	57.5	42.8	73.4
	2	Cotton Lane S-N	65	2	5	0	0	**72**						
	3	Cotton Ln N-S	55	3	3	0	0	**61**	10:00:00	10:15:00	0:15:05	56.9	43.7	69.2
	3	Cotton Lane S-N	63	1	5	0	1	**70**						
	Total		**368**	**12**	**20**	**0**	**1**	**401**						

3	Date	Sky	Temp °F	Humidity %	Wind Speed/Dir	Project	Day Of Week	Staff	Meter	Batt Check	Calibraton	# Traffic Lanes	Receptor Above, Below Or Same Elevation As Roadway
	10/11/2017	Partly Cloudy	**80 °F**	**31%**	NE 8 Mph	SR 303	Wednesday	MO/Andrea	Larson Davis LXT	Yes	Yes		

Receiver 3 33° 25' 44" N - 112° 25" 36" W	Sample	Axis	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles	Total	Start Time	End Time	Duration	LaEQ	LaMin	LaMax
		Cotton Ln N-S	28	2	5	0	0	**35**	10:55:10	11:10:28	0:15:18	68	36.5	86.6
		Cotton Lane S-N	39	3	3	0	0	**45**						
		Cotton Ln N-S	39	3	3	0	0	**45**	11:11:00	11:26:16	0:15:16	50.2	48.8	53.4
		Cotton Lane S-N	39	2	1	0	0	**42**						
		Cotton Ln N-S	43	5	2	0	0	**50**	11:28:00	11:43:07	0:15:07	67.2	36.7	82
		Cotton Lane S-N	37	1	1	0	0	**39**						
	Total		**225**	**16**	**15**	**0**	**0**	**256**						

Traffic Counting Log

4	Date	Sky	Temp °F	Humidity %	Wind Speed/Dir	Project	Day Of Week	Staff	Meter	Batt Check	Calibraton	# Traffic Lanes	Receptor Above, Below Or Same Elevation As Roadway
	10/11/2017	Partly Cloudy	80 °F	31%	NE 8 Mph	SR 303	Wednesday	MO/Andrea	Larson Davis LXT	Yes	Yes		

Receiver 4 33° 25' 13" N - 112° 25" 41" W	Sample	Axis	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles	Total	Start Time	End Time	Duration	LaEQ	LaMin	LaMax
	1	Cotton Ln N-S	43	1	2	0	0	**46**	13:37:00	13:52:01	0:15:01	45.9	34.7	60.8
	1	Cotton Lane S-N	42	4	1	0	0	**47**						
	1	Lower Buckeye E-W	8	0	0	0	0	**8**						
	1	Lower Buckeye W-E	0	0	0	0	0	**0**						
	2	Cotton Ln N-S	52	4	3	0	0	**59**	13:54:00	14:09:02	0:15:02	47	61.7	34.2
	2	Cotton Lane S-N	39	0	4	0	0	**43**						
	2	Lower Buckeye E-W	5	0	0	0	0	**5**						
	2	Lower Buckeye W-E	7	0	0	0	0	**7**						
	3	Cotton Ln N-S	51	6	0	0	0	**57**	14:11:00	14:26:02	0:15:02	46.3	36.2	69.1
	3	Cotton Lane S-N	30	9	2	0	0	**41**						
	3	Lower Buckeye E-W	11	0	0	0	0	**11**						
	3	Lower Buckeye W-E	3	0	0	0	0	**3**						
	Total		291	24	12	0	0	327						

5	Date	Sky	Temp °F	Humidity %	Wind Speed/Dir	Project	Day Of Week	Staff	Meter	Batt Check	Calibraton	# Traffic Lanes	Receptor Above, Below Or Same Elevation As Roadway
	10/11/2017	Partly Cloudy	96 °F	14%	SW 8 Mph	SR 303	Wednesday	MO/Andrea	Larson Davis LXT	Yes	Yes		

Receiver 5 33° 24' 24" N - 112° 26" 42" W	Sample	Axis	Autos	Medium Trucks	Heavy Trucks	Buses	Motorcycles	Total	Start Time	End Time	Duration	LaEQ	LaMin	LaMax
	1	Broadway Rd & 179th Dr E-W	5	0	1	0	0	**6**	14:59:00	15:14:01	0:15:01	50.1	32.1	72.9
	1	Broadway Rd & 179th Dr W-E	0	0	0	0	0	**0**						
	2	Broadway Rd & 179th Dr E-W	5	0	0	0	0	**5**	15:15:00	15:30:04	0:15:04	48.4	32.9	73.2
	2	Broadway Rd & 179th Dr W-E	4	0	0	0	0	**4**						
	3	Broadway Rd & 179th Dr E-W	5	0	0	0	0	**5**	15:31:00	15:46:02	0:15:02	48.2	70.6	32.4
	3	Broadway Rd & 179th Dr W-E	4	0	0	0	0	**4**						
	Total		23	0	1	0	0	24						

APPENDIX C – TNM 2.5 TRAFFIC VOLUMES

Alternative 2C Traffic Volumes

SB Roadway Segment	June Traffic Volumes				Percent Difference	October Traffic Volumes			
	Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck		Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck
SR303L I-10 to Van Buren St	4250	90	4	6	+1.2%	4301	90	4	6
SR303L Ramp South of Van Buren	340	98	1	1	+1.5%	346	98	1	1
SR303L Van Buren St to Yuma Rd	4590	91	4	5	+1.5%	4659	91	4	5
SR303L Ramp North of Yuma Rd	1470	98	1	1	+1.5%	1493	98	1	1
SR303L over Yuma Rd	3120	88	4	8	+3.0%	3214	88	4	8
SR303L Ramp South of Yuma	280	98	1	1	+5.1%	295	98	1	1
SR303L Elizabeth Ave to Lower Buckeye	3400	88	4	8	+5.1%	3574	88	4	8
SR303L Lower Buckeye to Elwood	2060	83	6	11	+5.1%	2166	83	6	11
SR303L Ramp North of Elwood	1340	97	2	1	+5.1%	1409	97	2	1
SR303L Ramp South of Lower Buckeye	230	99	1	0	+5.1%	242	99	1	0
SR303L/SR30 S-E Ramp	810	64	9	27	-13.5%	701	64	9	27
SR303L/SR30 S-W Ramp	1260	96	3	1	+57.4%	1984	96	3	1
SR303L/SR30 E-N Ramp	640	95	4	1	+5.8%	678	95	4	1
SR303L/SR30 W-N Ramp	830	69	7	24	+11.0%	922	69	7	24
SR30 WB - East of SR303L	3540	83	4	13	+0.7%	3565	83	4	13
SR30 EB - East of SR303L	1880	79	8	13	+0.7%	1894	79	8	13
SR30 EB - West of SR303L	2060	94	4	2	-12.3%	1807	94	4	2
SR30 WB - West of SR303L	4150	91	3	6	-12.3%	3640	91	3	6
SR30 EB - Over SR303L	1420	93	5	2	-28.9%	1010	93	5	2
SR30 WB - Over SR303L	2900	88	3	9	-16.9%	2410	88	3	9
SR30 WB - East of Cotton	4940	87	4	9	+0.7%	4975	87	4	9
SR30 EB - East of Cotton	2160	81	7	12	+0.7%	2176	81	7	12
Frontage Road - Van Buren to Lilac	200	98	1	1	+1.5%	203	98	1	1
Frontage Road - Lilac to Yuma	290	98	1	1	+1.5%	295	98	1	1
Frontage Road - Yuma to Lower Buckeye	320	99	1	0	+5.1%	337	99	1	0
Frontage Road - South of Lower Buckeye	90	99	1	0	+5.1%	95	99	1	0

NB Roadway Segment	June Traffic Volumes				Percent Difference	October Traffic Volumes			
	Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck		Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck
SR303L I-10 to Van Buren St	3220	87	5	8	+1.2%	3259	87	5	8
SR303L Ramp South of Van Buren	380	98	1	1	+1.5%	386	98	1	1
SR303L Van Buren St to Yuma Rd	3590	88	4	8	+1.5%	3644	88	4	8
SR303L Ramp North of Yuma Rd	980	97	2	1	+1.5%	995	97	2	1
SR303L over Yuma Rd	2610	85	5	10	+3.0%	2689	85	5	10
SR303L Ramp South of Yuma	180	98	1	1	+5.1%	190	98	1	1
SR303L Elizabeth Ave to Lower Buckeye	2790	85	5	10	+5.1%	2933	85	5	10
SR303L Lower Buckeye to Ramp North of Elwood	1480	80	6	14	+5.1%	1556	80	6	14
SR303L Ramp North of Elwood	1310	91	4	5	+5.1%	1377	91	4	5
Frontage Road - Van Buren to Lilac	330	98	1	1	+1.5%	335	98	1	1
Frontage Road - Lilac to Yuma	310	99	1	0	+1.5%	315	99	1	0
Frontage Road - Yuma to Lower Buckeye	170	98	1	1	+5.1%	179	98	1	1
Frontage Road - South of Lower Buckeye	30	99	1	0	+5.1%	32	99	1	0
Cotton TI Ramp A	190	99	1	0	-1.5%	188	99	1	0
Cotton TI Ramp B	350	99	1	0	-62.8%	131	99	1	0
Cotton TI Ramp C	1400	97	2	1	-2.4%	1367	97	2	1
Cotton TI Ramp D	290	95	3	2	+15.8%	336	95	3	2

Alternative 3 Traffic Volumes

SB Roadway Segment	June Traffic Volumes				Percent Difference	October Traffic Volumes			
	Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck		Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck
SR303L I-10 to Van Buren St	4060	90	4	6	+1.2%	4109	90	4	6
SR303L Ramp South of Van Buren	300	98	1	1	+1.5%	305	98	1	1
SR303L Van Buren St to Yuma Rd	4360	90	4	6	+1.5%	4425	90	4	6
SR303L Ramp North of Yuma Rd	1520	98	1	1	+1.5%	1543	98	1	1
SR303L over Yuma Rd	2840	86	5	9	+3.0%	2925	86	5	9
SR303L Ramp South of Yuma	270	97	2	1	+5.1%	284	97	2	1
SR303L Elizabeth Ave to Lower Buckeye	3110	87	5	8	+5.1%	3269	87	5	8
SR303L Lower Buckeye to Elwood	2170	82	6	12	+5.1%	2281	82	6	12
SR303L Ramp North of Elwood	940	97	2	1	+5.1%	988	97	2	1
SR303L/SR30 S-E Ramp	1180	71	9	20	-13.5%	1021	71	9	20
SR303L/SR30 S-W Ramp	990	96	3	1	+57.4%	1558	96	3	1
SR303L/SR30 E-N Ramp	400	95	4	1	+5.8%	423	95	4	1
SR303L/SR30 W-N Ramp	1970	70	6	24	+11.0%	2187	70	6	24
SR30 WB - East of SR303L	2270	95	3	2	+0.7%	2286	95	3	2
SR30 EB - East of SR303L	960	91	6	3	+0.7%	967	91	6	3
SR30 EB - West of SR303L	1760	93	5	2	-12.3%	1544	93	5	2
SR30 WB - West of SR303L	3500	96	3	1	-12.3%	3070	96	3	1
SR30 EB - Over SR303L	1360	93	5	2	-28.9%	967	93	5	2
SR30 WB - Over SR303L	2500	95	3	2	-16.9%	2078	95	3	2
SR30 WB - East of Cotton	5450	87	4	9	+0.7%	5488	87	4	9
SR30 EB - East of Cotton	2410	82	7	11	+0.7%	2427	82	7	11
Frontage Road - Van Buren to Lilac	200	98	1	1	+1.5%	203	98	1	1
Frontage Road - Lilac to Yuma	270	98	1	1	+1.5%	274	98	1	1
Frontage Road - Yuma to Lower Buckeye	430	98	1	1	+5.1%	452	98	1	1
Frontage Road - South of Lower Buckeye	20	99	1	0	+5.1%	21	99	1	0
Frontage Road - Elwood to Cotton	1160	97	2	1	+5.1%	1219	97	2	1

NB Roadway Segment	June Traffic Volumes				Percent Difference	October Traffic Volumes			
	Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck		Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck
SR303L I-10 to Van Buren St	3280	80	5	15	+1.2%	3319	80	5	15
SR303L Ramp South of Van Buren	360	98	1	1	+1.5%	365	98	1	1
SR303L Van Buren St to Yuma Rd	3640	82	5	13	+1.5%	3695	82	5	13
SR303L Ramp North of Yuma Rd	1030	97	2	1	+1.5%	1045	97	2	1
SR303L over Yuma Rd	2610	76	6	18	+3.0%	2688	76	6	18
SR303L Ramp South of Yuma	480	97	2	1	+5.1%	504	97	2	1
SR303L Elizabeth Ave to Lower Buckeye	3090	79	5	16	+5.1%	3248	79	5	16
SR303L Lower Buckeye to Ramp North of Elwood	2370	74	6	20	+5.1%	2491	74	6	20
SR303L Ramp North of Elwood	720	96	3	1	+5.1%	757	96	3	1
Frontage Road - Van Buren to Lilac	330	98	1	1	+1.5%	335	98	1	1
Frontage Road - Lilac to Yuma	310	99	1	0	+1.5%	315	99	1	0
Frontage Road - Yuma to Lower Buckeye	220	98	1	1	+5.1%	231	98	1	1
Frontage Road - South of Lower Buckeye	30	99	1	0	+5.1%	32	99	1	0
Frontage Road - Frontage Road Ramp to Elwood	790	96	3	1	+5.1%	830	96	3	1
Cotton TI Ramp A	230	99	1	0	-1.5%	227	99	1	0
Cotton TI Ramp B	400	99	1	0	-62.8%	149	99	1	0
Cotton TI Ramp C	1220	98	1	1	-2.4%	1191	98	1	1
Cotton TI Ramp D	280	95	3	2	+15.8%	324	95	3	2

Alternative 5 Traffic Volumes

SB Roadway Segment	June Traffic Volumes				Percent Difference	October Traffic Volumes			
	Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck		Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck
SR303L I-10 to Van Buren St	4480	90	4	6	+1.2%	4534	90	4	6
SR303L Ramp South of Van Buren	360	98	1	1	+1.5%	366	98	1	1
SR303L Van Buren St to Yuma Rd	4840	91	4	5	+1.5%	4913	91	4	5
SR303L Ramp North of Yuma Rd	1280	98	1	1	+1.5%	1300	98	1	1
SR303L over Yuma Rd	3560	88	5	7	+3.0%	3667	88	5	7
SR303L Ramp South of Yuma	340	97	2	1	+5.1%	358	97	2	1
SR303L Elizabeth Ave to Lower Buckeye	3900	89	4	7	+5.1%	4099	89	4	7
SR303L Lower Buckeye to Elwood	1270	96	3	1	+5.1%	1335	96	3	1
SR303L Ramp North of Elwood	2630	86	5	9	+5.1%	2765	86	5	9
SR303L Ramp to Elwood	1530	86	5	9	+5.1%	1609	86	5	9
SR303L/SR30 S-E Ramp (SR303L Offramp to EB SR30)	1090	71	8	21	-13.5%	943	71	8	21
SR303L/SR30 S-W Ramp	1330	96	3	1	+57.4%	2094	96	3	1
SR303L/SR30 E-N Ramp	670	95	4	1	+5.8%	709	95	4	1
SR303L/SR30 W-N Ramp (SR303L Onramp from WB SR30)	1860	68	6	26	+11.0%	2065	68	6	26
SR30 WB - East of SR303L	2150	95	3	2	+0.7%	2166	95	3	2
SR30 EB - East of SR303L	930	91	6	3	+0.7%	937	91	6	3
SR30 EB - West of SR303L	1980	94	4	2	-12.3%	1737	94	4	2
SR30 WB - West of SR303L	3700	96	3	1	-12.3%	3245	96	3	1
SR30 EB - Over SR303L	1310	93	5	2	-28.9%	932	93	5	2
SR30 WB - Over SR303L	2370	96	3	1	-16.9%	1970	96	3	1
SR30 WB - East of Cotton	5260	87	4	9	+0.7%	5297	87	4	9
SR30 EB - East of Cotton	2280	82	7	11	+0.7%	2296	82	7	11
SB Cotton - Elwood to US 85	1370	98	1	1	+5.1%	1440	98	1	1
Frontage Road - Van Buren to Lilac	200	98	1	1	+1.5%	203	98	1	1
Frontage Road - Lilac to Yuma	290	98	1	1	+1.5%	295	98	1	1
Frontage Road - Yuma to Lower Buckeye	300	98	1	1	+5.1%	316	98	1	1
Frontage Road - Lower Buckeye to FR Ramp	200	97	2	1	+5.1%	211	97	2	1

NB Roadway Segment	June Traffic Volumes				Percent Difference	October Traffic Volumes			
	Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck		Total Hourly Volume	Percent Auto	Percent Medium Truck	Percent Heavy Truck
SR303L I-10 to Van Buren St	3630	81	5	14	+1.2%	3674	81	5	14
SR303L Ramp South of Van Buren	390	98	1	1	+1.5%	396	98	1	1
SR303L Van Buren St to Yuma Rd	4020	83	5	12	+1.5%	4081	83	5	12
SR303L Ramp North of Yuma Rd	930	97	2	1	+1.5%	944	97	2	1
SR303L over Yuma Rd	3090	79	5	16	+3.0%	3183	79	5	16
SR303L Ramp South of Yuma	520	97	2	1	+5.1%	547	97	2	1
SR303L Elizabeth Ave to Lower Buckeye	3610	82	4	14	+5.1%	3795	82	4	14
SR303L Lower Buckeye to Ramp North of Elwood	630	95	4	1	+5.1%	663	95	4	1
SR303L south of Buckeye	2530	68	6	26	+5.1%	2660	68	6	26
SR303L Ramp North of Elwood	1120	96	3	1	+5.1%	1178	96	3	1
Frontage Road - Van Buren to Lilac	330	98	1	1	+1.5%	335	98	1	1
Frontage Road - Lilac to Yuma	320	99	1	0	+1.5%	325	99	1	0
Frontage Road - Yuma to Lower Buckeye	130	98	1	1	+5.1%	137	98	1	1
Frontage Road - South of Lower Buckeye	30	99	1	0	+5.1%	32	99	1	0
Cotton TI Ramp A	220	99	1	0	-1.5%	217	99	1	0
Cotton TI Ramp B	380	99	1	0	-62.8%	142	99	1	0
Cotton TI Ramp C	1260	97	2	1	-2.4%	1230	97	2	1
Cotton TI Ramp D	250	95	3	2	+15.8%	290	95	3	2
NB Cotton - Elwood to US 85	980	96	3	1	+5.1%	1030	96	3	1

Certificate Of Completion

Envelope Id: DF6A28FAF529423E87FA56F79CAA0C8A
Status: Completed
Subject: DocuSign: H6870_SR303L_Final Noise Report_APPROVED_3.8.18 - Copy.pdf, Attachments_Pages ...
Source Envelope:
Document Pages: 92
Signatures: 1
Envelope Originator:
Certificate Pages: 2
Initials: 0
Ivan Racic
AutoNav: Disabled
1860 Michael Faraday Drive Suite 100
EnvelopeId Stamping: Disabled
Reston, VA 20190
Time Zone: (UTC-07:00) Arizona
IRacic@azdot.gov
IP Address: 162.59.200.193

Record Tracking

Status: Original
3/8/2018 10:35:07 AM
Holder: Ivan Racic
IRacic@azdot.gov
Location: DocuSign

Signer Events	Signature	Timestamp
Ivan Racic iracic@azdot.gov Air and Noise Planner/Environmental planning Arizona Dept of Transportation Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via DocuSign	DocuSigned by: Ivan Racic D00D4A7BCC34420... Using IP Address: 162.59.200.193	Sent: 3/8/2018 10:46:48 AM Viewed: 3/8/2018 10:47:02 AM Signed: 3/8/2018 10:57:02 AM Freeform Signing

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp
Angela Newton angie@newtonec.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via DocuSign	COPIED	Sent: 3/8/2018 10:57:07 AM
Anthony Scolaro Anthony.Scolaro@wsp.com Security Level: Email, Account Authentication (None) **Electronic Record and Signature Disclosure:** Not Offered via DocuSign	COPIED	Sent: 3/8/2018 10:57:06 AM Viewed: 3/8/2018 10:58:03 AM

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	3/8/2018 10:57:07 AM
Certified Delivered	Security Checked	3/8/2018 10:47:02 AM
Signing Complete	Security Checked	3/8/2018 10:57:07 AM

Envelope Summary Events	Status	Timestamps
Completed	Security Checked	3/8/2018 10:57:07 AM

Payment Events	Status	Timestamps