



Arizona Department of Transportation

Environmental Planning

## **Final Noise Report**

**SR 24**

**Ellsworth Road – Ironwood Drive**

**Tracs No. 024 MA 001 H8915 01D/02D  
NHPP STP 024-A(200)T**

**September 12, 2019**

**Submittal Number 1**

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Federal No. 024-A(200)T**

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September 12, 2019

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# EXECUTIVE SUMMARY

This noise technical report has been developed in support of the Arizona Department of Transportation (ADOT) final design for a new, controlled-access, high-speed freeway designated State Route (SR) 24, just south of the SR 202 East Loop in Mesa, Maricopa and Pinal counties. The project will take place between Ellsworth Road, at a point south of the Powerline Floodway (located along the Ray Road alignment) where the existing SR 24 alignment ends, and Ironwood Drive in Mesa and Pinal County. The new freeway, approximately six miles long once completed but for which construction will be phased, will provide increased connectivity between East Valley communities and Phoenix, as well as accommodate anticipated traffic increases resulting from nearby expansion projects. The Phase I segment, which extended from SR 202L to Ellsworth Road and included an interim SR 202L/SR 24 traffic interchange, was completed and opened to traffic in 2014. Design changes to the TI are proposed as a part of this project, warranting further noise analysis. Therefore, this noise technical report focuses on the SR 24/Ellsworth Rd TI area. Noise analysis of other section of the project has been covered in the *Reevaluation of the Final Environmental Assessment* for the project dated January 2018.

The noise impact determination used in this analysis is based on ADOT's Noise Abatement Requirements (NAR), dated May 4, 2017. The ADOT NAR complies with the 23 CFR (Code of Federal Regulations) 772 that contains the Federal Highway Administration (FHWA) procedures for highway traffic noise analysis and establishes the Noise Abatement Criteria (NAC). The FHWA NAC specify noise level impact thresholds for different categories of land use and activities. Homes, churches, schools, and parks are classified in Categories B and C, and the allowable hourly equivalent sound level ( $L_{eq}$ ) for these categories is 67 "A"-weighted decibels (dBA). The ADOT NAR determines impacts as traffic noise levels approach the limits specified in the FHWA NAC. ADOT defines "approach" as one (1) dBA below the NAC for Categories A, B, C, D, and E; no noise impact threshold occurs for F and G Categories. Therefore, for Categories B and C, ADOT will consider mitigation for receivers when predicted traffic noise levels are 66 dBA or higher. Additionally, ADOT will consider mitigation if noise levels from the transportation project are predicted to increase substantially. A substantial noise level increase is equal to or greater than 15 dBA.

This noise analysis evaluated the existing condition, as well as future interim and ultimate Build conditions. The existing condition was analyzed by conducting ambient noise levels within the project area. The monitored noise levels ranged from 48 to 59 dBA. The interim and ultimate Build conditions were evaluated based on predicted noise levels with the proposed SR 24 mainline and ramp configurations in the interim year of 2025 and design year of 2040. A total of 23 receivers were modeled to generate noise levels for different categories of land use and activities.

Compared to the interim condition in 2025, noise levels at receivers would be 6 – 11 dBA greater in the ultimate Build condition in 2040. This is because of increased number of through lanes in each direction of SR 24 and traffic volumes in the ultimate Build condition. Noise analysis indicated that no noise barriers are recommended in either the interim or ultimate

conditions for this project because predicted noise levels would be less than the ADOT NAR threshold.

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## LIST OF ACRONYMS

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AADT	- annual average daily traffic
ADOT	- Arizona Department of Transportation
ANSI	- American National Standards Institute
CFR	- Code of Federal Regulations
dB	- decibel
dBA	- “A”-weighted decibel
DTM	- digital terrain model
FHWA	- Federal Highway Administration
ft	- feet
Hz	- hertz
kHz	- kilohertz
L <sub>Aeq(h)</sub>	- hourly “A”- weighted steady state sound level
Leq	- steady state (equivalent) sound level
L <sub>max</sub>	- maximum sound level
L <sub>min</sub>	- minimum sound level
LOS	- level of service
MAG	- Maricopa Association of Governments
MP	- milepost
mph	- miles per hour
MON	- monitoring location
NAC	- Noise Abatement Criteria
NAR	- Noise Abatement Requirements
ROW	- right-of-way
SFH	- single family home
SPL	- sound pressure level
SR	- State Route
TI	- traffic interchange
TNM 2.5	- Traffic Noise Model version 2.5
μPa	- micro-Pascals

# 1.0 INTRODUCTION

The Arizona Department of Transportation (ADOT) is in final design for the extension of State Route (SR) 24, just south of the SR 202 East Loop in Mesa, Maricopa and Pinal counties. The project will take place between Ellsworth Road, where the existing SR 24 alignment ends, and Ironwood Drive in Mesa and Pinal County. The freeway will be approximately six miles long once completed and will provide increased connectivity between East Valley communities and Phoenix, as well as accommodate anticipated traffic increases resulting from nearby expansion projects. The location of the project site is provided on page 2, Figure 1. The project vicinity map at SR 24/Ellsworth Rd TI is provided on page 3, Figure 2.

The scope of work for this project would include:

- Constructing a new interim divided roadway with two paved travel lanes in each direction and an earthen median from existing SR 24 west of Ellsworth Road to Ironwood Drive
- Constructing interim 6-ft-wide paved inside shoulders and 10-ft-wide paved outside shoulders along lanes on the ultimate SR 24 mainline
- Constructing interim 2-ft-wide paved inside shoulders and 2-ft-wide paved outside shoulders along lanes on the ultimate entrance and exit ramps of SR 24
- Widening the intersecting crossroads within the right-of-way (ROW) limits at Ellsworth Road and Ironwood Drive
- Constructing new intersecting crossroads within the ROW limits at Williams Field Road, Signal Butte Road, and Meridian Road
- Constructing ultimate drainage improvements and modifying the Ellsworth Road basin
- Widening Powerline Floodway west of Ellsworth Road within ADOT-owned ROW
- Constructing at-grade intersections controlled by traffic signals to accommodate SR 24 and crossroad traffic at Ellsworth Road, Williams Field Road, Signal Butte Road, Meridian Road, and Ironwood Drive
- Constructing the ultimate SR 24 vertical alignment at-grade through Crismon Road between Williams Field Road and Signal Butte Road, and between Meridian Road and Ironwood Drive
- Constructing the ultimate SR 24 vertical alignment above grade from Signal Butte Road to Meridian Road
- Constructing a grade-separated bridge at Mountain Road, allowing SR 24 to cross over Mountain Road with no direct access between Mountain Road and SR 24
- Constructing the SR 24 traffic interchange overpass bridges at Ellsworth Road to accommodate 2 lanes of SR 24 traffic in the eastbound and westbound directions
- Roadway striping and sign installation
- Underground geotechnical and utility investigations



This study was performed in accordance with the *Code of Federal Regulations* (Title 23, Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise) that provide procedures for conducting noise analyses to protect the public health and welfare. Furthermore, this analysis is performed in accordance with the ADOT Noise Abatement Requirements (NAR) dated May 4, 2017.

FIGURE 1. Project Location Map

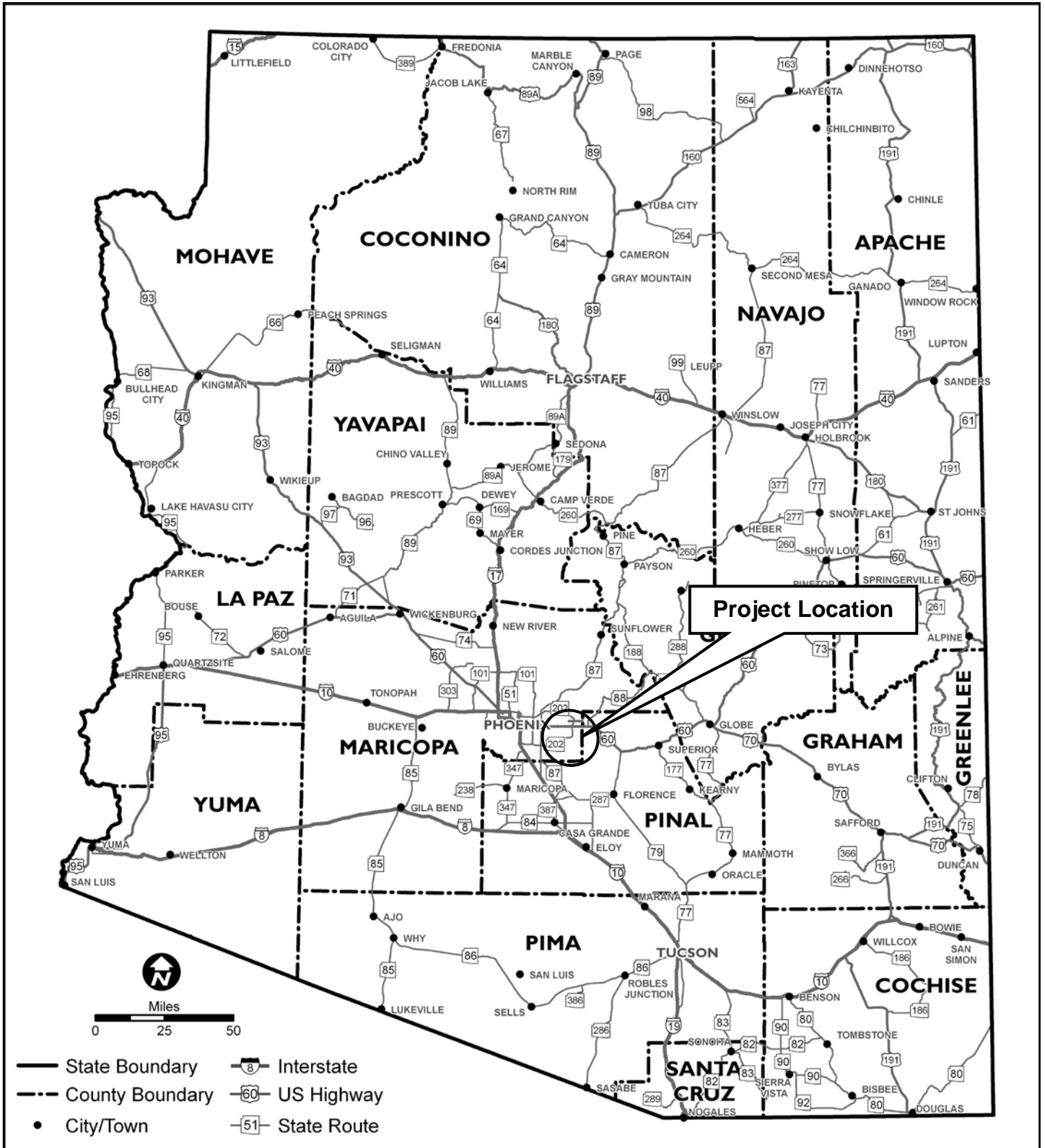
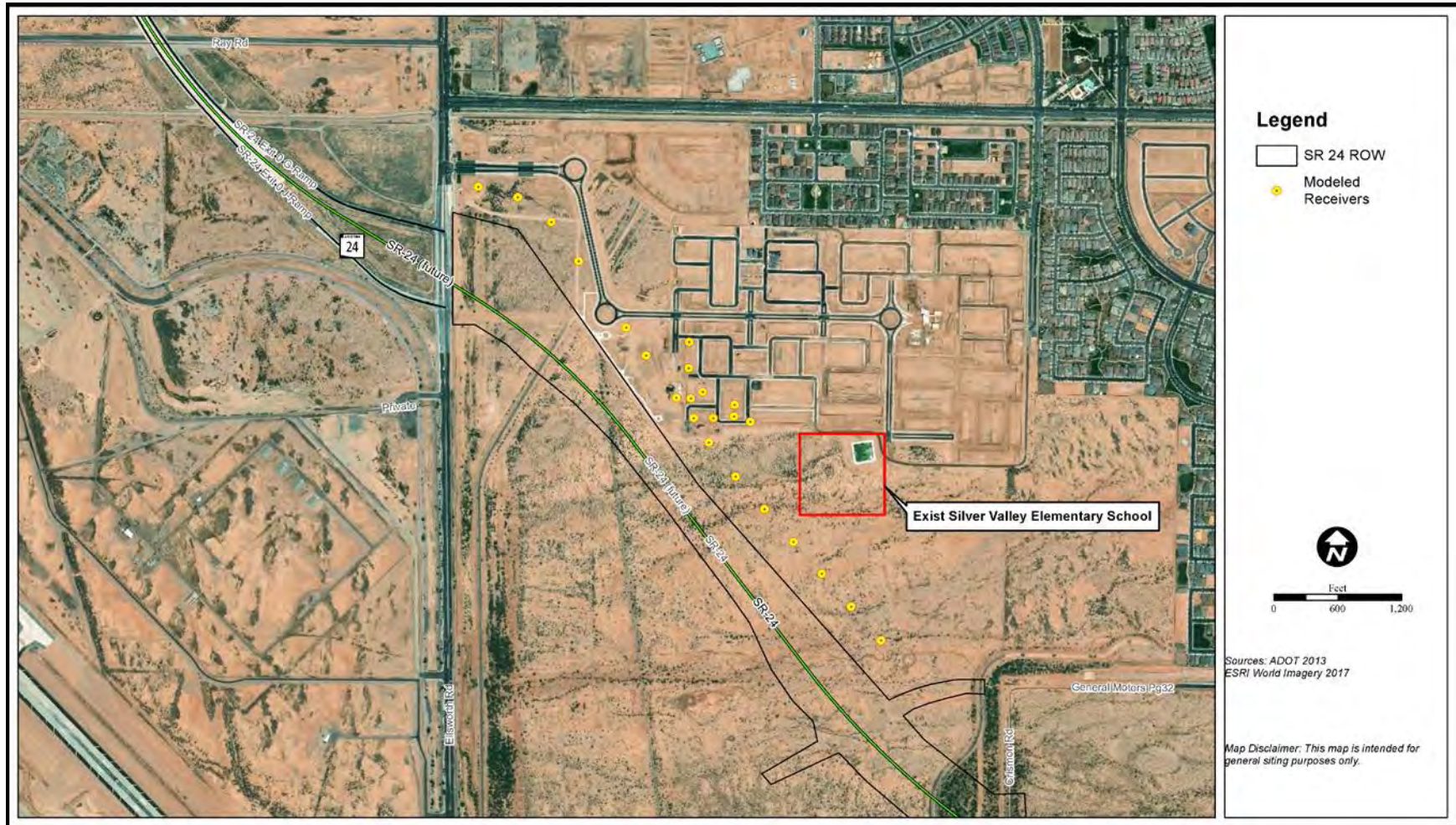


FIGURE 2. Project Vicinity Map at SR 24/Ellsworth TI



## **2.0 FUNDAMENTALS OF TRAFFIC NOISE**

### **2.1 Sound, Noise, and Acoustics**

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is often defined as unwanted sound which is loud, unexpected, or annoying.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between them. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver determine the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

### **2.2 Frequency**

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low-frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

### **2.3 Sound Pressure Levels and Decibels**

The amplitude of pressure waves generated by a sound source determines the loudness of that source. Sound pressure amplitude is measured in micro-Pascals ( $\mu\text{Pa}$ ). One  $\mu\text{Pa}$  is approximately one hundred billionth (0.0000000001) of normal atmospheric pressure. Sound pressure amplitudes for different kinds of noise environments can range from less than 100 to 100,000,000  $\mu\text{Pa}$ . Because of this huge range of values, sound is rarely expressed in terms of  $\mu\text{Pa}$ . Instead, a logarithmic scale is used to describe sound pressure level (SPL) in terms of decibels (dB). The threshold of hearing for young people is about 0 dB, which corresponds to 20  $\mu\text{Pa}$ .

### **2.4 Addition of Decibels**

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3-dB increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions. For example, if one automobile produces an SPL of 70 dB when it passes an observer, two cars passing simultaneously would not produce 140 dB—rather, they would combine to produce 73 dB. Under the decibel scale, three sources of equal loudness together produce a sound level 5 dB louder than one source.

## 2.5 A-Weighted Decibels

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Although the intensity (energy per unit area) of the sound is a purely physical quantity, the loudness or human response is determined by the characteristics of the human ear.

Human hearing is limited in the range of audible frequencies as well as in the way it perceives the SPL in that range. In general, people are most sensitive to the frequency range of 1,000–8,000 Hz, and perceive sounds within that range better than sounds of the same amplitude in higher or lower frequencies. To approximate the response of the human ear, sound levels of individual frequency bands are weighted, depending on the human sensitivity to those frequencies. Then, an “A-weighted” sound level (expressed in units of dBA) can be computed based on this information.

The A-weighting network approximates the frequency response of the average young ear when listening to most ordinary sounds. When people make judgments of the relative loudness or annoyance of a sound, their judgments correlate well with the A-scale sound levels of those sounds. Other weighting networks have been devised to address high noise levels or other special problems (e.g., B-, C-, and D-scales), but these scales are rarely used in conjunction with highway-traffic noise. Noise levels for traffic noise reports are typically reported in terms of A-weighted decibels or dBA. Table 1 describes typical A-weighted noise levels for various noise sources.

TABLE 1 Typical A-Weighted Noise Levels		
Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	— 110 —	Rock band
Jet fly-over at 1000 feet	— 100 —	
Gas lawn mower at 3 feet	— 90 —	
Diesel truck at 50 feet at 50 mph	— 80 —	Food blender at 3 feet Garbage disposal at 3 feet
Noisy urban area, daytime	— 70 —	Vacuum cleaner at 10 feet Normal speech at 3 feet
Gas lawn mower, 100 feet Commercial area	— 60 —	
Heavy traffic at 300 feet	— 50 —	Large business office Dishwasher next room
Quiet urban daytime	— 40 —	Theater, large conference room (background)
Quiet urban nighttime	— 30 —	Library
Quiet suburban nighttime	— 20 —	Bedroom at night
Quiet rural nighttime	— 10 —	Broadcast/recording studio
Lowest threshold of human hearing	— 0 —	Lowest threshold of human hearing

Source: ADOT 2008.

## 2.6 Human Response to Changes in Noise Levels

As discussed above, doubling sound energy results in a 3 dB increase in sound. However, given a sound level change measured with precise instrumentation, the subjective human perception of a doubling of loudness will usually be different than what is measured.

Under controlled conditions in an acoustical laboratory, the trained, healthy human ear is able to discern 1 dB changes in sound levels, when exposed to steady, single-frequency (“pure-tone”) signals in the mid-frequency (1,000 Hz–8,000 Hz) range. In typical noisy environments, changes in noise of 1 to 2 dB are generally not perceptible. However, it is widely accepted that people are able to begin to detect sound level increases of 3 dB in typical noisy environments. Further, a 5 dB increase is generally perceived as a distinctly noticeable increase, and a 10 dB increase is generally perceived as a doubling of loudness. Therefore, a doubling of sound energy (e.g., doubling the volume of traffic on a highway) that would result in a 3 dB increase in sound, would generally be perceived as barely detectable.

## 2.7 Noise Descriptors

Noise in our daily environment fluctuates over time. Some fluctuations are minor, but some are substantial. Some noise levels occur in regular patterns, but others are random. Some noise levels fluctuate rapidly, but others slowly. Some noise levels vary widely, but others are relatively constant. Various noise descriptors have been developed to describe time-varying noise levels. The most commonly used noise descriptors in traffic noise analysis are:

- **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 abatement criteria used by ADOT and the Federal Highway Administration (FHWA).
- **Maximum Sound Level ( $L_{max}$ ):**  $L_{max}$  is the highest instantaneous sound level measured during a specified period.
- **Minimum Sound Level ( $L_{min}$ ):**  $L_{min}$  is the lowest instantaneous sound level measured during a specified period.

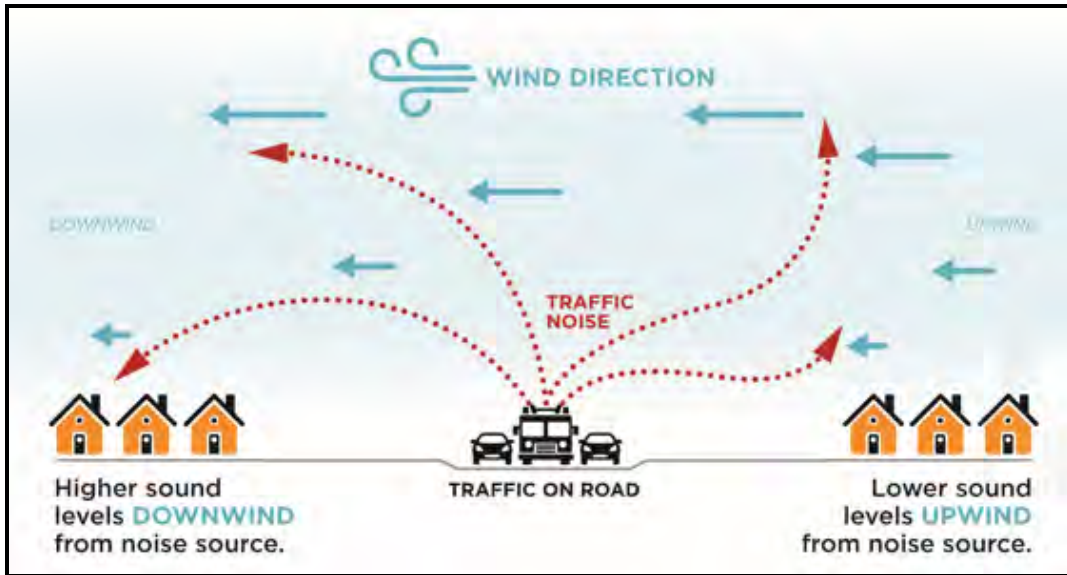
## 2.8 Weather Conditions

Changes in weather conditions also affect how well a noise barrier performs. Temperature inversions and downwind conditions can increase sound levels in neighborhoods protected by a noise barrier. Temperature lapses and upwind conditions can further reduce sound levels in neighborhoods protected by a noise barrier. The changes in sound levels will depend on the specific wind and temperature conditions.

Changing wind speeds above the ground cause sound waves to bend toward or away from the earth — a process called refraction. The change in the sound level depends on the differences

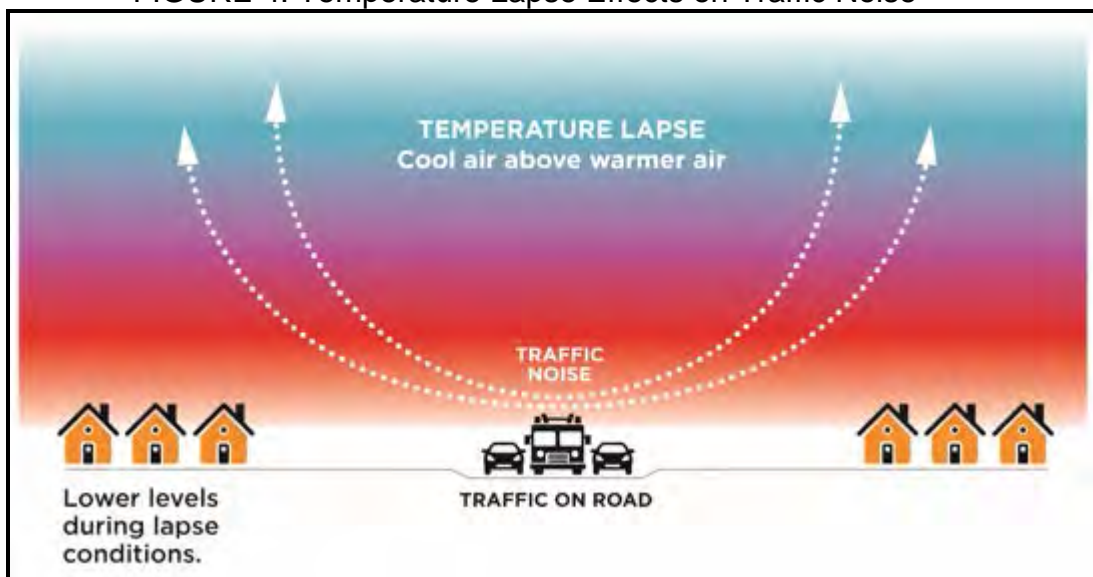
in wind speeds above the ground and the wind direction. You might notice that sound levels are higher when the wind is blowing from the highway toward you (downwind) as illustrated below. Conversely, you might notice that sound levels are lower when the wind is blowing away from you and toward the highway (upwind).

FIGURE 3. Wind Direction Effects on Traffic Noise



The temperature of the air above the ground changes with height. A temperature lapse occurs when the air above the ground is cooler than the air near the ground. Temperature lapses are common during the day. Lapses cause sound waves to bend away from the earth and reduce sound levels in nearby communities as illustrated below. You might notice that sound levels are lower during the day than at night even though there may be more traffic on the road.

FIGURE 4. Temperature Lapse Effects on Traffic Noise



### 3.0 TRAFFIC NOISE ANALYSIS

#### 3.1 FHWA and ADOT Noise Criteria

ADOT considers mitigation for receivers predicted to be impacted by increased noise levels associated with a proposed transportation improvement project. This analysis determines the traffic noise impacts based upon FHWA Noise Abatement Criteria (NAC), which is referred to in the ADOT NAR dated May 4, 2017. The FHWA NAC specify an allowable traffic noise level for different categories of land uses and activities.

The ADOT NAR describes impacts if the noise level “approaches” the allowable limits of the FHWA NAC. ADOT defines “approach” as one (1) dBA below the NAC for Categories A, B, C, D, and E and there is no noise impact threshold for Categories F and G. Table 2 shows the FHWA NAC noise level for each land use category. Homes, churches, schools, and parks are classified in Categories B and C, and the allowable hourly  $L_{eq}$  for these categories is 67 dBA.

Activity Category	$L_{Aeq(h)}$ <sup>[1]</sup> , dBA	Description of Activity Category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B <sup>[2]</sup>	67 (Exterior)	Residential
C <sup>[2]</sup>	67 (Exterior)	Active sport areas, amphitheatres, 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 studios, recording studios, schools, and television studios
E <sup>[2]</sup>	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	---	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	---	Undeveloped lands that are not permitted

Notes:  
 [1]. The hourly equivalent sound level,  $L_{Aeq(h)}$ , represents the A-weighted sound level that contains the same amount of acoustic energy as the actual time-varying A-weighted sound level over one hour.  
 [2]. Includes undeveloped lands permitted for this activity category.

Source: ADOT NAR Rev 2017-05-04

For Categories B and C, ADOT will consider mitigation for receivers with exterior traffic noise levels that are equal to or exceed 66 dBA. For Category E, ADOT will consider mitigation for receivers with exterior traffic noise levels that are equal to or exceed 71 dBA. Additionally,



ADOT will consider mitigation if the transportation improvement project is predicted to result in a substantial increase in noise level compared to the existing measured noise levels. A substantial noise level increase is equal to or greater than 15 dBA. In determining and reducing traffic noise impacts, exterior areas are given primary consideration and ADOT generally will consider mitigation only where frequent human use occurs.

### 3.2 Sensitive Land Uses in the Study Area

Existing land uses within the TI area consist of residential and vacant. The northeast quadrant of the TI will be developed into a master phased community called Cadence at Gateway. Residential land use of Activity Category B within the study area includes existing single family homes and permitted future developments. The Activity Category C includes Silver Valley Elementary School. The existing land use within the project area was examined based on MAG land use map and the site visit.

### 3.3 Existing Noise Levels

Existing noise-sensitive land uses within the project area were identified using land-use maps, aerial photographs, and site reconnaissance. The noise analysis of this project used one (1) geographical section that correspond to noise receiver locations.

In total, 23 noise receivers were evaluated in the noise model for different land use categories and activities. The modeled noise receivers represent different activity categories such as residential (Category B), and undeveloped lands approved for future residential subdivisions. Receivers were modeled 300 feet away from the SR 24 ROW on undeveloped land per ADOT NAR. Each modeled noise receiver was titled two parts as R#. R stands for receiver, and followed by sequential numbering, #.

Table 3 shows the description of the sections and the number of modeled receivers in each section.

TABLE 3 Location of Modeled Receivers		
Section	Number of Modeled Receivers	Description of Section
1	23	SR 24 WB side between Ellsworth Rd and Williams Field Rd
Total Number of Modeled Receivers		23

Five (5) different sites were selected for noise monitoring within the project area (monitoring locations are labeled “MON”) to document existing traffic noise levels. Noise monitoring was conducted on August 13, 2019. During the monitoring, weather conditions (temperature, relative humidity, wind speed and direction, and sky condition) were documented (see Appendix B). A Larson Davis System 824 with sound level meter and real-time analyzer, which complies with ANSI S1.4 and Type I Standards, was used during the noise monitoring. The noise monitoring followed the procedures specified in the report FHWA-PD-96-046/DOT-VNTC-FHWA-96-5, *Measurement of Highway-Related Noise*. The monitoring results are summarized in Table 4.

Section	Monitor Number	Address/Description	Monitoring Result Leq, dBA
1	MON-1	Undeveloped land (future commercial) (approx. 300 feet to SR 24 ROW, at milepost 1.44)	53
	MON-2	Undeveloped land (future residential under grading) (approx. 300 feet to SR 24 ROW, at milepost 1.74)	59
	MON-3	Corner between Teal Ave and Warren Rd (approx. 740 feet to SR 24 ROW, at milepost 1.96)	53
	MON-4	Undeveloped land (future residential under grading) (approx. 300 feet to SR 24 ROW, at milepost 2.00)	---
	MON-5	Undeveloped land (future residential under grading) (approx. 300 feet to SR 24 ROW, at milepost 2.17)	48
Notes: Mon 4 site was not monitored because construction vehicles were working in the area. Construction equipment were operating in the distance when monitoring for Mon 2, Mon 3, and Mon 5.			

The monitored noise levels represent the existing noise conditions within the TI area. The average ambient noise levels from the measurements ranged from 48 dBA to 59 dBA. The lowest monitoring noise level was recorded from sites MON-01 and MON-03. The highest monitoring noise level was recorded from site MON-02 on undeveloped land for future residential subdivision. Detailed noise level monitoring information is located in Appendix B of this report.

### 3.4 TNM 2.5 Modeling Approach and Assumptions

The FHWA-approved highway noise computer model Traffic Noise Model (TNM) 2.5 was used for the noise-level computations and mitigation analysis. Standard English units of measurement were used throughout this analysis.

Traffic noise levels are affected mainly by roadway geometry, traffic volumes, traffic speeds, traffic mix (percentage of cars, medium trucks and heavy trucks), and shielding effects between noise sources and receivers. These variables were input into the TNM 2.5 model to predict future noise levels at the sensitive receiver locations. If the predicted unmitigated noise levels are less than the NAR threshold of 66 dBA, no noise impacts would occur and no noise mitigation is warranted. Otherwise, mitigation consisting of noise barriers within the right-of-way (ROW) would be evaluated. The barrier heights are then adjusted to achieve predicted mitigated noise levels of less than 66 dBA as applicable. Noise barriers are recommended if they meet the ADOT NAR “feasible” and “reasonable” criteria. Noise barriers are considered the most cost effective and accepted technique to mitigate traffic noise. Noise barriers may consist of earth berms or concrete/masonry walls, or a combination of the two.

#### Roadway Geometry

The horizontal and vertical geometry of the proposed design of the SR 24 mainline and ramps utilized in this analysis were obtained from the 60% final design files by Stanley Consultants, Inc. Each travel lane of SR 24 mainline was modeled individually. Speed was modeled 5 miles per hour (mph) higher than posted speed limit.

## **Traffic Volumes**

FHWA's criteria specify that the noisiest condition be modeled for the project design year. In general this should reflect level of service (LOS) C traffic conditions during the peak noise hour, with traffic moving at 5 miles per hour above the posted speed limits. If future peak hour traffic volumes are less than maximum LOS C volumes, future peak hour traffic volumes will be utilized. For this project, ten (10) percent of the annual average daily traffic (AADT) volumes derived from the approved SR 24 DCR Traffic Analysis Report dated September 18, 2017 were used as peak hour volumes in the noise model for the ultimate condition. For the interim condition, AADT volumes from requested MAG traffic demand model received on August 19, 2019 were used. Traffic volumes with lateral distribution per lane on SR 24 mainline were applied. The traffic volumes used in this analysis were derived from *SR 24 DCR Traffic Analysis Report* dated September 18, 2017 and MAG traffic demand model received on August 19, 2019 (See Appendix C).

## **Traffic Mix**

Traffic mix is the percentage of vehicles by type, typically including cars, medium trucks, and heavy trucks. Traffic mix is an important factor on the magnitude of noise levels. Generally, heavy trucks generate more noise than cars and medium trucks. Therefore, the higher percentage of heavy truck, the louder the noise levels would be.

Vehicle types are defined as follows:

- Cars: 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.

The traffic mix percentage used in this analysis are based on the request MAG traffic demand model received on August 19, 2019 and is included in Appendix C.

## **Traffic Speed**

For the ultimate Build condition, SR 24 mainline was modeled at an operating speed of 70 mph (5 mph above the posted speed limit). The service TI on-ramp and off-ramp speeds were modeled at 55 mph and the Ramp "N-E" speed was modeled at 55 mph. The cross street speeds were modeled at 50 mph. For the interim Build condition, SR 24 mainline was modeled at 50 mph. The posted speed limit and modeled speeds were confirmed by Stanley Consultants, Inc. In additional, ramp acceleration and deceleration were modeled in line with *NCHRP report Supplemental Guidance on the Application of FHWA's Traffic Noise Model*.

## Shielding Effects

TNM 2.5 can account for the noise shielding effects created by existing noise barriers, privacy walls, buildings, and terrain changes that are an obstruction between noise sources and receivers. Neighborhood privacy walls and large commercial or apartment buildings were modeled as barriers. Cut-and-fill slopes and corresponding elevation changes were modeled as terrain lines. Rows of homes in neighborhoods were modeled as building rows. The loose soil ground type was assumed in the model. Jersey barriers were modeled along the WB freeway edge and median with 34-inch and 44-inch height. The existing privacy walls measuring approximately 6 feet high that typically shield residential subdivisions were also represented, as was a potential 6 feet high subdivision perimeter wall along SR 24 ROW for future residential developments.

Other assumptions included average pavement type and default weather. These default assumptions are FHWA-recommended values.

### 3.5 Construction Noise Impacts

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. Construction equipment is typically considered as a point source, as opposed to traffic which is considered as a line source; therefore the noise level decreases, theoretically, by 6 dB(A) per doubling the distance from it, as opposed to 3 dB(A) for line source. Noise levels at various distances using listed equipment are shown in Table 5. 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.”

Equipment	Land Use	Residential	Descriptor		L10
	R_300 ft	R_600 ft	R_900 ft	R_1200 ft	R_1500 ft
Auger Drill Rig	64.8	58.8	55.3	52.8	50.8
Boring Jack Power Unit	67.4	61.4	57.9	55.4	53.4
Compactor (ground)	63.7	57.7	54.1	51.6	49.7
Concrete Mixer Truck	62.3	56.2	52.7	50.2	48.3
Dump Truck	59.9	53.9	50.4	47.9	45.9

Excavator	64.2	58.1	54.6	52.1	50.2
Generator	65.1	59.0	55.5	53.0	51.1
Compressor (air)	61.1	55.1	51.6	49.1	47.1
Grader	68.5	62.4	58.9	56.4	54.5
Warning Horn	57.6	51.6	48.1	45.6	43.6
All Other Equipment > 5 HP	69.4	63.4	59.9	57.4	55.4
Bar Bender	60.4	54.4	50.9	48.4	46.5
Concrete Pump Truck	61.8	55.8	52.3	49.8	47.9
Soil Mix Drill Rig	64.4	58.4	54.9	52.4	50.4
Concrete Saw	70.0	64.0	60.5	58.0	56.0
Auger Drill Rig	64.8	58.8	55.3	52.8	50.8
Roller	60.4	54.4	50.9	48.4	46.5

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. Such measures may be:

- Jetting,
- Predrilling
- Cast-in-place or auger cast piles
- Non-displacement piles
- Pile cushioning
- Using alternative non-impact drivers
- Scheduling activities to minimize disturbance at near-construction sites

To minimize noise impacts on the neighborhoods during construction, the following mitigation measures will be taken:

- Exhaust systems on equipment will be kept in good working order, in accordance with Section 104.08, *Prevention of Air and Noise Pollution* of the ADOT Standard Specifications for Road and Bridge Construction;
- Engine enclosures and intake silencers will be used where appropriate;
- Equipment will be maintained on a regular basis;
- New equipment will meet new noise emission standards;
- Stationary equipment will be located as far away from neighborhoods as possible; and
- The public shall be notified of construction operations and schedules by the ADOT's Communications office during construction.

## 4.0 NOISE MITIGATION EVALUATION

### 4.1 Noise Mitigation Guidelines

The ADOT NAR adopted in 2017 provides guidelines for noise abatement based on both the “feasible” and “reasonable” criteria. The ADOT NAR defines “feasibility” based on engineering and acoustical considerations (e.g., if a barrier can be built given the topography of the location; consider access, drainage, safety, or maintenance requirements, can a substantial noise reduction be achieved? are other noise sources present in the area? etc.). According to the ADOT NAR, engineering feasibility factors of abatement shall include, but not limited to:

- Safety – noise barriers will not be constructed in such a way as to create a potential safety hazard or to inhibit response to a safety emergency.
- Barrier height – due to safety, structural and wind load considerations, ADOT will not normally construct barriers higher than 20 feet, as a stand-alone structure. However, a wall segment height may be up to 24 feet.
- Topography – the topography of the local area may potentially preclude the use or reduce the effectiveness of noise abatement measures such as barriers and berms.
- Drainage – any noise abatement measure constructed must provide for adequate drainage, both as a safety concern and to prolong the lifespan of the roadway.
- Utilities – in the event of a conflict between existing or planned utilities and potential noise abatement measures, any extra cost involved with utility relocation or modification may be included in the wall cost when comparing against the cost-per-benefited-receptor.
- Maintenance requirements – abatement measures must be designed and constructed in such a way as to allow access to perform maintenance activities both for the barrier and for adjacent properties.
- Access to adjacent properties – abatement measures must not be designed or constructed in a manner that denies access to any property adjacent to the barrier.
- Overall project purposes – the use of abatement measures must be consistent with the overall purpose of the project.

For a noise abatement measure to be acoustically feasible ADOT requires achievement of at least a five (5) dBA highway traffic noise reduction at 50% of impacted receptors.

The “reasonable” criterion implies that common sense and good judgment were applied in arriving at a decision. According to the ADOT NAR, reasonability of abatement shall include, but not be limited to:

- Viewpoints or preferences of property owners and residents – The preferences of the property owners and residents of the benefited receptors of a noise barrier will be taken into account when determining whether the barrier is considered reasonable.
- Noise reduction design goal – Noise barriers should be designed to reduce projected unmitigated noise levels by at least seven (7) dBA for benefited receptors closest to the transportation facility. To be considered reasonable, at least half of the benefited receptors in the first row shall achieve this level of noise reduction.

- Cost effectiveness – 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.

## 4.2 Substantial Noise Level Increase

The projected increases in noise levels for receivers that were monitored are shown in Table 6. The monitoring results represent the existing noise levels. The TNM 2.5 2040 unmitigated column represents the future predicted noise level in the ultimate Build Condition. The difference between these two values, the arithmetic increase, is the projected increase in noise levels.

TABLE 6 Substantial Noise Level Increases					
Section	Monitor Number	Noise Receiver	Noise Level Leq, dBA		
			Monitoring Result	TNM 2.5 2040 unmitigated	Arithmetic Increase
1	MON-1	R2	53	59	6
	MON-2	R6	59	61	2
	MON-3	R14	53	53	0
	MON-4	R18	---	62	---
	MON-5	R20	48	61	13

Note:  
Mon 4 site was not monitored because construction vehicles were working in the area.

The arithmetic increases between the monitoring levels and future predicted noise levels range from 0 to 13 dBA; no monitoring sites show a significant increase of equal to or greater than 15 dBA. As a result, noise mitigation was not evaluated due to the substantial noise level increases predicted for monitoring sites.

### **4.3 Noise Modeling Results**

Appendix A shows noise receiver locations and Appendix D shows the predicted noise levels for the interim Build and ultimate Build conditions based on the results of the TNM 2.5 modeling. Modeling results are rounded to the nearest decibel before comparisons are made. In some cases, this can result in relative changes that may not appear intuitive. For example, the difference between sound levels of 64.4 and 64.5 dBA is 0.1 dBA. However, after rounding to the nearest whole number, the difference is reported as 1 dBA. Noise modeling and results for Section 1 are discussed below.

#### **Section 1: SR 24 WB Side between Ellsworth Rd and Williams Field Rd**

Section 1 has 23 modeled receivers representing receptors at future commercial, future residential development on undeveloped land, and existing single family homes. The predicted noise levels and number of dwelling units represented by each receiver is shown in Appendix D. The noise levels of the receivers are less than the ADOT NAR threshold for the corresponding NAC categories in the 2025 interim Build Condition and 2040 ultimate Build Condition. As a result, no consideration of noise mitigation is warranted.



## 5.0 CONCLUSION

This noise report provides the existing monitored and future predicted noise levels in accordance with the ADOT NAR for the SR 24 project. This study evaluates impacts from predicted traffic noise levels that would result during the noisiest interim and ultimate conditions for the planned extension of the SR 24 freeway.

Compared to the interim condition in 2025, noise levels of receivers would be 6 – 11 dBA greater in the ultimate Build condition in 2040. This is because of increased number of through lanes in each direction of SR 24 and traffic volumes in the ultimate Build condition. Noise analysis indicated that no noise barriers are recommended for either the interim or ultimate conditions for this project because predicted noise levels would be less than the ADOT NAR threshold.

The Date of Public Knowledge is the date of approval of the Categorical Exclusion (CE), the Finding of No Significant Impact (FONSI) or the Record of Decision (ROD), as defined in 23 CFR 771. This project is Federal funded. For state-funded projects, the Date of Public Knowledge is the date of approval of the appropriate environmental document.

This information will be made available to the local officials with the responsibility for making zoning/permitting decisions for that location. This information will be accompanied by the statement: “This information is presented purely to assist with noise-compatible land use planning decision making. Abatement for lands permitted after the Date of Public Knowledge for this project is not eligible for federal aid.”

## References

Arizona Department of Transportation, *Noise Abatement Requirements*, May 2017.

Arizona Department of Transportation, *Reevaluation of the Final Environmental Assessment for SR 24, Ellsworth Road to Ironwood Road, Phase II Interim*, January 2018.

Arizona Department of Transportation, *SR-24 Design Concept Report Traffic Analysis Report*, September 2017.

Arizona Department of Transportation, *Standard Specifications for Road and Bridge Construction*, 2008.

U.S. Code of Federal Regulations, Title 23, Part 772. *Procedures for Abatement of Highway Traffic Noise and Construction Noise*.

U.S. Department of Transportation, Federal Highway Administration, *FHWA Roadway Construction Noise Model User's Guide*, January 2006.

U.S. Department of Transportation, Federal Highway Administration, *Highway Traffic Noise Analysis and Abatement Policy and Guidance*, June 1995.

U.S. Department of Transportation, Federal Highway Administration, *Highway Traffic Noise Prediction Model*, FHWA-RD-77-108, December 1978.

U.S. Department of Transportation, Federal Highway Administration, *Measurement of Highway-Related Noise*, FHWA-PD-96-046, May 1996.

# Glossary of Terms

**Design Year** – The future year used to estimate the probable traffic volume for which a highway is designed. Normally, traffic estimates are projected 20 years into the future from the estimated start date of construction.

**Existing Sound Level** – The current noise level, made up of all natural and manmade noises normally present within a particular area. The existing sound level provides a reference point for determining noise impacts when transportation improvements or new highways are being considered.

**Insertion Loss** – A term used in noise analysis describing the projected noise reduction that results when a noise barrier is placed between a noise source and a receiver.

**$L_{eq}$**  – The equivalent steady-state, A-weighted sound level which, in a stated period of time, would contain the same acoustical energy as the time-varying sound levels during the same period.

**Noise Receiver** – The technical term used in noise modeling to describe the location of a potential noise impact.

**Shielding** – Any construction or natural barrier which, when interposed between the noise source and the receiver, will provide an excess reduction in roadway noise.

# TNM Model Runs Description

TNM File Name	Description
2025InterimCondition	2025 Interim Condition with SR 24 interim roadway alignment and lane configuration. No barriers recommended
2040UltimateCondition	2040 Ultimate Condition with SR 24 ultimate roadway alignment and lane configuration. No barriers recommended

# **APPENDIX A**

## **Noise Receiver Locations**

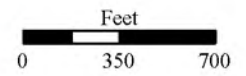
SR 24  
Ellsworth Road –  
Ironwood Drive

024 MA 001 H8915 01D/02D



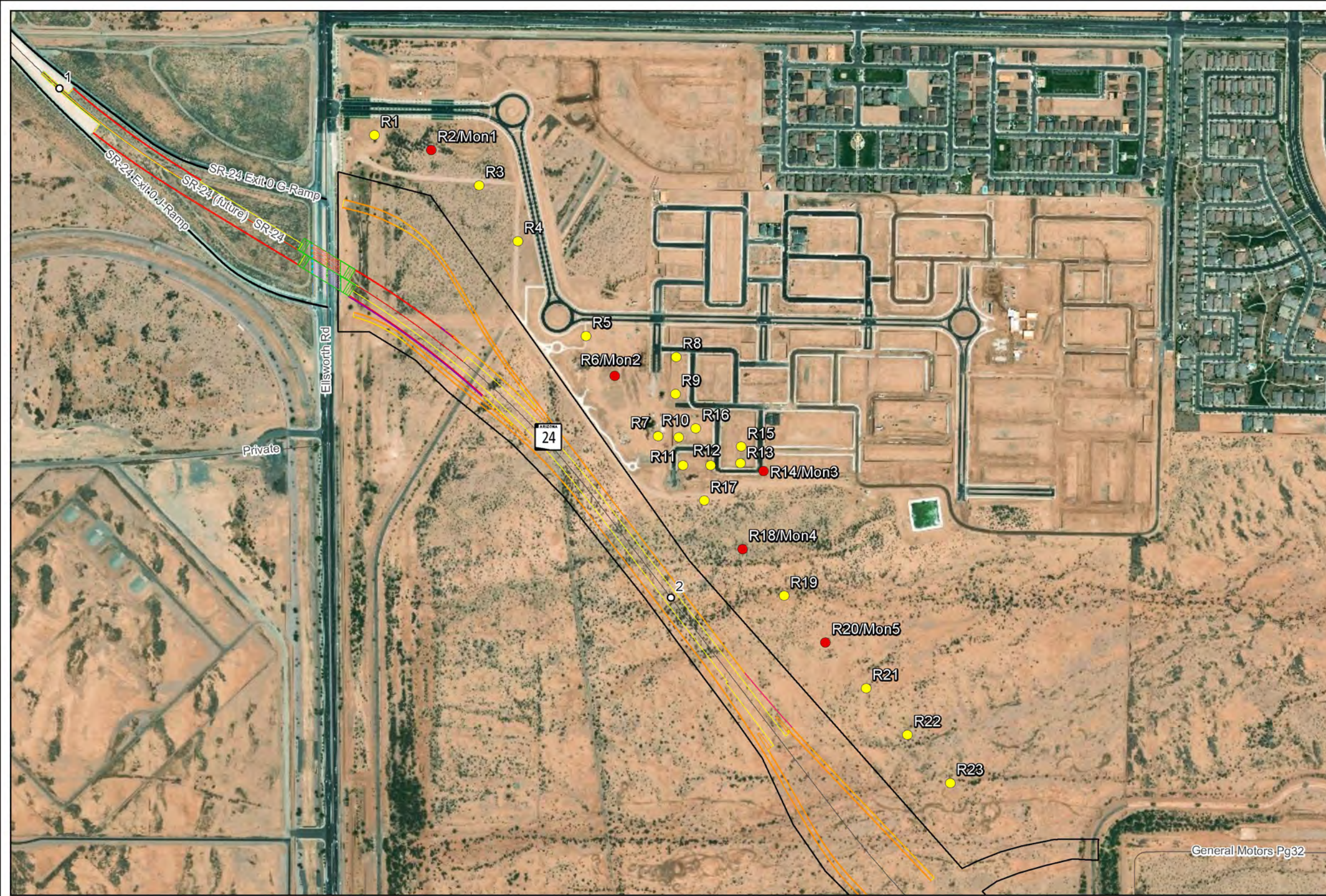
Legend

- SR 24 ROW
- Noise Receivers
- Monitoring Sites
- Mileposts



Sources: ADOT 2013; AZTEC (2019)  
ESRI World Imagery 2017

Map Disclaimer: This map is intended for  
general siting purposes only.



# **APPENDIX B**

## **Noise Level Monitoring Results**



4561 E McDowell Road  
 Phoenix, AZ 85008  
 Tel: (602) 454-0402  
 Fax: (602) 458-7465

## ROADWAY TRAFFIC NOISE LEVEL MEASUREMENT DATA SHEET

**Project Number/Name:** SR 24 (H8915 01D/02D) **Date:** 08/13/2019  
Ellsworth Rd Traffic Interchange

**Site Number/Description:** MON-01, (Lat/Long: 33.319160, -111.633248)  
Undeveloped land (future commercial)  
(approx. 300 feet to SR 24 ROW, at milepost 1.44)

**(Prepared by)/Crew:** David Shu

**Temperature:** 106 °F **Relative Humidity:** 11 % **Wind & Direction:** 9 mph/NNW **Sky:** Fair

**SLM Make/Model:** LDL 824 **Calibration Make/Model:** LDL CA 200 @ 114 dB

**Calibration:**



Sample	Time		Sound Level, dBA			Traffic Count		
	Start	Duration	L <sub>MIN</sub>	L <sub>EQ</sub>	L <sub>MAX</sub>	Auto	Med. Trk.	Hvy. Trk.
1	2:47 PM	10 mins	44.2	53.1	63.8	---	---	---
2	2:58 PM	10 mins	46.3	52.7	59.5	---	---	---
3	3:09 PM	10 mins	45.7	52.3	60.2	---	---	---

**NOTES:**

---





Figure 1. Looking west



Figure 2. Looking north



4561 E McDowell Road  
 Phoenix, AZ 85008  
 Tel: (602) 454-0402  
 Fax: (602) 458-7465

## ROADWAY TRAFFIC NOISE LEVEL MEASUREMENT DATA SHEET

**Project Number/Name:** SR 24 (H8915 01D/02D)  
Ellsworth Rd Traffic Interchange **Date:** 08/13/2019

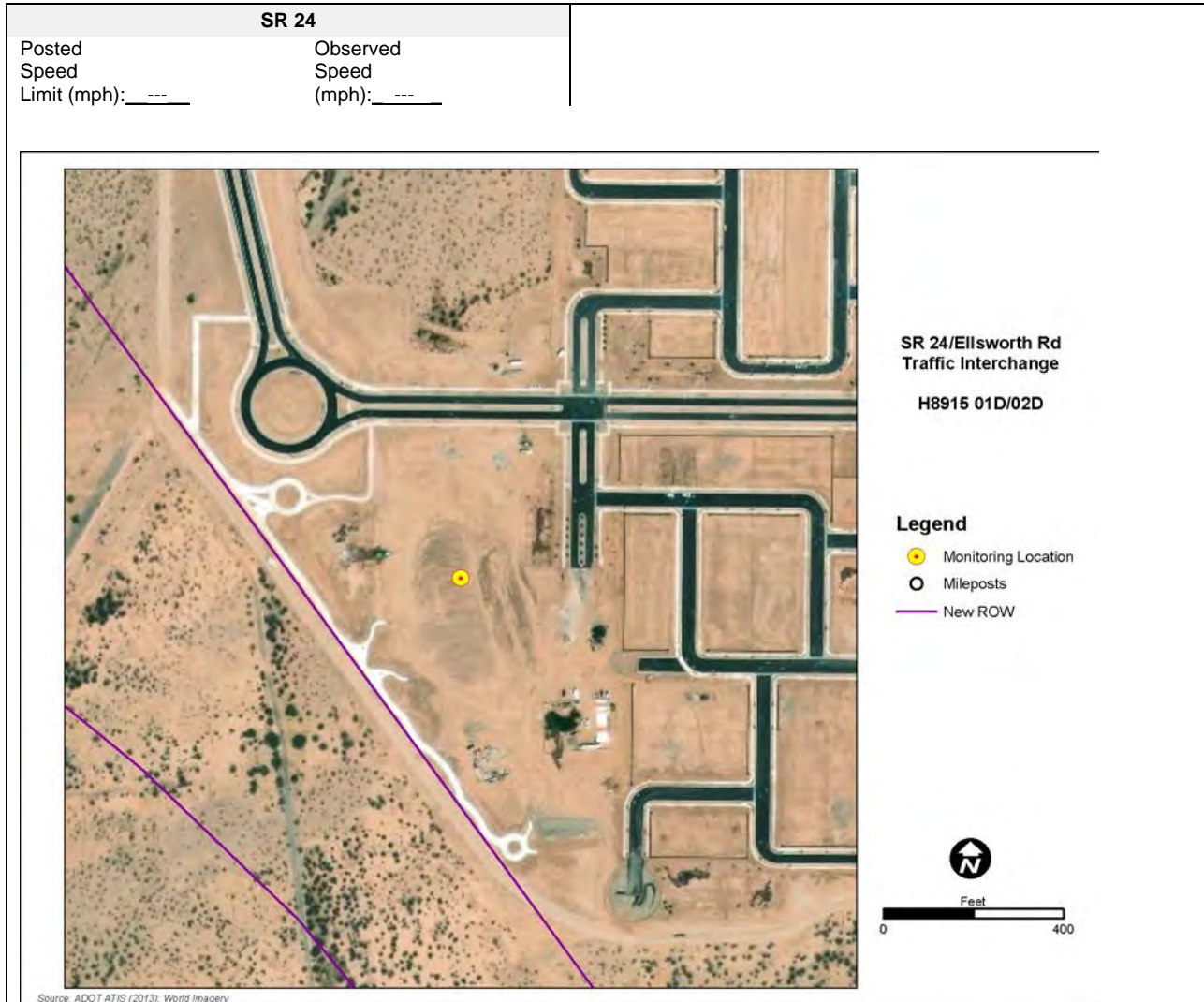
**Site Number/Description:** MON-02, (Lat/Long: 33.315098, -111.629268)  
Undeveloped land (future residential under grading)  
(approx. 300 feet to SR24 ROW, at milepost 1.74)

**(Prepared by)/Crew:** David Shu

**Temperature:** 99 °F **Relative Humidity:** 17 % **Wind & Direction:** 6 mph/W **Sky:** Fair

**SLM Make/Model:** LDL 824 **Calibration Make/Model:** LDL CA 200 @ 114 dB

**Calibration:**



Sample	Time		Sound Level, dBA			Traffic Count		
	Start	Duration	L <sub>MIN</sub>	L <sub>EQ</sub>	L <sub>MAX</sub>	Auto	Med. Trk.	Hvy. Trk.
1	10:40 AM	10 mins	54.1	58.2	61.7	---	---	---
2	10:51 AM	10 mins	56.0	58.7	63.5	---	---	---
3	11:02 AM	10 mins	56.2	58.9	61.6	---	---	---

**NOTES:** backhoe working approximately 500 ft away



Figure 1. Looking west



Figure 2. Looking north



4561 E McDowell Road  
 Phoenix, AZ 85008  
 Tel: (602) 454-0402  
 Fax: (602) 458-7465

# ROADWAY TRAFFIC NOISE LEVEL MEASUREMENT DATA SHEET

**Project Number/Name:** SR 24 (H8915 01D/02D) **Date:** 08/13/2019  
Ellsworth Rd Traffic Interchange

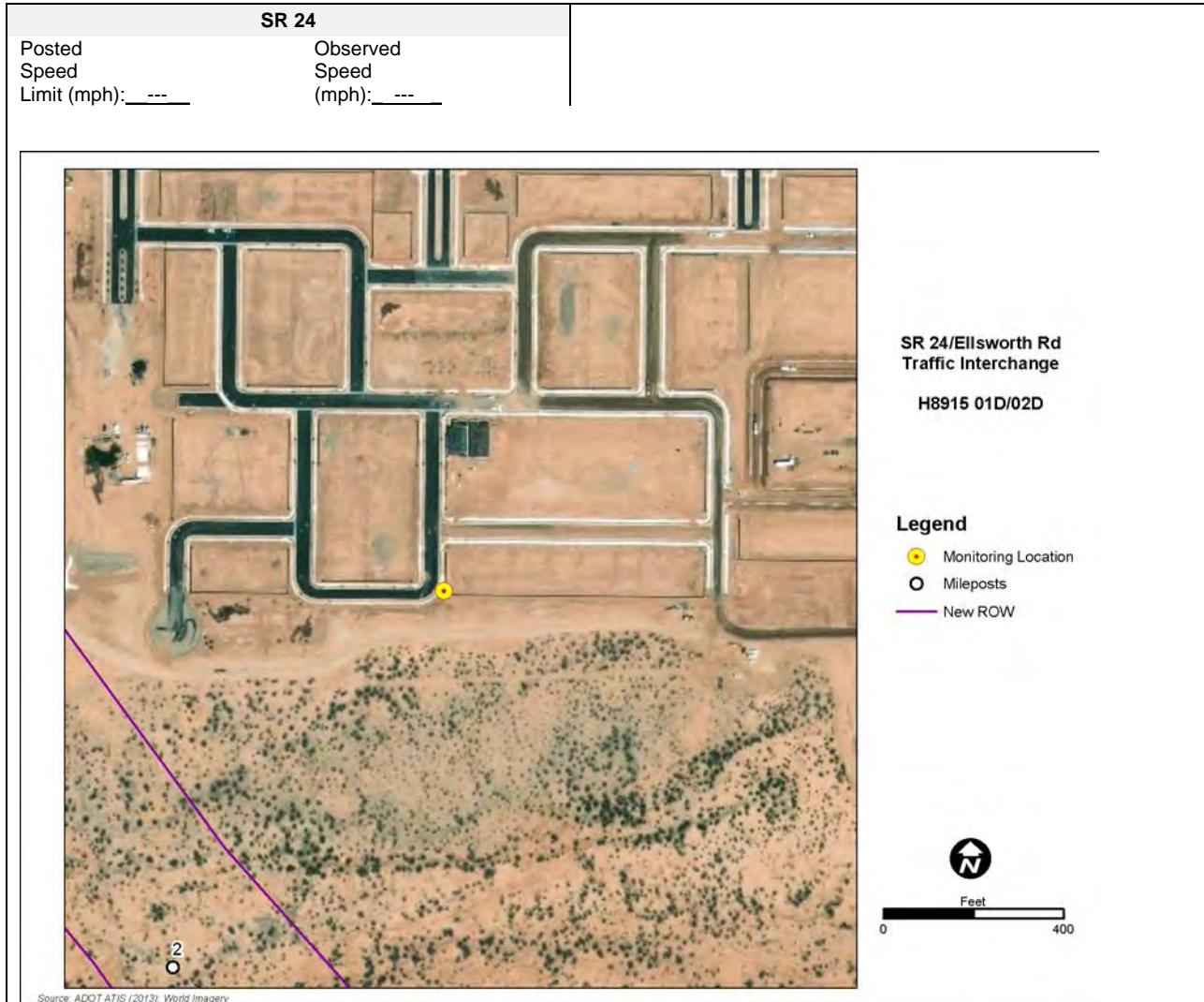
**Site Number/Description:** MON-03, (Lat/Long: 33.313393, -111.626034)  
Corner between Teal Ave and Warren Rd  
(approx. 740 feet to SR24 ROW, at milepost 1.96)

**(Prepared by)/Crew:** David Shu

**Temperature:** 100 °F **Relative Humidity:** 16 % **Wind & Direction:** 6 mph/WSW **Sky:** Fair

**SLM Make/Model:** LDL 824 **Calibration Make/Model:** LDL CA 200 @ 114 dB

**Calibration:**



Sample	Time		Sound Level, dBA			Traffic Count		
	Start	Duration	L <sub>MIN</sub>	L <sub>EQ</sub>	L <sub>MAX</sub>	Auto	Med. Trk.	Hvy. Trk.
1	11:38 AM	10 mins	48.9	53.5	67.6	---	---	---
2	11:49 AM	10 mins	52.8	51.1	69.0	---	---	---
3	12:00 PM	10 mins	45.7	54.9	67.3	---	---	---

**NOTES:** grader working in the distance



Figure 1. Looking west

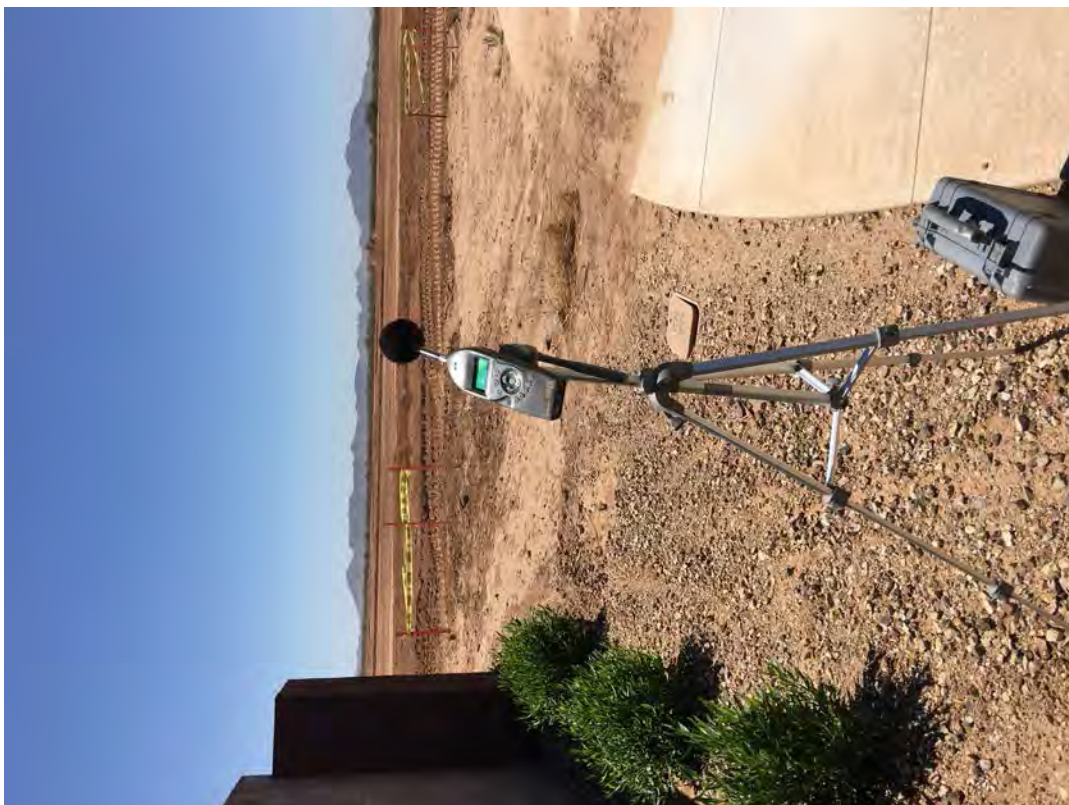


Figure 2. Looking south



4561 E McDowell Road  
 Phoenix, AZ 85008  
 Tel: (602) 454-0402  
 Fax: (602) 458-7465

# ROADWAY TRAFFIC NOISE LEVEL MEASUREMENT DATA SHEET

**Project Number/Name:** SR 24 (H8915 01D/02D)  
Ellsworth Rd Traffic Interchange **Date:** 08/13/2019

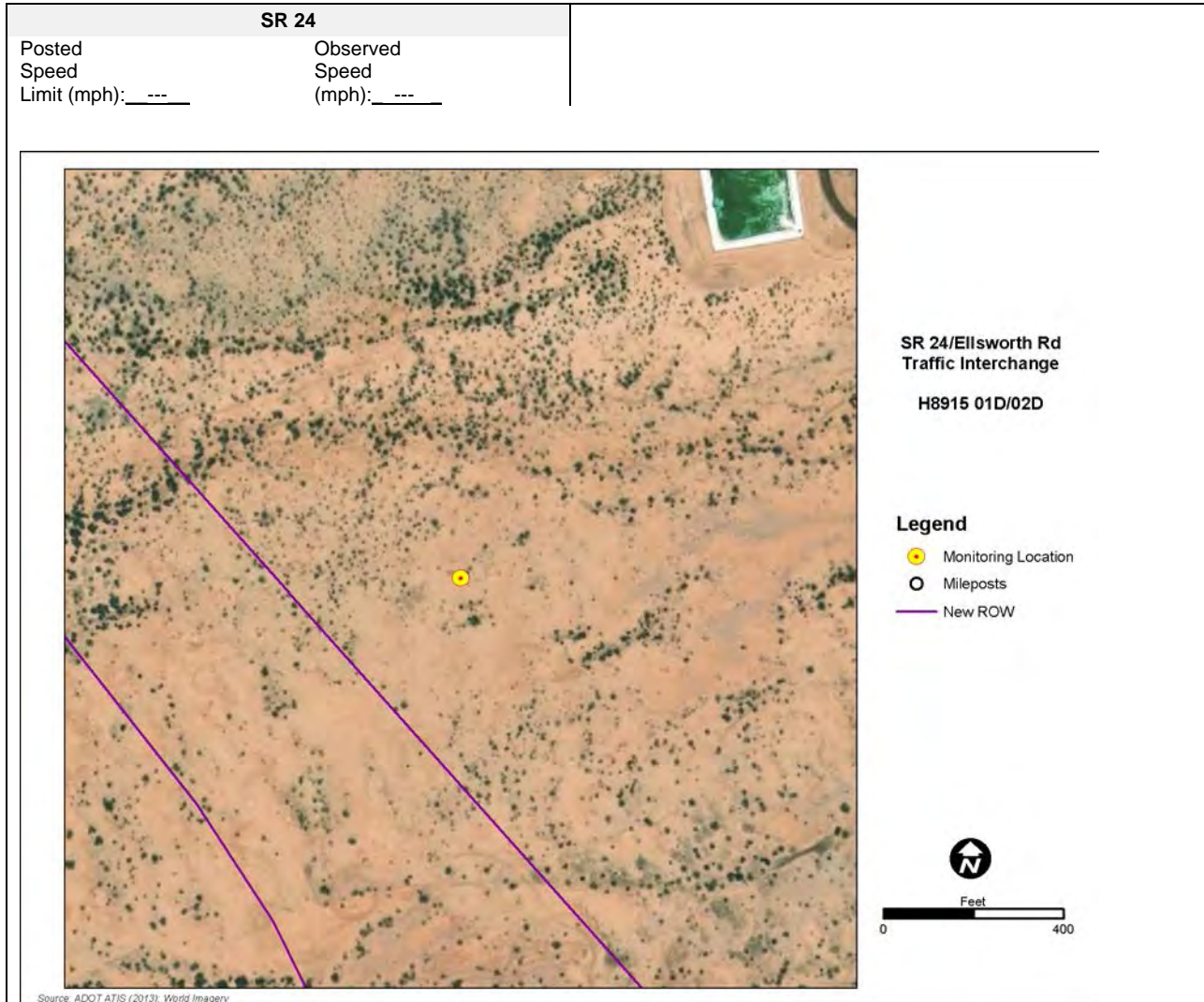
**Site Number/Description:** MON-05, (Lat/Long: 33.310308, -111.624700)  
Undeveloped land (future residential under grading)  
(approx. 300 feet to SR24 ROW, at milepost 2.17)

**(Prepared by)/Crew:** David Shu

**Temperature:** 100 °F **Relative Humidity:** 16 % **Wind & Direction:** 6 mph/WSW **Sky:** Fair

**SLM Make/Model:** LDL 824 **Calibration Make/Model:** LDL CA 200 @ 114 dB

**Calibration:**



Sample	Time		Sound Level, dBA			Traffic Count		
	Start	Duration	L <sub>MIN</sub>	L <sub>EQ</sub>	L <sub>MAX</sub>	Auto	Med. Trk.	Hvy. Trk.
1	12:30 PM	10 mins	40.8	49.3	64.9	---	---	---
2	12:41 PM	10 mins	41.6	46.9	59.2	---	---	---
3	12:52 PM	10 mins	40.8	47.3	62.4	---	---	---

**NOTES:** grader working in the distance



Figure 1. Looking south



Figure 2. Looking west

# Certificate of Calibration and Conformance

Certificate Number 2018-206841

Instrument Model 824, Serial Number A3505, was calibrated on 6 Jun 2018. The instrument meets factory specifications per Procedure D0001.8046, IEC 61672-1:2002 Class 1; IEC 60651-2001, 60804-2000 and ANSI S1.4-1983 Type 1 1/3, 1/1 Oct. Filters; S1.11-1986 Type 1C; IEC61260-am1-2001 Class 1 .

**Instrument found to be in calibration as received: YES**

**Date Calibrated: 6 Jun 2018**

**Calibration due: 6 Jun 2020**

## Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	19 Dec 2018	2017-206126

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

## Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 31 %

## Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.  
Tested with PRM902 S/N 5661

Signed:   
Technician: Sean Childs



# Certificate of Calibration and Conformance

Certificate Number 2018-206840

Instrument Model PRM902, Serial Number 5661, was calibrated on 6 Jun 2018. The instrument meets factory specifications per Procedure D0001.8126.

**Instrument found to be in calibration as received: YES**

**Date Calibrated: 6 Jun 2018**

**Calibration due: 6 Jun 2020**

## Calibration Standards Used

MANUFACTURER	MODEL	SERIAL NUMBER	INTERVAL	CAL. DUE	TRACEABILITY NO.
Agilent Technologies	34401A	MY41038589	12 Months	6 Sep 2018	2017009650
Larson Davis	LDSigGn/2209	0617 / 0104	12 Months	19 Dec 2018	2017-206126

Reference Standards are traceable to the National Institute of Standards and Technology (NIST)

## Calibration Environmental Conditions

Temperature: 24 ° Centigrade

Relative Humidity: 31 %

## Affirmations

This Certificate attests that this instrument has been calibrated under the stated conditions with Measurement and Test Equipment (M&TE) Standards traceable to the U.S. National Institute of Standards and Technology (NIST). All of the Measurement Standards have been calibrated to their manufacturers' specified accuracy / uncertainty. Evidence of traceability and accuracy is on file at Provo Engineering & Manufacturing Center. An acceptable accuracy ratio between the Standard(s) and the item calibrated has been maintained. This instrument meets or exceeds the manufacturer's published specification unless noted.

The collective uncertainty of the Measurement Standard used does not exceed 25% of the applicable tolerance for each characteristic calibrated unless otherwise noted.

The results documented in this certificate relate only to the item(s) calibrated or tested. A one year calibration is recommended, however calibration interval assignment and adjustment are the responsibility of the end user. This certificate may not be reproduced, except in full, without the written approval of the issuer.

"As received" data is the same as shipped data.

Signed:   
Technician: Sean Childs

# ~ Certificate of Calibration and Compliance ~

Microphone Model: 377B02

Serial Number: 305112

Manufacturer: PCB

## Calibration Environmental Conditions

Environmental test conditions as printed on microphone calibration chart.

## Reference Equipment

Manufacturer	Model #	Serial #	PCB Control #	Cal Date	Due Date
National Instruments	PC1e-6351	1896F08	CA1918	10/20/17	10/19/18
Larson Davis	PRM915	134	CA2114	11/30/17	11/30/18
Larson Davis	PRM902	5352	CA1247	4/12/18	4/12/19
Larson Davis	PRM916	130	CA1161	9/13/17	9/13/18
Larson Davis	CAL250	5109	CA1496	10/19/17	10/19/18
Larson Davis	2201	115	TA472	4/12/18	4/12/19
Bruel & Kjaer	4192	2954556	CA2323	9/15/17	9/14/18
Larson Davis	GPRM902	3999	CA1090	9/20/17	9/20/18
Newport	iTHX-SD/N	1080002	CA1511	2/9/18	2/8/19
Larson Davis	PRA951-4	222	LD026	12/19/17	12/19/18
Larson Davis	PRM915	147	CA2179	6/6/17	6/6/18
PCB	68510-02	N/A	CA2672	12/27/17	12/27/18
0	0	0	0	not required	not required
0	0	0	0	not required	not required
0	0	0	0	not required	not required

Frequency sweep performed with B&K UA0033 electrostatic actuator.

## Condition of Unit

As Found: n/a

As Left: New Unit, In Tolerance

## Notes

1. Calibration of reference equipment is traceable to one or more of the following National Labs; NIST, PTB or DFM.
2. This certificate shall not be reproduced, except in full, without written approval from PCB Piezotronics, Inc.
3. Calibration is performed in compliance with ISO 10012-1, ANSI/NCSL Z540.3 and ISO 17025.
4. See Manufacturer's Specification Sheet for a detailed listing of performance specifications.
5. Open Circuit Sensitivity is measured using the insertion voltage method following procedure AT603-5.
6. Measurement uncertainty (95% confidence level with coverage factor of 2) for sensitivity is +/-0.20 dB.
7. Unit calibrated per ACS-20.

Technician: Leonard Lukasik

Date: May 22, 2018



3425 Walden Avenue, Depew, New York, 14043

TEL: 888-684-0013 FAX: 716-685-3886 www.pcb.com

ID.CAL112-3609837065 218+0

# Calibration Certificate

Certificate Number 2018005660

**Customer:**

Aztec Engineering  
4561 East McDowell Road  
Phoenix, AZ 85008, United States

**Model Number** CAL200  
**Serial Number** 5482  
**Test Results** Pass  
**Initial Condition** Adjusted  
**Description** Larson Davis CAL200 Acoustic Calibrator

**Procedure Number** D0001.8386  
**Technician** Scott Montgomery  
**Calibration Date** 6 Jun 2018  
**Calibration Due** 6 Jun 2020  
**Temperature** 23 °C ± 0.3 °C  
**Humidity** 35 %RH ± 3 %RH  
**Static Pressure** 101.2 kPa ± 1 kPa

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

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

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

The quality system is registered to ISO 9001:2008.

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

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

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the organization issuing this report.

## Standards Used

Description	Cal Date	Cal Due	Cal Standard
Agilent 34401A DMM	09/06/2017	09/06/2018	001021
Larson Davis Model 2900 Real Time Analyzer	04/10/2018	04/10/2019	001051
Microphone Calibration System	03/07/2018	03/07/2019	005446
1/2" Preamplifier	10/05/2017	10/05/2018	006506
Larson Davis 1/2" Preamplifier 7-pin LEMO	08/08/2017	08/08/2018	006507
1/2 inch Microphone - RI - 200V	10/23/2017	10/23/2018	006511
Pressure Transducer	10/20/2017	10/20/2018	007204

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



## Output Level

Nominal Level [dB]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
114	101.2	114.01	113.80	114.20	0.14	Pass
94	101.2	93.99	93.80	94.20	0.14	Pass

-- End of measurement results--

## Frequency

Nominal Level [dB]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
114	101.2	1,000.04	990.00	1,010.00	0.20	Pass
94	101.2	1,000.04	990.00	1,010.00	0.20	Pass

-- End of measurement results--

## Total Harmonic Distortion + Noise (THD+N)

Nominal Level [dB]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
114	101.2	0.54	0.00	2.00	0.25	Pass
94	101.2	0.55	0.00	2.00	0.25	Pass

-- End of measurement results--

## Level Change Over Pressure

Tested at: 114 dB, 24 °C, 31 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [dB]	Lower limit [dB]	Upper limit [dB]	Expanded Uncertainty [dB]	Result
108.0	107.9	-0.02	-0.30	0.30	0.04 ‡	Pass
101.3	101.3	0.00	-0.30	0.30	0.04 ‡	Pass
92.0	92.0	0.03	-0.30	0.30	0.04 ‡	Pass
83.0	83.1	0.06	-0.30	0.30	0.04 ‡	Pass
74.0	74.0	0.10	-0.30	0.30	0.04 ‡	Pass
65.0	65.1	0.15	-0.30	0.30	0.04 ‡	Pass

-- End of measurement results--

## Frequency Change Over Pressure

Tested at: 114 dB, 24 °C, 31 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [Hz]	Lower limit [Hz]	Upper limit [Hz]	Expanded Uncertainty [Hz]	Result
108.0	107.9	0.00	-10.00	10.00	0.20 ‡	Pass
101.3	101.3	0.00	-10.00	10.00	0.20 ‡	Pass
92.0	92.0	0.00	-10.00	10.00	0.20 ‡	Pass
83.0	83.1	0.00	-10.00	10.00	0.20 ‡	Pass
74.0	74.0	0.00	-10.00	10.00	0.20 ‡	Pass
65.0	65.1	0.00	-10.00	10.00	0.20 ‡	Pass

-- End of measurement results--

**Total Harmonic Distortion + Noise (THD+N) Over Pressure**

Tested at: 114 dB, 24 °C, 31 %RH

Nominal Pressure [kPa]	Pressure [kPa]	Test Result [%]	Lower limit [%]	Upper limit [%]	Expanded Uncertainty [%]	Result
108.0	107.9	0.58	0.00	2.00	0.25 ‡	Pass
101.3	101.3	0.55	0.00	2.00	0.25 ‡	Pass
92.0	92.0	0.52	0.00	2.00	0.25 ‡	Pass
83.0	83.1	0.49	0.00	2.00	0.25 ‡	Pass
74.0	74.0	0.46	0.00	2.00	0.25 ‡	Pass
65.0	65.1	0.44	0.00	2.00	0.25 ‡	Pass

-- End of measurement results--

Signatory: Scott Montgomery

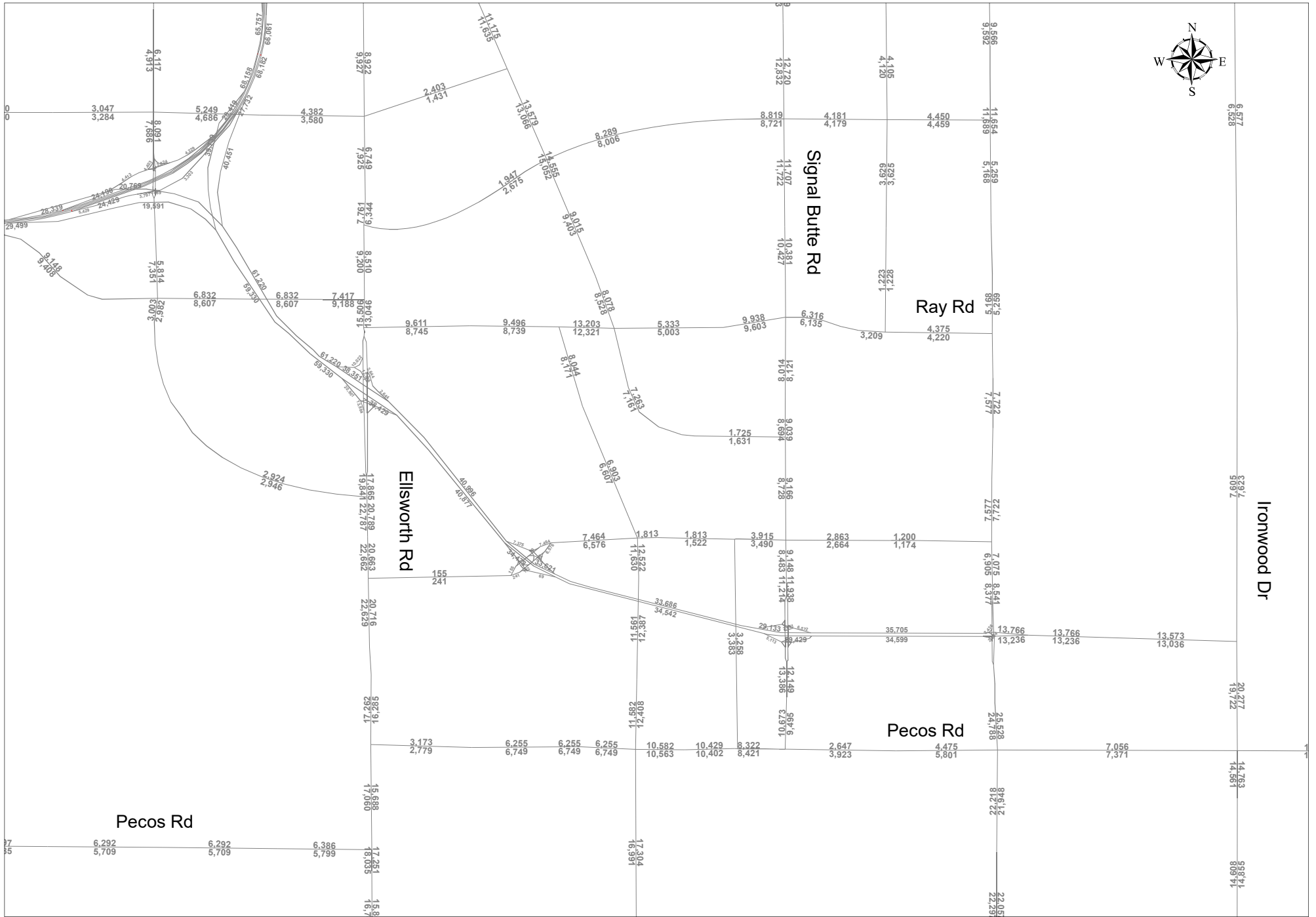
Larson Davis, a division of PCB Piezotronics, Inc  
 1681 West 820 North  
 Provo, UT 84601, United States  
 716-684-0001



# **APPENDIX C**

## **Future Traffic Volumes**

# 2040 Average Weekday Daily Traffic



**SR24, Ellsworth Road - Ironwood Drive (2040 Ultimate Build)**

**Tracs No. 024 MA 001 H8915 01D/02D**

Roadway Segment	AADT	10% of AADT	Auto%	MT%	HT%
SR24 WB West of Ellsworth Rd	61,220	6,122	94.7%	3.5%	1.8%
SR24 EB West of Ellsworth Rd	59,330	5,933	94.6%	3.6%	1.8%
SR24 WB Over Ellsworth Rd	38,351	3,835	94.4%	3.7%	1.9%
SR24 EB Over Ellsworth Rd	38,429	3,843	94.5%	3.6%	1.9%
SR24 WB East of Ellsworth Rd	40,996	4,100	94.8%	3.4%	1.8%
SR24 EB East of Ellsworth Rd	40,877	4,088	94.8%	3.4%	1.8%
Ellsworth Rd WB On-Ramp	22,868	2,287	95.5%	3.1%	1.4%
Ellsworth Rd WB Off-Ramp	2,644	264	97.8%	1.5%	0.7%
Ellsworth Rd EB Off-Ramp	20,901	2,090	95.1%	3.3%	1.6%
Ellsworth Rd EB On-Ramp	2,448	245	97.8%	1.5%	0.7%
Ramp 'N-E'	40,451	4,045	94.3%	3.7%	2.0%
Ellsworth Rd NB	13,046	1,305	95.7%	3.0%	1.3%
Ellsworth Rd SB	15,506	1,551	98.0%	1.4%	0.6%
SR24 WB Over Williams Field Rd	33,621	3,362	94.2%	3.7%	2.1%
SR24 EB Over Williams Field Rd	34,473	3,447	94.2%	3.7%	2.1%
Williams Field Rd WB On-Ramp	7,375	738	97.0%	2.5%	0.5%
Williams Field Rd WB Off-Ramp	65	7	98.7%	1.0%	0.3%
Williams Field Rd EB Off-Ramp	6,404	640	97.0%	2.5%	0.5%
Williams Field Rd EB On-Ramp	69	7	98.4%	1.0%	0.5%

\* Column [AADT] volumes are derived from SR24 DCR Traffic Analysis Report, dated 2017-09-18 for 2040 Build Condition

\* Columns [Auto%], [MT%], and [HT%] are calculated from MAG traffic model, provided by MAG on 2019-08-19



**SR24, Ellsworth Road - Ironwood Drive (2025 Interim Build)**

**Tracs No. 024 MA 001 H8915 01D/02D**

Roadway Segment	AADT	24H Car	24H Med	24H HEA	10% 24H Car	10% 24H Med	10% 24H HEA	Auto%	MT%	HT%
SR24 WB West of Ellsworth Rd	37,281	35,780	1,023	478	3,578	102	48	96.0%	2.7%	1.3%
SR24 EB West of Ellsworth Rd	34,586	33,221	934	431	3,322	93	43	96.1%	2.7%	1.2%
SR24 WB Over Ellsworth Rd	13,224	12,763	327	134	1,276	33	13	96.5%	2.5%	1.0%
SR24 EB Over Ellsworth Rd	13,306	12,853	322	131	1,285	32	13	96.6%	2.4%	1.0%
SR24 WB East of Ellsworth Rd	13,312	12,841	333	138	1,284	33	14	96.5%	2.5%	1.0%
SR24 EB East of Ellsworth Rd	13,355	12,897	325	133	1,290	33	13	96.6%	2.4%	1.0%
Ellsworth Rd WB On-Ramp	24,056	23,017	696	343	2,302	70	34	95.7%	2.9%	1.4%
Ellsworth Rd WB Off-Ramp	88	79	6	3	8	1	0	89.8%	6.8%	3.4%
Ellsworth Rd EB Off-Ramp	21,280	20,369	612	299	2,037	61	30	95.7%	2.9%	1.4%
Ellsworth Rd EB On-Ramp	48	44	3	1	4	0	0	91.7%	6.3%	2.1%
Ellsworth Rd NB	21,128	20,434	496	198	2,043	50	20	96.7%	2.3%	0.9%
Ellsworth Rd SB	12,348	11,777	371	200	1,178	37	20	95.4%	3.0%	1.6%
SR24 WB near Williams Field Rd	13,312	12,841	333	138	1,284	33	14	96.5%	2.5%	1.0%
SR24 EB near Williams Field Rd	13,355	12,897	325	133	1,290	33	13	96.6%	2.4%	1.0%

\* Columns [AADT], [Auto%], [MT%], and [HT%] are provided and calculated from MAG traffic model, provided by MAG on 2019-08-19 for 2025 Interim Condition

# **APPENDIX D**

## **Predicted Noise Levels**

SR 24, ELLSWORTH ROAD - IRONWOOD DRIVE TRACS NO. 024 MA 001 H8915 01D/02D									
Noise Receiver				Noise Level (Leq), dBA					Mitigation Considerations
ID	Receiver Description	NAC Category	Represented Receptors	Noise Level Measurement	TNM 2.5 Model			Insertion Loss	
					2025 Interim Build	2040 Ultimate Build	Future Build (Mitigated)		
<b>SECTION 1, SR 24 WB Side between Ellsworth Rd and Williams Field Rd</b>									
R1	Future commercial	E	10	---	54	60	---	---	No impact for NAC B and E
R2/Mon1	Future commercial	E	10	53	52	59	---	---	
R3	Future multi-family	B <sup>[1]</sup>	10	---	52	59	---	---	
R4	Future multi-family	B <sup>[1]</sup>	10	---	52	60	---	---	
R5	Future residential development	B <sup>[1]</sup>	10	---	51	60	---	---	
R6/Mon2	Future residential development	B <sup>[1]</sup>	10	59	51	61	---	---	
R7	Future residential development	B <sup>[1]</sup>	10	---	52	62	---	---	
R8	Exist single family home	B	4	---	47	54	---	---	
R9	Exist single family home	B	4	---	47	55	---	---	
R10	Exist single family home	B	4	---	49	57	---	---	
R11	Exist single family home	B	2	---	49	58	---	---	
R12	Exist single family home	B	3	---	48	57	---	---	
R13	Exist single family home	B	4	---	47	56	---	---	
R14/Mon3	Exist single family home	B	3	53	45	53	---	---	
R15	Exist single family home	B	4	---	48	56	---	---	
R16	Exist single family home	B	4	---	49	58	---	---	
R17	Future residential development	B <sup>[1]</sup>	10	N/A	52	62	---	---	
R18/Mon4	Future residential development	B <sup>[1]</sup>	10	---	52	62	---	---	
R19	Future residential development	B <sup>[1]</sup>	10	---	52	61	---	---	
R20/Mon5	Future residential development	B <sup>[1]</sup>	10	48	51	61	---	---	
R21	Future residential development	B <sup>[1]</sup>	10	---	51	62	---	---	
R22	Future residential development	B <sup>[1]</sup>	10	---	51	62	---	---	
R23	Future residential development	B <sup>[1]</sup>	10	---	51	62	---	---	

Note:

[1]. Undeveloped lands permitted for this activity category

## **APPENDIX E**

**FHWA Traffic Noise Model (TNM) 2.5 Output Tables  
(TNM Model to EP)**

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

AZTEC Engineering				30 August 2019								
AZTEC Engineering				TNM 2.5								
INPUT: ROADWAYS				Average pavement type shall be used unless								
PROJECT/CONTRACT: SR24 Ellsworth Rd - Ironwood Rd				a State highway agency substantiates the use								
RUN: SR24, 2025 Interim Condition				of a different type with the approval of FHWA								
Roadway		Points										
Name	Width	Name	No.	Coordinates (pavement)			Flow Control			Segment		
				X	Y	Z	Control	Speed	Percent	Pvmt	On	
							Device	Constraint	Vehicles	Type	Struct?	
									Affected			
	ft			ft	ft	ft		mph	%			
Ellsworth RampA	12.0	27+42.33	440	786,016.7	843,575.2	1,389.30	Onramp	10.00	100	Average		
		26+00.00	439	785,878.5	843,609.4	1,387.70				Average		
		24+00.00	438	785,684.3	843,657.4	1,385.90				Average		
		22+00.00	437	785,490.2	843,705.4	1,386.40				Average		
		20+00.00	436	785,296.0	843,753.4	1,387.20				Average		
		18+00.00	435	785,104.4	843,809.9	1,388.80				Average		
		16+00.00	434	784,924.9	843,897.5	1,393.80				Average		
		14+00.00	433	784,761.4	844,012.6	1,400.70				Average		
		12+00.00	432	784,601.4	844,132.5	1,406.00				Average		
		10+00.00	431	784,441.3	844,252.4	1,408.80				Average		
		8+00.00	430	784,282.3	844,373.8	1,409.00				Average		
		6+00.00	429	784,128.9	844,502.0	1,409.30				Average		
		4+00.00	428	783,981.8	844,637.5	1,408.30				Average		
		2+00.00	427	783,841.3	844,779.9	1,407.30				Average		
		0+00.00	426	783,723.5	844,899.2	1,406.30						
Ellsworth RampB	12.0	0+00.00	441	783,967.4	844,468.9	1,408.90				Average		
		2+00.00	442	784,100.5	844,310.8	1,409.80				Average		
		4+00.00	443	784,241.0	844,168.5	1,410.80				Average		
		6+00.00	444	784,386.2	844,031.0	1,414.10				Average		
		8+00.00	445	784,532.9	843,895.0	1,414.10				Average		
		10+00.00	446	784,679.5	843,758.9	1,411.80				Average		
		12+00.00	447	784,826.1	843,622.9	1,407.10				Average		
		14+00.00	448	784,972.7	843,486.9	1,400.60				Average		
		16+00.00	449	785,119.3	843,350.9	1,393.90				Average		
		18+00.00	450	785,266.0	843,214.8	1,387.20				Average		
		20+00.00	451	785,421.2	843,089.1	1,380.60						
Ellsworth RampC	12.0	27+57.73	470	787,868.8	841,653.8	1,397.20				Average		

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		26+00.00	469	787,771.7	841,778.1	1,396.50				Average
		24+00.00	468	787,648.6	841,935.7	1,395.50				Average
		22+00.00	467	787,525.5	842,093.3	1,394.50				Average
		20+00.00	466	787,402.3	842,250.9	1,396.00				Average
		18+00.00	465	787,279.5	842,408.7	1,395.50				Average
		16+00.00	464	787,162.7	842,571.0	1,394.60				Average
		14+00.00	463	787,054.6	842,739.3	1,393.40				Average
		12+00.00	462	786,951.1	842,910.4	1,392.30				Average
		10+00.00	461	786,847.7	843,081.6	1,391.20				Average
		8+00.00	460	786,727.3	843,240.8	1,390.10				Average
		7+00.00	1291	786,651.9	843,306.1	1,389.50				
Ellsworth RampD	12.0	0+00.00	471	786,030.6	842,860.3	1,387.50	Onramp	10.00	100	Average
		2+00.00	472	786,224.7	842,812.3	1,386.30				Average
		4+00.00	473	786,410.8	842,740.3	1,387.00				Average
		6+00.00	474	786,576.2	842,628.6	1,390.50				Average
		8+00.00	475	786,731.6	842,502.7	1,393.60				Average
		10+00.00	476	786,887.1	842,376.8	1,394.00				Average
		12+00.00	477	787,042.5	842,250.9	1,391.90				Average
		14+00.00	478	787,196.8	842,123.8	1,391.30				Average
		16+00.00	479	787,345.5	841,990.0	1,392.30				Average
		18+00.00	480	787,487.6	841,849.3	1,395.30				Average
		20+00.00	481	787,622.8	841,701.9	1,396.30				Average
		22+00.00	482	787,749.3	841,564.9	1,397.30				
WilliamField_RampA	24.0	20+93.48	1005	790,134.0	839,044.9	1,398.50				Average
		20+00.00	1004	790,069.0	839,112.1	1,398.50				Average
		18+00.00	1003	789,930.0	839,255.9	1,397.80				Average
		16+00.00	1002	789,790.9	839,399.7	1,398.60				Average
		14+00.00	1001	789,651.9	839,543.5	1,400.00				Average
		12+00.00	1000	789,512.9	839,687.2	1,401.10				Average
		10+00.00	999	789,373.9	839,831.0	1,400.30				Average
		8+00.00	998	789,234.9	839,974.8	1,397.70				Average
		6+00.00	997	789,097.6	840,120.2	1,396.10				Average
		4+00.00	996	788,964.2	840,269.2	1,396.60				Average
		2+00.00	995	788,834.8	840,421.8	1,397.30				Average
		0+00.00	994	788,709.6	840,577.7	1,398.30				
WilliamField_RampB	24.0	0+00.00	1006	788,444.8	840,688.4	1,399.60				Average
		2+00.00	1007	788,561.6	840,526.2	1,398.60				Average
		4+00.00	1008	788,679.1	840,364.4	1,397.60				Average
		6+00.00	1009	788,792.9	840,199.9	1,396.70				Average
		8+00.00	1010	788,902.8	840,032.8	1,395.60				Average

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		10+00.00	1011	789,008.8	839,863.2	1,396.30				Average
		12+00.00	1012	789,111.2	839,691.4	1,398.00				Average
		14+00.00	1013	789,213.0	839,519.3	1,398.80				Average
		16+00.00	1014	789,319.3	839,350.0	1,397.40				
WilliamField_RampC	24.0	26+85.87	1033	792,228.1	837,401.5	1,407.80				Average
		26+00.00	1032	792,150.7	837,438.6	1,407.30				Average
		24+00.00	1031	791,972.5	837,529.3	1,406.30				Average
		22+00.00	1030	791,797.5	837,626.2	1,405.30				Average
		20+00.00	1029	791,626.1	837,729.2	1,404.30				Average
		18+00.00	1028	791,458.3	837,838.0	1,403.30				Average
		16+00.00	1027	791,294.5	837,952.7	1,401.20				Average
		14+00.00	1026	791,134.7	838,073.0	1,401.80				Average
		12+00.00	1025	790,979.2	838,198.8	1,404.00				Average
		10+00.00	1024	790,828.3	838,330.0	1,405.40				Average
		8+00.00	1023	790,682.0	838,466.3	1,404.20				Average
		point1304	1304	790,611.2	838,537.0	1,403.00				
WilliamField_RampD	24.0	0+00.00	1034	789,763.2	838,839.1	1,396.70				Average
		2+00.00	1035	789,902.3	838,695.3	1,398.20				Average
		4+00.00	1036	790,041.3	838,551.6	1,396.80				Average
		6+00.00	1037	790,186.3	838,413.9	1,397.30				Average
		8+00.00	1038	790,340.5	838,286.5	1,398.50				Average
		10+00.00	1039	790,503.2	838,170.3	1,399.70				Average
		12+00.00	1040	790,673.6	838,065.7	1,400.90				Average
		14+00.00	1041	790,849.1	837,969.8	1,402.00				Average
		16+00.00	1042	791,024.8	837,874.3	1,403.10				Average
		18+00.00	1043	791,200.5	837,778.8	1,403.90				Average
		20+00.00	1044	791,376.3	837,683.2	1,403.40				Average
		22+00.00	1045	791,552.0	837,587.7	1,404.30				Average
		24+00.00	1046	791,727.7	837,492.2	1,405.30				Average
		24+33.79	1047	791,757.4	837,476.1	1,405.50				
Ellsworth Rd NB	60.0	0+00.00	1119	786,054.1	843,564.6	1,388.00				Average
		1+75.77	1120	786,057.3	843,390.3	1,387.50				Average
		3+39.37	1121	786,060.5	843,226.7	1,387.00				Average
		5+87.48	1122	786,065.3	842,978.7	1,386.50				Average
		7+15.02	1123	786,067.8	842,851.1	1,386.60				
Ellsworth Rd SB	60.0	0+00.00	1124	785,993.3	842,869.6	1,386.50				Average
		1+59.42	1125	785,990.3	843,029.0	1,386.60				Average
		4+04.24	1126	785,985.5	843,273.7	1,387.30				Average
		5+60.60	1127	785,982.5	843,430.1	1,387.70				Average
		7+14.91	1128	785,979.7	843,583.7	1,388.30				

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

SR24_EB_1st_GPLane_3	12.0	86+03.05	1197	787,756.6	841,570.0	1,397.20				Average
		88+00.00	674	787,877.9	841,414.9	1,398.20				Average
		92+00.00	675	788,124.1	841,099.6	1,400.00				Average
		96+00.00	676	788,370.4	840,784.4	1,400.00				Average
		100+00.00	677	788,440.2	840,685.0	1,399.60				
SR24_EB_2nd_GPLane_3	12.0	86+04.38	1198	787,766.9	841,576.4	1,397.20				Average
		88+00.00	589	787,887.3	841,422.2	1,398.20				Average
		92+00.00	590	788,133.6	841,107.0	1,400.00				Average
		96+00.00	591	788,379.8	840,791.8	1,400.00				Average
		100+00.00	592	788,452.0	840,691.8	1,399.60				
SR24_EB_2nd_GPLane_1	12.0	28+01.70	1268	783,331.1	845,241.1	1,404.00				Average
		30+00.21	1167	783,450.6	845,080.7	1,404.90				Average
		31+98.72	1168	783,575.6	844,924.6	1,405.90				Average
		33+97.23	1169	783,705.9	844,772.9	1,406.90				Average
		35+95.74	1170	783,841.3	844,625.7	1,407.90				Average
		37+94.25	1171	783,981.8	844,483.4	1,408.80				
SR24_EB_1st_GPLane_1	12.0	28+00.87	1269	783,320.9	845,234.8	1,404.00				Average
		29+98.97	1134	783,440.3	845,074.4	1,404.90				Average
		31+97.07	1135	783,565.3	844,918.2	1,405.90				Average
		33+95.17	1136	783,695.5	844,766.4	1,406.90				Average
		35+93.27	1137	783,830.9	844,619.3	1,407.80				Average
		37+91.36	1138	783,971.3	844,476.9	1,408.80				
SR24_WB_1st_GPLane_3	12.0	100+00.00	1272	788,714.3	840,581.9	1,398.30				Average
		96+00.00	278	788,476.0	840,866.9	1,400.00				Average
		92+00.00	277	788,229.7	841,182.1	1,400.00				Average
		88+00.00	276	787,983.4	841,497.4	1,398.20				Average
		86+00.00	1285	787,858.1	841,654.8	1,397.20				
SR24_WB_2nd_GPLane_3	12.0	100+00.00	1273	788,703.9	840,572.4	1,398.30				Average
		96+00.00	363	788,466.5	840,859.6	1,400.00				Average
		92+00.00	362	788,220.3	841,174.8	1,400.00				Average
		88+00.00	361	787,974.0	841,490.0	1,398.20				Average
		86+00.00	1286	787,848.8	841,647.2	1,397.20				
SR24_WB_1st_GPLane_1	12.0	point1280	1280	783,714.7	844,894.6	1,406.50				Average
		32+10.72	1235	783,649.4	844,970.3	1,406.00				Average
		30+09.21	1234	783,524.1	845,126.2	1,405.00				Average
		28+07.70	1233	783,404.5	845,286.4	1,404.00				
SR24_WB_2nd_GPLane_1	12.0	point1281	1281	783,704.4	844,888.2	1,406.45				Average
		32+09.03	1206	783,639.1	844,963.9	1,406.00				Average
		30+07.94	1205	783,513.9	845,119.9	1,405.00				Average
		28+06.85	1204	783,394.2	845,280.1	1,404.00				



**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

SR24_EB_2nd_GPLane_2	12.0	point1282	1282	783,981.8	844,483.4	1,408.80				Average	
		39+92.76	1172	784,127.1	844,346.0	1,409.80				Average	
		41+91.27	1173	784,277.1	844,213.7	1,410.80				Average	
		43+89.78	1174	784,431.6	844,086.7	1,411.70				Average	
		45+88.35	1175	784,590.5	843,965.1	1,412.70				Average	
		47+86.86	1176	784,753.4	843,849.1	1,413.70				Average	
		49+85.37	1177	784,920.2	843,738.9	1,414.70				Average	
		51+84.18	1178	785,090.4	843,633.8	1,415.60				Average	
		53+84.17	1179	785,261.2	843,529.7	1,416.60				Average	
		55+84.17	1180	785,431.9	843,425.6	1,417.60				Average	
		57+84.16	1181	785,602.7	843,321.4	1,418.50				Average	
		59+84.15	1182	785,773.4	843,217.3	1,418.20				Average	
		61+84.14	1183	785,944.2	843,113.1	1,416.30				Average	Y
		63+84.14	1184	786,114.9	843,009.0	1,412.80				Average	Y
		65+85.00	1185	786,285.6	842,904.8	1,407.70				Average	
		67+86.94	1186	786,453.7	842,796.4	1,402.20				Average	
		69+88.87	1187	786,617.9	842,682.2	1,397.30				Average	
		71+90.81	1188	786,778.0	842,562.3	1,393.90				Average	
		73+92.75	1189	786,933.7	842,436.9	1,392.20				Average	
		75+94.69	1190	787,084.9	842,306.0	1,392.20				Average	
		77+96.63	1191	787,231.4	842,169.9	1,393.20				Average	
		79+98.57	1192	787,373.1	842,028.7	1,394.20				Average	
		82+00.50	1193	787,509.6	841,882.6	1,395.20				Average	
		84+02.44	1194	787,641.0	841,731.7	1,396.20				Average	
		86+04.38	1195	787,766.9	841,576.4	1,397.20					
SR24_EB_1st_GPLane_2	12.0	point1283	1283	783,971.3	844,476.9	1,408.80				Average	
		39+89.46	1139	784,116.6	844,339.4	1,409.80				Average	
		41+87.56	1140	784,266.5	844,207.0	1,410.80				Average	
		43+85.66	1141	784,420.9	844,079.9	1,411.70				Average	
		45+83.82	1142	784,579.7	843,958.2	1,412.70				Average	
		47+81.92	1143	784,742.5	843,842.1	1,413.70				Average	
		49+80.02	1144	784,909.2	843,731.6	1,414.60				Average	
		51+78.44	1145	785,079.4	843,626.5	1,415.60				Average	
		53+78.44	1146	785,250.1	843,522.4	1,416.60				Average	
		55+78.43	1147	785,420.9	843,418.2	1,417.60				Average	
		57+78.42	1148	785,591.6	843,314.1	1,418.50				Average	
		59+78.41	1149	785,762.4	843,210.0	1,418.20				Average	
		61+78.41	1150	785,933.1	843,105.8	1,416.40				Average	Y
		63+78.40	1151	786,103.9	843,001.7	1,412.90				Average	Y
		65+79.38	1152	786,274.6	842,897.5	1,407.90				Average	

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		67+81.75	1153	786,442.8	842,789.3	1,402.40				Average
		69+84.12	1154	786,607.1	842,675.3	1,397.40				Average
		71+86.48	1155	786,767.2	842,555.5	1,394.00				Average
		73+88.85	1156	786,923.1	842,430.1	1,392.30				Average
		75+91.22	1157	787,074.4	842,299.4	1,392.20				Average
		77+93.58	1158	787,220.9	842,163.3	1,393.20				Average
		79+95.95	1159	787,362.6	842,022.2	1,394.20				Average
		81+98.31	1160	787,499.3	841,876.1	1,395.20				Average
		84+00.68	1161	787,630.6	841,725.4	1,396.20				Average
		86+03.05	1162	787,756.6	841,570.0	1,397.20				
Ellsworth RampC_ZOI(2)	12.0	1+00.00	1292	786,210.8	843,527.2	1,387.50				Average
		2+00.00	1289	786,113.8	843,551.2	1,388.40				
Ellsworth RampC_ZOI(1)	12.0	7+00.00	1293	786,651.9	843,306.1	1,389.50				Average
		6+00.00	459	786,576.4	843,371.5	1,388.90				Average
		4+00.00	458	786,401.6	843,467.9	1,387.80				Average
		2+00.00	457	786,210.8	843,527.2	1,387.50				
Ellsworth RampB_ZOI(2)	12.0	25+00.00	1296	785,879.6	842,897.9	1,385.45				Average
		26+00.00	454	785,976.7	842,873.7	1,385.80				
Ellsworth RampB_ZOI(1)	12.0	20+00.00	1297	785,421.2	843,089.1	1,380.60				Average
		22+00.00	452	785,595.0	842,990.5	1,382.30				Average
		24+00.00	453	785,782.6	842,922.0	1,385.10				Average
		25+00.00	1295	785,879.6	842,897.9	1,385.45				
WilliamField_RampB_ZOI(1)	24.0	point1302	1302	789,319.3	839,350.0	1,397.40				Average
		18+00.00	1015	789,442.1	839,192.2	1,396.00				Average
		20+00.00	1016	789,578.9	839,046.4	1,397.00				Average
		21+00.00	1301	789,648.4	838,974.5	1,396.75				
WilliamField_RampC_ZOI(2)	24.0	point1303	1303	790,262.5	838,895.3	1,398.50				Average
		1+00.00	1298	790,193.0	838,967.2	1,398.50				
WilliamField_RampC_ZOI(1)	24.0	point1305	1305	790,611.2	838,537.0	1,403.00				Average
		6+00.00	1022	790,540.5	838,607.7	1,401.80				Average
		4+00.00	1021	790,401.5	838,751.5	1,399.30				Average
		2+00.00	1020	790,262.5	838,895.3	1,398.50				
SR24_WB_1st_GPLane_2	12.0	point1287	1287	787,858.1	841,654.8	1,397.20				Average
		84+00.00	275	787,732.8	841,812.1	1,396.20				Average
		80+00.00	274	787,461.7	842,112.5	1,394.20				Average
		78+60.68	1259	787,362.5	842,212.6	1,393.50				Average
		78+11.29	1258	787,326.7	842,247.5	1,393.30				Average
		76+13.60	1257	787,180.6	842,384.0	1,392.30				Average
		74+15.91	1256	787,029.2	842,514.7	1,392.20				Average
		72+18.17	1255	786,871.4	842,637.5	1,393.60				Average

INPUT: ROADWAYS

SR24 Ellsworth Rd - Ironwood Rd

		70+20.34	1254	786,707.3	842,751.8	1,396.70				Average	
		68+22.33	1253	786,537.5	842,857.4	1,401.30				Average	
		66+23.82	1252	786,365.7	842,959.9	1,406.70				Average	
		64+24.58	1251	786,193.9	843,062.3	1,411.90				Average	
		63+24.58	1275	786,108.0	843,113.6	1,413.80				Average	Y
		62+24.58	1250	786,022.2	843,164.8	1,415.70				Average	Y
		61+24.58	1274	785,936.2	843,216.0	1,416.85				Average	Y
		60+24.58	1249	785,850.4	843,267.2	1,418.00				Average	
		58+24.58	1248	785,678.6	843,369.7	1,418.60				Average	
		56+24.58	1247	785,506.9	843,472.1	1,417.80				Average	
		54+24.58	1246	785,335.1	843,574.6	1,416.80				Average	
		52+24.58	1245	785,163.5	843,677.4	1,415.80				Average	
		50+23.90	1244	784,994.5	843,784.3	1,414.90				Average	
		48+22.64	1243	784,828.9	843,896.3	1,413.90				Average	
		46+21.25	1242	784,666.7	844,013.3	1,412.90				Average	
		44+19.79	1241	784,508.1	844,135.2	1,411.90				Average	
		42+18.29	1240	784,353.3	844,261.9	1,410.90				Average	
		40+16.77	1239	784,202.8	844,393.5	1,409.90				Average	
		38+15.26	1238	784,056.9	844,530.3	1,408.90				Average	
		36+13.75	1237	783,915.9	844,672.2	1,407.90				Average	
		34+12.24	1236	783,780.0	844,818.9	1,407.00				Average	
		33+11	1278	783,714.7	844,894.6	1,406.50					
SR24_WB_2nd_GPLane_2	12.0	point1288	1288	787,848.8	841,647.2	1,397.20				Average	
		84+00.00	360	787,723.6	841,804.4	1,396.20				Average	
		80+00.00	359	787,453.1	842,104.1	1,394.20				Average	
		78+60.68	1230	787,354.1	842,204.0	1,393.50				Average	
		78+08.34	1229	787,316.2	842,240.9	1,393.20				Average	
		76+10.24	1228	787,170.0	842,377.4	1,392.30				Average	
		74+12.14	1227	787,018.6	842,508.0	1,392.20				Average	
		72+13.99	1226	786,860.5	842,630.5	1,393.70				Average	
		70+15.74	1225	786,696.3	842,744.6	1,396.70				Average	
		68+17.32	1224	786,526.4	842,850.1	1,401.40				Average	
		66+18.37	1223	786,354.6	842,952.5	1,406.80				Average	
		64+18.84	1222	786,182.9	843,055.0	1,412.00				Average	
		63+18.84	1277	786,097.0	843,106.2	1,413.90				Average	Y
		62+18.84	1221	786,011.1	843,157.4	1,415.80				Average	Y
		61+18.84	1276	785,925.2	843,208.6	1,416.90				Average	Y
		60+18.84	1220	785,839.3	843,259.9	1,418.00				Average	
		58+18.84	1219	785,667.5	843,362.3	1,418.60				Average	
		56+18.84	1218	785,495.8	843,464.7	1,417.80				Average	

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		54+18.84	1217	785,324.0	843,567.2	1,416.80				Average	
		52+18.84	1216	785,152.5	843,670.0	1,415.80				Average	
		50+18.40	1215	784,983.6	843,777.1	1,414.80				Average	
		48+17.55	1214	784,818.0	843,889.3	1,413.80				Average	
		46+16.59	1213	784,655.9	844,006.4	1,412.90				Average	
		44+15.55	1212	784,497.4	844,128.4	1,411.90				Average	
		42+14.47	1211	784,342.7	844,255.2	1,410.90				Average	
		40+13.38	1210	784,192.2	844,386.8	1,409.90				Average	
		38+12.29	1209	784,046.4	844,523.7	1,408.90				Average	
		36+11.20	1208	783,905.5	844,665.7	1,407.90				Average	
		34+10.12	1207	783,769.7	844,812.5	1,406.90				Average	
		33+11	1279	783,704.4	844,888.2	1,406.45					
WilliamField_RampB_ZOI(2)	24.0	point1306	1306	789,648.4	838,974.5	1,396.75				Average	
		22+00.00	1017	789,718.0	838,902.6	1,396.50					

INPUT: TRAFFIC FOR LAeq1h Volumes

SR24 Ellsworth Rd - Ironwood Rd

AZTEC Engineering		30 August 2019										
AZTEC Engineering		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		SR24 Ellsworth Rd - Ironwood Rd										
RUN:		SR24, 2025 Interim Condition										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			V	S	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Ellsworth RampA	27+42.33	440	2302	55	70	55	34	55	0	0	0	0
	26+00.00	439	2302	55	70	55	34	55	0	0	0	0
	24+00.00	438	2302	55	70	55	34	55	0	0	0	0
	22+00.00	437	2302	55	70	55	34	55	0	0	0	0
	20+00.00	436	2302	55	70	55	34	55	0	0	0	0
	18+00.00	435	2302	55	70	55	34	55	0	0	0	0
	16+00.00	434	2302	55	70	55	34	55	0	0	0	0
	14+00.00	433	2302	55	70	55	34	55	0	0	0	0
	12+00.00	432	2302	55	70	55	34	55	0	0	0	0
	10+00.00	431	2302	55	70	55	34	55	0	0	0	0
	8+00.00	430	2302	55	70	55	34	55	0	0	0	0
	6+00.00	429	2302	55	70	55	34	55	0	0	0	0
	4+00.00	428	2302	55	70	55	34	55	0	0	0	0
	2+00.00	427	2302	55	70	55	34	55	0	0	0	0
	0+00.00	426										
Ellsworth RampB	0+00.00	441	2037	55	61	55	30	55	0	0	0	0
	2+00.00	442	2037	55	61	55	30	55	0	0	0	0
	4+00.00	443	2037	55	61	55	30	55	0	0	0	0
	6+00.00	444	2037	55	61	55	30	55	0	0	0	0
	8+00.00	445	2037	55	61	55	30	55	0	0	0	0
	10+00.00	446	2037	55	61	55	30	55	0	0	0	0
	12+00.00	447	2037	55	61	55	30	55	0	0	0	0
	14+00.00	448	2037	55	61	55	30	55	0	0	0	0
	16+00.00	449	2037	55	61	55	30	55	0	0	0	0
	18+00.00	450	2037	55	61	55	30	55	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	20+00.00	451										
Ellsworth RampC	27+57.73	470	8	55	1	55	0	0	0	0	0	0
	26+00.00	469	8	55	1	55	0	0	0	0	0	0
	24+00.00	468	8	55	1	55	0	0	0	0	0	0
	22+00.00	467	8	55	1	55	0	0	0	0	0	0
	20+00.00	466	8	55	1	55	0	0	0	0	0	0
	18+00.00	465	8	55	1	55	0	0	0	0	0	0
	16+00.00	464	8	55	1	55	0	0	0	0	0	0
	14+00.00	463	8	55	1	55	0	0	0	0	0	0
	12+00.00	462	8	55	1	55	0	0	0	0	0	0
	10+00.00	461	8	55	1	55	0	0	0	0	0	0
	8+00.00	460	8	55	1	55	0	0	0	0	0	0
	7+00.00	1291										
Ellsworth RampD	0+00.00	471	4	55	0	0	0	0	0	0	0	0
	2+00.00	472	4	55	0	0	0	0	0	0	0	0
	4+00.00	473	4	55	0	0	0	0	0	0	0	0
	6+00.00	474	4	55	0	0	0	0	0	0	0	0
	8+00.00	475	4	55	0	0	0	0	0	0	0	0
	10+00.00	476	4	55	0	0	0	0	0	0	0	0
	12+00.00	477	4	55	0	0	0	0	0	0	0	0
	14+00.00	478	4	55	0	0	0	0	0	0	0	0
	16+00.00	479	4	55	0	0	0	0	0	0	0	0
	18+00.00	480	4	55	0	0	0	0	0	0	0	0
	20+00.00	481	4	55	0	0	0	0	0	0	0	0
	22+00.00	482										
WilliamField_RampA	20+93.48	1005	1284	55	33	55	14	55	0	0	0	0
	20+00.00	1004	1284	55	33	55	14	55	0	0	0	0
	18+00.00	1003	1284	55	33	55	14	55	0	0	0	0
	16+00.00	1002	1284	55	33	55	14	55	0	0	0	0
	14+00.00	1001	1284	55	33	55	14	55	0	0	0	0
	12+00.00	1000	1284	55	33	55	14	55	0	0	0	0
	10+00.00	999	1284	55	33	55	14	55	0	0	0	0
	8+00.00	998	1284	55	33	55	14	55	0	0	0	0
	6+00.00	997	1284	55	33	55	14	55	0	0	0	0
	4+00.00	996	1284	55	33	55	14	55	0	0	0	0
	2+00.00	995	1284	55	33	55	14	55	0	0	0	0
	0+00.00	994										

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

WilliamField_RampB	0+00.00	1006	1290	55	33	55	13	55	0	0	0	0
	2+00.00	1007	1290	55	33	55	13	55	0	0	0	0
	4+00.00	1008	1290	55	33	55	13	55	0	0	0	0
	6+00.00	1009	1290	55	33	55	13	55	0	0	0	0
	8+00.00	1010	1290	55	33	55	13	55	0	0	0	0
	10+00.00	1011	1290	55	33	55	13	55	0	0	0	0
	12+00.00	1012	1290	55	33	55	13	55	0	0	0	0
	14+00.00	1013	1290	55	33	55	13	55	0	0	0	0
	16+00.00	1014										
WilliamField_RampC	26+85.87	1033	1284	55	33	55	14	55	0	0	0	0
	26+00.00	1032	1284	55	33	55	14	55	0	0	0	0
	24+00.00	1031	1284	55	33	55	14	55	0	0	0	0
	22+00.00	1030	1284	55	33	55	14	55	0	0	0	0
	20+00.00	1029	1284	55	33	55	14	55	0	0	0	0
	18+00.00	1028	1284	55	33	55	14	55	0	0	0	0
	16+00.00	1027	1284	55	33	55	14	55	0	0	0	0
	14+00.00	1026	1284	55	33	55	14	55	0	0	0	0
	12+00.00	1025	1284	55	33	55	14	55	0	0	0	0
	10+00.00	1024	1284	55	33	55	14	55	0	0	0	0
	8+00.00	1023	1284	55	33	55	14	55	0	0	0	0
	point1304	1304										
WilliamField_RampD	0+00.00	1034	1290	55	33	55	13	55	0	0	0	0
	2+00.00	1035	1290	55	33	55	13	55	0	0	0	0
	4+00.00	1036	1290	55	33	55	13	55	0	0	0	0
	6+00.00	1037	1290	55	33	55	13	55	0	0	0	0
	8+00.00	1038	1290	55	33	55	13	55	0	0	0	0
	10+00.00	1039	1290	55	33	55	13	55	0	0	0	0
	12+00.00	1040	1290	55	33	55	13	55	0	0	0	0
	14+00.00	1041	1290	55	33	55	13	55	0	0	0	0
	16+00.00	1042	1290	55	33	55	13	55	0	0	0	0
	18+00.00	1043	1290	55	33	55	13	55	0	0	0	0
	20+00.00	1044	1290	55	33	55	13	55	0	0	0	0
	22+00.00	1045	1290	55	33	55	13	55	0	0	0	0
	24+00.00	1046	1290	55	33	55	13	55	0	0	0	0
	24+33.79	1047										
Ellsworth Rd NB	0+00.00	1119	2043	50	50	50	20	50	0	0	0	0
	1+75.77	1120	2043	50	50	50	20	50	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	3+39.37	1121	2043	50	50	50	20	50	0	0	0	0
	5+87.48	1122	2043	50	50	50	20	50	0	0	0	0
	7+15.02	1123										
Ellsworth Rd SB	0+00.00	1124	1178	50	37	50	20	50	0	0	0	0
	1+59.42	1125	1178	50	37	50	20	50	0	0	0	0
	4+04.24	1126	1178	50	37	50	20	50	0	0	0	0
	5+60.60	1127	1178	50	37	50	20	50	0	0	0	0
	7+14.91	1128										
SR24_EB_1st_GPLane_3	86+03.05	1197	761	50	19	50	11	50	0	0	0	0
	88+00.00	674	761	50	19	50	11	50	0	0	0	0
	92+00.00	675	761	50	19	50	11	50	0	0	0	0
	96+00.00	676	761	50	19	50	11	50	0	0	0	0
	100+00.00	677										
SR24_EB_2nd_GPLane_3	86+04.38	1198	529	50	19	50	2	50	0	0	0	0
	88+00.00	589	529	50	19	50	2	50	0	0	0	0
	92+00.00	590	529	50	19	50	2	50	0	0	0	0
	96+00.00	591	529	50	19	50	2	50	0	0	0	0
	100+00.00	592										
SR24_EB_2nd_GPLane_1	28+01.70	1268	1362	50	55	50	8	50	0	0	0	0
	30+00.21	1167	1362	50	55	50	8	50	0	0	0	0
	31+98.72	1168	1362	50	55	50	8	50	0	0	0	0
	33+97.23	1169	1362	50	55	50	8	50	0	0	0	0
	35+95.74	1170	1362	50	55	50	8	50	0	0	0	0
	37+94.25	1171										
SR24_EB_1st_GPLane_1	28+00.87	1269	1960	50	55	50	35	50	0	0	0	0
	29+98.97	1134	1960	50	55	50	35	50	0	0	0	0
	31+97.07	1135	1960	50	55	50	35	50	0	0	0	0
	33+95.17	1136	1960	50	55	50	0	50	0	0	0	0
	35+93.27	1137	1960	50	55	50	35	50	0	0	0	0
	37+91.36	1138										
SR24_WB_1st_GPLane_3	100+00.00	1272	758	50	20	50	11	50	0	0	0	0
	96+00.00	278	758	50	20	50	11	50	0	0	0	0
	92+00.00	277	758	50	20	50	11	50	0	0	0	0
	88+00.00	276	758	50	20	50	11	50	0	0	0	0
	86+00.00	1285										
SR24_WB_2nd_GPLane_3	100+00.00	1273	526	50	20	50	2	50	0	0	0	0
	96+00.00	363	526	50	20	50	2	50	0	0	0	0



**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	92+00.00	362	526	50	20	50	2	50	0	0	0	0
	88+00.00	361	526	50	20	50	2	50	0	0	0	0
	86+00.00	1286										
SR24_WB_1st_GPLane_1	point1280	1280	2111	50	60	50	39	50	0	0	0	0
	32+10.72	1235	2111	50	60	50	39	50	0	0	0	0
	30+09.21	1234	2111	50	60	50	39	50	0	0	0	0
	28+07.70	1233										
SR24_WB_2nd_GPLane_1	point1281	1281	1467	50	60	50	9	50	0	0	0	0
	32+09.03	1206	1467	50	60	50	9	50	0	0	0	0
	30+07.94	1205	1467	50	60	50	9	50	0	0	0	0
	28+06.85	1204										
SR24_EB_2nd_GPLane_2	point1282	1282	527	50	19	50	2	50	0	0	0	0
	39+92.76	1172	527	50	19	50	2	50	0	0	0	0
	41+91.27	1173	527	50	19	50	2	50	0	0	0	0
	43+89.78	1174	527	50	19	50	2	50	0	0	0	0
	45+88.35	1175	527	50	19	50	2	50	0	0	0	0
	47+86.86	1176	527	50	19	50	2	50	0	0	0	0
	49+85.37	1177	527	50	19	50	2	50	0	0	0	0
	51+84.18	1178	527	50	19	50	2	50	0	0	0	0
	53+84.17	1179	527	50	19	50	2	50	0	0	0	0
	55+84.17	1180	527	50	19	50	2	50	0	0	0	0
	57+84.16	1181	527	50	19	50	2	50	0	0	0	0
	59+84.15	1182	527	50	19	50	2	50	0	0	0	0
	61+84.14	1183	527	50	19	50	2	50	0	0	0	0
	63+84.14	1184	527	50	19	50	2	50	0	0	0	0
	65+85.00	1185	527	50	19	50	2	50	0	0	0	0
	67+86.94	1186	527	50	19	50	2	50	0	0	0	0
	69+88.87	1187	527	50	19	50	2	50	0	0	0	0
	71+90.81	1188	527	50	19	50	2	50	0	0	0	0
	73+92.75	1189	527	50	19	50	2	50	0	0	0	0
	75+94.69	1190	527	50	19	50	2	50	0	0	0	0
	77+96.63	1191	527	50	19	50	2	50	0	0	0	0
	79+98.57	1192	527	50	19	50	2	50	0	0	0	0
	82+00.50	1193	527	50	19	50	2	50	0	0	0	0
	84+02.44	1194	527	50	19	50	2	50	0	0	0	0
	86+04.38	1195										
SR24_EB_1st_GPLane_2	point1283	1283	758	50	19	50	11	50	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	39+89.46	1139	758	50	19	50	11	50	0	0	0	0
	41+87.56	1140	758	50	19	50	11	50	0	0	0	0
	43+85.66	1141	758	50	19	50	11	50	0	0	0	0
	45+83.82	1142	758	50	19	50	11	50	0	0	0	0
	47+81.92	1143	758	50	19	50	11	50	0	0	0	0
	49+80.02	1144	758	50	19	50	11	50	0	0	0	0
	51+78.44	1145	758	50	19	50	11	50	0	0	0	0
	53+78.44	1146	758	50	19	50	11	50	0	0	0	0
	55+78.43	1147	758	50	19	50	11	50	0	0	0	0
	57+78.42	1148	758	50	19	50	11	50	0	0	0	0
	59+78.41	1149	758	50	19	50	11	50	0	0	0	0
	61+78.41	1150	758	50	19	50	11	50	0	0	0	0
	63+78.40	1151	758	50	19	50	11	50	0	0	0	0
	65+79.38	1152	758	50	19	50	11	50	0	0	0	0
	67+81.75	1153	758	50	19	50	11	50	0	0	0	0
	69+84.12	1154	758	50	19	50	11	50	0	0	0	0
	71+86.48	1155	758	50	19	50	11	50	0	0	0	0
	73+88.85	1156	758	50	19	50	11	50	0	0	0	0
	75+91.22	1157	758	50	19	50	11	50	0	0	0	0
	77+93.58	1158	758	50	19	50	11	50	0	0	0	0
	79+95.95	1159	758	50	19	50	11	50	0	0	0	0
	81+98.31	1160	758	50	19	50	11	50	0	0	0	0
	84+00.68	1161	758	50	19	50	11	50	0	0	0	0
	86+03.05	1162										
Ellsworth RampC_ZOI(2)	1+00.00	1292	8	18	1	13	0	0	0	0	0	0
	2+00.00	1289										
Ellsworth RampC_ZOI(1)	7+00.00	1293	8	41	1	36	0	0	0	0	0	0
	6+00.00	459	8	41	1	36	0	0	0	0	0	0
	4+00.00	458	8	41	1	36	0	0	0	0	0	0
	2+00.00	457										
Ellsworth RampB_ZOI(2)	25+00.00	1296	2037	18	61	13	30	10	0	0	0	0
	26+00.00	454										
Ellsworth RampB_ZOI(1)	20+00.00	1297	2037	41	61	36	30	33	0	0	0	0
	22+00.00	452	2037	41	61	36	30	33	0	0	0	0
	24+00.00	453	2037	41	61	36	30	33	0	0	0	0
	25+00.00	1295										
WilliamField_RampB_ZOI(1)	point1302	1302	1290	41	33	36	13	33	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	18+00.00	1015	1290	41	33	36	13	33	0	0	0	0
	20+00.00	1016	1290	41	33	36	13	33	0	0	0	0
	21+00.00	1301										
WilliamField_RampC_ZOI(2)	point1303	1303	1284	18	33	13	14	10	0	0	0	0
	1+00.00	1298										
WilliamField_RampC_ZOI(1)	point1305	1305	1284	41	33	36	14	33	0	0	0	0
	6+00.00	1022	1284	41	33	36	14	33	0	0	0	0
	4+00.00	1021	1284	41	33	36	14	33	0	0	0	0
	2+00.00	1020										
SR24_WB_1st_GPLane_2	point1287	1287	752	50	19	50	11	50	0	0	0	0
	84+00.00	275	752	50	19	50	11	50	0	0	0	0
	80+00.00	274	752	50	19	50	11	50	0	0	0	0
	78+60.68	1259	752	50	19	50	11	50	0	0	0	0
	78+11.29	1258	752	50	19	50	11	50	0	0	0	0
	76+13.60	1257	752	50	19	50	11	50	0	0	0	0
	74+15.91	1256	752	50	19	50	11	50	0	0	0	0
	72+18.17	1255	752	50	19	50	11	50	0	0	0	0
	70+20.34	1254	752	50	19	50	11	50	0	0	0	0
	68+22.33	1253	752	50	19	50	11	50	0	0	0	0
	66+23.82	1252	752	50	19	50	11	50	0	0	0	0
	64+24.58	1251	752	50	19	50	11	50	0	0	0	0
	63+24.58	1275	752	50	19	50	11	50	0	0	0	0
	62+24.58	1250	752	50	19	50	11	50	0	0	0	0
	61+24.58	1274	752	50	19	50	11	50	0	0	0	0
	60+24.58	1249	752	50	19	50	11	50	0	0	0	0
	58+24.58	1248	752	50	19	50	11	50	0	0	0	0
	56+24.58	1247	752	50	19	50	11	50	0	0	0	0
	54+24.58	1246	752	50	19	50	11	50	0	0	0	0
	52+24.58	1245	752	50	19	50	11	50	0	0	0	0
	50+23.90	1244	752	50	19	50	11	50	0	0	0	0
	48+22.64	1243	752	50	19	50	11	50	0	0	0	0
	46+21.25	1242	752	50	19	50	11	50	0	0	0	0
	44+19.79	1241	752	50	19	50	11	50	0	0	0	0
	42+18.29	1240	752	50	19	50	11	50	0	0	0	0
	40+16.77	1239	752	50	19	50	11	50	0	0	0	0
	38+15.26	1238	752	50	19	50	11	50	0	0	0	0
	36+13.75	1237	752	50	19	50	11	50	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	34+12.24	1236	752	50	19	50	11	50	0	0	0	0
	33+11	1278										
SR24_WB_2nd_GPLane_2	point1288	1288	523	50	19	50	2	50	0	0	0	0
	84+00.00	360	523	50	19	50	2	50	0	0	0	0
	80+00.00	359	523	50	19	50	2	50	0	0	0	0
	78+60.68	1230	523	50	19	50	2	50	0	0	0	0
	78+08.34	1229	523	50	19	50	2	50	0	0	0	0
	76+10.24	1228	523	50	19	50	2	50	0	0	0	0
	74+12.14	1227	523	50	19	50	2	50	0	0	0	0
	72+13.99	1226	523	50	19	50	2	50	0	0	0	0
	70+15.74	1225	523	50	19	50	2	50	0	0	0	0
	68+17.32	1224	523	50	19	50	2	50	0	0	0	0
	66+18.37	1223	523	50	19	50	2	50	0	0	0	0
	64+18.84	1222	523	50	19	50	2	50	0	0	0	0
	63+18.84	1277	523	50	19	50	2	50	0	0	0	0
	62+18.84	1221	523	50	19	50	2	50	0	0	0	0
	61+18.84	1276	523	50	19	50	2	50	0	0	0	0
	60+18.84	1220	523	50	19	50	2	50	0	0	0	0
	58+18.84	1219	523	50	19	50	2	50	0	0	0	0
	56+18.84	1218	523	50	19	50	2	50	0	0	0	0
	54+18.84	1217	523	50	19	50	2	50	0	0	0	0
	52+18.84	1216	523	50	19	50	2	50	0	0	0	0
	50+18.40	1215	523	50	19	50	2	50	0	0	0	0
	48+17.55	1214	523	50	19	50	2	50	0	0	0	0
	46+16.59	1213	523	50	19	50	2	50	0	0	0	0
	44+15.55	1212	523	50	19	50	2	50	0	0	0	0
	42+14.47	1211	523	50	19	50	2	50	0	0	0	0
	40+13.38	1210	523	50	19	50	2	50	0	0	0	0
	38+12.29	1209	523	50	19	50	2	50	0	0	0	0
	36+11.20	1208	523	50	19	50	2	50	0	0	0	0
	34+10.12	1207	523	50	19	50	2	50	0	0	0	0
	33+11	1279										
WilliamField_RampB_ZOI(2)	point1306	1306	1290	18	33	13	13	10	0	0	0	0
	22+00.00	1017										

INPUT: BARRIERS

SR24 Ellsworth Rd - Ironwood Rd

AZTEC Engineering	30 August 2019
AZTEC Engineering	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: SR24 Ellsworth Rd - Ironwood Rd  
 RUN: SR24, 2025 Interim Condition

Barrier									Points									
Name	Type	Height		If Wall	If Berm		Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment			On	Important
		Min	Max	\$ per Unit Area	\$ per Unit Vol.	Top Width	Run:Rise	\$ per Unit Length		X	Y	Z	at Point	Seg Ht	Perturbs	Struct?	Reflec-tions?	
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft		ft	ft	ft	ft	ft	ft			
PrivacyWall_1	W	0.00	99.99	0.00				0.00	P1	1	788,451.2	842,765.3	1,399.10	6.00	0.00	0	0	
									P2	2	788,296.5	842,765.8	1,398.49	6.00	0.00	0	0	
									P3	3	788,296.2	842,661.4	1,399.01	6.00				
ConcreteBarrier_34"high	W	0.00	99.99	0.00				0.00	41+96.92	22	784,349.6	844,290.3	1,410.80	2.83	0.00	0	0	
									42+86.61	23	784,417.7	844,233.3	1,411.24	2.83	0.00	0	0	
									43+75.47	24	784,486.0	844,178.0	1,411.67	2.83	0.00	0	0	
									44+81.20	25	784,568.3	844,113.6	1,412.19	2.83	0.00	0	0	
									45+55.58	26	784,627.0	844,069.1	1,412.55	2.83	0.00	0	0	
									46+01.32	27	784,663.4	844,042.3	1,412.78	2.83	0.00	0	0	
									46+38.95	28	784,693.4	844,020.3	1,412.96	2.83	0.00	0	0	
									47+04.89	29	784,746.4	843,982.3	1,413.28	2.83	0.00	0	0	
									47+91.18	30	784,816.5	843,933.5	1,413.71	2.83	0.00	0	0	
									48+71.72	31	784,882.5	843,889.0	1,414.10	2.83	0.00	0	0	
									49+57.53	32	784,953.6	843,842.5	1,414.52	2.83	0.00	0	0	
									50+05.72	33	784,993.9	843,817.1	1,414.76	2.83	0.00	0	0	
									50+55.01	34	785,035.1	843,791.0	1,415.00	2.83	0.00	0	0	
									51+49.76	35	785,115.2	843,742.3	1,415.46	2.83	0.00	0	0	
									52+44.93	36	785,196.9	843,693.5	1,415.93	2.83	0.00	0	0	
									53+88.41	37	785,320.0	843,619.8	1,416.63	2.83	0.00	0	0	
									54+07.22	38	785,336.2	843,610.1	1,416.72	2.83	0.00	0	0	
									54+23.55	39	785,350.2	843,601.8	1,416.80	2.83				
MedianBarrier_44"high	W	0.00	99.99	0.00				0.00	28+00.00	54	783,365.1	845,267.6	1,404.00	3.67	0.00	0	0	
									32+00.00	55	783,609.5	844,951.0	1,405.90	3.67	0.00	0	0	
									36+00.00	56	783,875.4	844,652.3	1,407.90	3.67	0.00	0	0	
									40+00.00	57	784,161.5	844,372.9	1,409.80	3.67	0.00	0	0	
									44+00.00	58	784,466.4	844,114.1	1,411.80	3.67	0.00	0	0	
									48+00.00	59	784,788.6	843,877.2	1,413.80	3.67	0.00	0	0	
									52+00.00	60	785,126.4	843,663.1	1,415.70	3.67	0.00	0	0	
									56+00.00	61	785,469.6	843,457.7	1,417.70	3.67	0.00	0	0	
									60+00.00	62	785,812.9	843,252.4	1,418.10	3.67	0.00	0	0	
									64+00.00	63	786,156.2	843,047.1	1,412.50	3.67	0.00	0	0	
									68+00.00	64	786,495.2	842,834.8	1,401.90	3.67	0.00	0	0	
									72+00.00	65	786,819.0	842,600.1	1,393.80	3.67	0.00	0	0	
									76+00.00	66	787,125.6	842,343.4	1,392.20	3.67	0.00	0	0	
									78+00.00	68	787,269.6	842,204.6	1,393.20	3.67				
ConcreteBarrier_34"high-2-2	W	0.00	99.99	0.00				0.00	point71	71	785,350.8	843,600.4	1,416.82	2.83	0.00	0	0	
									55+44.15	41	785,458.6	843,545.1	1,417.40	2.83	0.00	0	0	

INPUT: BARRIERS

SR24 Ellsworth Rd - Ironwood Rd

									56+77.23	42	785,575.8	843,484.8	1,418.05	2.83	0.00	0	0		
									57+76.76	43	785,662.5	843,435.8	1,418.48	2.83	0.00	0	0		
									60+18.99	44	785,873.4	843,316.5	1,417.99	2.83	0.00	0	0	Y	
									61+64.64	45	785,997.8	843,240.8	1,416.56	2.83	0.00	0	0	Y	
									61+76.68	46	786,008.2	843,234.7	1,416.40	2.83	0.00	0	0	Y	
									63+68.75	47	786,173.8	843,137.4	1,413.12	2.83	0.00	0	0	Y	
									65+51.28	48	786,330.9	843,042.8	1,408.65	2.83	0.00	0	0		
									65+75.46	49	786,351.6	843,029.6	1,407.99	2.83	0.00	0	0		
									67+72.27	50	786,519.9	842,922.1	1,402.63	2.83	0.00	0	0		
									69+44.49	51	786,664.0	842,823.0	1,398.24	2.83	0.00	0	0		
									69+69.55	52	786,684.5	842,808.0	1,397.69	2.83	0.00	0	0		
									70+87.69	53	786,781.4	842,737.4	1,395.44	2.83					
PrivacyWall_2	W	0.00	99.99	0.00				0.00	P5	73	788,303.6	842,593.0	1,398.27	6.00	0.00	0	0		
									P6	6	788,303.6	842,283.9	1,397.03	6.00	0.00	0	0		
									P7	7	788,430.7	842,283.9	1,397.45	6.00					
PrivacyWall_3	W	0.00	99.99	0.00				0.00	P8	75	788,317.1	842,213.8	1,396.84	6.00	0.00	0	0		
									P9	9	788,317.4	841,981.9	1,395.87	6.00	0.00	0	0		
									P10	10	788,383.5	841,981.3	1,396.11	6.00					
PrivacyWall_4	W	0.00	99.99	0.00				0.00	P11	77	788,364.5	841,923.3	1,395.90	6.00	0.00	0	0		
									P12	12	788,365.3	841,825.2	1,395.77	6.00	0.00	0	0		
									P13	13	788,575.2	841,827.0	1,396.68	6.00	0.00	0	0		
									P14	14	788,574.4	841,926.5	1,397.08	6.00					
PrivacyWall_5	W	0.00	99.99	0.00				0.00	P14	78	788,650.9	841,920.4	1,397.08	6.00	0.00	0	0		
									P15	15	788,650.4	841,848.0	1,397.06	6.00	0.00	0	0		
									P16	16	788,870.4	841,843.5	1,397.87	6.00	0.00	0	0		
									P17	17	788,870.5	841,925.7	1,398.52	6.00					
PrivacyWall_6	W	0.00	99.99	0.00				0.00	P17	79	788,923.2	841,912.1	1,398.52	6.00	0.00	0	0		
									P18	18	788,923.3	841,815.6	1,398.80	6.00	0.00	0	0		
									P19	19	789,179.3	841,812.8	1,398.93	6.00	0.00	0	0		
									P20	20	789,493.3	841,809.4	1,399.84	6.00	0.00	0	0		
									P21	21	789,494.5	841,918.4	1,400.49	6.00					
FuturePotentialPW	W	0.00	99.99	0.00				0.00	P1	80	786,161.8	844,092.3	1,387.56	6.00	0.00	0	0		
									P2	81	786,161.8	843,963.7	1,387.62	6.00	0.00	0	0		
									P3	82	786,157.0	843,739.8	1,387.14	6.00	0.00	0	0		
									P4	83	786,380.5	843,685.3	1,389.48	6.00	0.00	0	0		
									P5	84	786,545.4	843,644.0	1,390.50	6.00	0.00	0	0		
									P6	85	786,700.4	843,604.6	1,392.11	6.00	0.00	0	0		
									P7	86	786,815.4	843,451.4	1,393.30	6.00	0.00	0	0		
									P8	87	786,915.8	843,314.3	1,394.85	6.00	0.00	0	0		
									P9	88	787,016.3	843,177.1	1,395.71	6.00	0.00	0	0		
									P10	89	787,134.4	843,015.7	1,395.69	6.00	0.00	0	0		
									P11	90	787,252.5	842,854.3	1,395.34	6.00	0.00	0	0		
									P12	91	787,376.6	842,684.9	1,393.81	6.00	0.00	0	0		
									P13	92	787,447.5	842,588.1	1,393.68	6.00	0.00	0	0		
									P14	93	787,542.0	842,459.0	1,393.99	6.00	0.00	0	0		
									P15	94	787,666.0	842,289.5	1,395.04	6.00	0.00	0	0		
									P16	95	787,849.2	842,039.4	1,394.14	6.00	0.00	0	0		
									P17	96	787,996.8	841,837.7	1,393.91	6.00	0.00	0	0		
									P18	97	788,120.9	841,668.2	1,394.43	6.00	0.00	0	0		
									P19	98	788,256.7	841,482.6	1,394.55	6.00	0.00	0	0		

INPUT: BARRIERS

SR24 Ellsworth Rd - Ironwood Rd

									P20	99	788,374.9	841,321.2	1,394.53	6.00	0.00	0	0		
									P21	100	788,429.4	841,247.2	1,394.73	6.00	0.00	0	0		
									P22	101	788,609.2	841,045.7	1,395.05	6.00	0.00	0	0		
									P23	102	788,842.3	840,784.6	1,396.02	6.00	0.00	0	0		
									P24	103	789,035.4	840,568.3	1,396.65	6.00	0.00	0	0		
									P25	104	789,255.2	840,322.1	1,397.15	6.00	0.00	0	0		
									P26	105	789,401.7	840,158.0	1,397.44	6.00	0.00	0	0		
									P27	106	789,554.9	839,986.4	1,397.41	6.00	0.00	0	0		
									P28	107	789,714.7	839,807.4	1,397.41	6.00	0.00	0	0		
									P29	108	789,914.5	839,583.6	1,397.87	6.00	0.00	0	0		
									P30	109	790,081.0	839,397.1	1,398.17	6.00	0.00	0	0		
									P31	110	790,232.7	839,233.4	1,399.09	6.00	0.00	0	0		
									P32	111	790,358.2	839,279.7	1,399.54	6.00	0.00	0	0		
									P33	112	790,577.3	839,353.3	1,399.70	6.00					

**INPUT: RECEIVERS**

**SR24 Ellsworth Rd - Ironwood Rd**

AZTEC Engineering							30 August 2019					
AZTEC Engineering							TNM 2.5					
<b>INPUT: RECEIVERS</b>												
<b>PROJECT/CONTRACT:</b>			SR24 Ellsworth Rd - Ironwood Rd									
<b>RUN:</b>			SR24, 2025 Interim Condition									
<b>Receiver</b>												
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria				Active in Calc.	
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'l	NR Goal		
			ft	ft	ft	ft	dBA	dBA	dB	dB		
R1	1	10	786,331.2	843,997.5	1,387.71	5.00	0.00	66	10.0	8.0	Y	
R2	2	10	786,703.9	843,902.9	1,391.52	5.00	0.00	66	10.0	8.0	Y	
R3	3	10	787,021.7	843,673.2	1,394.33	5.00	0.00	66	15.0	7.0	Y	
R4	4	10	787,279.8	843,308.1	1,397.46	5.00	0.00	66	15.0	7.0	Y	
R5	5	10	787,733.4	842,688.4	1,395.65	5.00	0.00	66	15.0	7.0	Y	
R6	6	10	787,924.0	842,428.1	1,395.88	5.00	0.00	66	15.0	7.0	Y	
R7	7	10	788,212.1	842,034.6	1,395.64	5.00	0.00	66	15.0	7.0	Y	
R8	8	4	788,328.2	842,557.3	1,398.42	5.00	0.00	66	15.0	7.0	Y	
R9	9	4	788,323.4	842,313.2	1,397.23	5.00	0.00	66	15.0	7.0	Y	
R10	10	4	788,347.4	842,028.4	1,396.07	5.00	0.00	66	15.0	7.0	Y	
R11	11	2	788,377.2	841,845.2	1,395.74	5.00	0.00	66	15.0	7.0	Y	
R12	12	3	788,560.8	841,846.9	1,396.71	5.00	0.00	66	15.0	7.0	Y	
R13	13	4	788,755.6	841,862.9	1,397.56	5.00	0.00	66	15.0	7.0	Y	
R14	14	3	788,945.6	841,839.6	1,398.54	5.00	0.00	66	15.0	7.0	Y	
R15	15	4	788,758.4	841,970.9	1,398.03	5.00	0.00	66	15.0	7.0	Y	
R16	16	4	788,460.4	842,088.6	1,396.84	5.00	0.00	66	15.0	7.0	Y	
R17	17	10	788,519.7	841,614.4	1,395.91	5.00	0.00	66	15.0	7.0	Y	
R18	18	10	788,774.1	841,298.2	1,396.26	5.00	0.00	66	15.0	7.0	Y	
R19	19	10	789,049.9	840,992.9	1,396.59	5.00	0.00	66	15.0	7.0	Y	
R20	20	10	789,324.6	840,688.8	1,397.70	5.00	0.00	66	15.0	7.0	Y	
R21	21	10	789,594.1	840,390.4	1,398.35	5.00	0.00	66	15.0	7.0	Y	
R22	22	10	789,869.6	840,085.5	1,398.59	5.00	0.00	66	15.0	7.0	Y	
R23	23	10	790,153.6	839,771.1	1,399.16	5.00	0.00	66	15.0	7.0	Y	



**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

<p>AZTEC Engineering AZTEC Engineering</p>	<p>30 August 2019 TNM 2.5</p>
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<p>INPUT: ROADWAYS PROJECT/CONTRACT: SR24 Ellsworth Rd - Ironwood Rd RUN: SR24, 2040 Ultimate Condition</p>	<p>Average pavement type shall be used unless a State highway agency substantiates the use of a different type with the approval of FHWA</p>
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Roadway Name	Width	Points		Coordinates (pavement)			Flow Control			Segment	
		Name	No.	X	Y	Z	Control Device	Speed Constraint	Percent Vehicles Affected	Pvmt Type	On Struct?
	ft			ft	ft	ft		mph	%		
Ellsworth RampA	24.0	27+42.33	440	786,016.7	843,575.2	1,389.30	Onramp	10.00	100	Average	
		26+00.00	439	785,878.5	843,609.4	1,387.70					Average
		24+00.00	438	785,684.3	843,657.4	1,385.90					Average
		22+00.00	437	785,490.2	843,705.4	1,386.40					Average
		20+00.00	436	785,296.0	843,753.4	1,387.20					Average
		18+00.00	435	785,104.4	843,809.9	1,388.80					Average
		16+00.00	434	784,924.9	843,897.5	1,393.80					Average
		14+00.00	433	784,761.4	844,012.6	1,400.70					Average
		12+00.00	432	784,601.4	844,132.5	1,406.00					Average
		10+00.00	431	784,441.3	844,252.4	1,408.80					Average
		8+00.00	430	784,282.3	844,373.8	1,409.00					Average
		6+00.00	429	784,128.9	844,502.0	1,409.30					Average
		4+00.00	428	783,981.8	844,637.5	1,408.30					Average
2+00.00	427	783,837.8	844,776.4	1,407.30	Average						
0+00.00	426	783,779.8	844,837.1	1,406.90							
Ellsworth RampB	24.0	0+00.00	441	783,965.0	844,457.9	1,408.90				Average	
		2+00.00	442	784,100.5	844,310.8	1,409.80	Average				
		4+00.00	443	784,241.0	844,168.5	1,410.80	Average				
		6+00.00	444	784,386.2	844,031.0	1,414.10	Average				
		8+00.00	445	784,532.9	843,895.0	1,414.10	Average				
		10+00.00	446	784,679.5	843,758.9	1,411.80	Average				
		12+00.00	447	784,826.1	843,622.9	1,407.10	Average				
		14+00.00	448	784,972.7	843,486.9	1,400.60	Average				
16+00.00	449	785,119.3	843,350.9	1,393.90	Average						
18+00.00	450	785,266.0	843,214.8	1,387.20	Average						
20+00.00	451	785,421.2	843,089.1	1,380.60							
Ellsworth RampC	24.0	27+57.73	470	787,868.8	841,653.8	1,397.20				Average	

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		26+00.00	469	787,771.7	841,778.1	1,396.50				Average
		24+00.00	468	787,648.6	841,935.7	1,395.50				Average
		22+00.00	467	787,525.5	842,093.3	1,394.50				Average
		20+00.00	466	787,402.3	842,250.9	1,396.00				Average
		18+00.00	465	787,279.5	842,408.7	1,395.50				Average
		16+00.00	464	787,162.7	842,571.0	1,394.60				Average
		14+00.00	463	787,054.6	842,739.3	1,393.40				Average
		12+00.00	462	786,951.1	842,910.4	1,392.30				Average
		10+00.00	461	786,847.7	843,081.6	1,391.20				Average
		8+00.00	460	786,727.3	843,240.8	1,390.10				Average
		point1192	1192	786,651.9	843,306.1	1,389.50				
Ellsworth RampD	24.0	0+00.00	471	786,030.6	842,860.3	1,387.50	Onramp	10.00	100	Average
		2+00.00	472	786,224.7	842,812.3	1,386.30				Average
		4+00.00	473	786,410.8	842,740.3	1,387.00				Average
		6+00.00	474	786,576.2	842,628.6	1,390.50				Average
		8+00.00	475	786,731.6	842,502.7	1,393.60				Average
		10+00.00	476	786,887.1	842,376.8	1,394.00				Average
		12+00.00	477	787,042.5	842,250.9	1,391.90				Average
		14+00.00	478	787,196.8	842,123.8	1,391.30				Average
		16+00.00	479	787,345.5	841,990.0	1,392.30				Average
		18+00.00	480	787,487.6	841,849.3	1,395.30				Average
		20+00.00	481	787,622.8	841,701.9	1,396.30				Average
		22+00.00	482	787,750.7	841,548.2	1,397.30				
WilliamField_RampA	24.0	20+93.48	1005	790,134.0	839,044.9	1,398.50	Onramp	10.00	100	Average
		20+00.00	1004	790,069.0	839,112.1	1,398.50				Average
		18+00.00	1003	789,930.0	839,255.9	1,397.80				Average
		16+00.00	1002	789,790.9	839,399.7	1,398.60				Average
		14+00.00	1001	789,651.9	839,543.5	1,400.00				Average
		12+00.00	1000	789,512.9	839,687.2	1,401.10				Average
		10+00.00	999	789,373.9	839,831.0	1,400.30				Average
		8+00.00	998	789,234.9	839,974.8	1,397.70				Average
		6+00.00	997	789,097.6	840,120.2	1,396.10				Average
		4+00.00	996	788,964.2	840,269.2	1,396.60				Average
		2+00.00	995	788,834.8	840,421.8	1,397.30				Average
		0+00.00	994	788,709.6	840,577.7	1,398.30				
WilliamField_RampB	24.0	1+00.00	1006	788,487.3	840,627.5	1,399.10				Average
		2+00.00	1007	788,561.6	840,526.2	1,398.60				Average
		4+00.00	1008	788,679.1	840,364.4	1,397.60				Average
		6+00.00	1009	788,792.9	840,199.9	1,396.70				Average
		8+00.00	1010	788,902.8	840,032.8	1,395.60				Average

INPUT: ROADWAYS

SR24 Ellsworth Rd - Ironwood Rd

		10+00.00	1011	789,008.8	839,863.2	1,396.30				Average
		12+00.00	1012	789,111.2	839,691.4	1,398.00				Average
		14+00.00	1013	789,213.0	839,519.3	1,398.80				Average
		16+00.00	1014	789,319.3	839,350.0	1,397.40				
WilliamField_RampC	24.0	26+85.87	1033	792,228.1	837,401.5	1,407.80				Average
		26+00.00	1032	792,150.7	837,438.6	1,407.30				Average
		24+00.00	1031	791,972.5	837,529.3	1,406.30				Average
		22+00.00	1030	791,797.5	837,626.2	1,405.30				Average
		20+00.00	1029	791,626.1	837,729.2	1,404.30				Average
		18+00.00	1028	791,458.3	837,838.0	1,403.30				Average
		16+00.00	1027	791,294.5	837,952.7	1,401.20				Average
		14+00.00	1026	791,134.7	838,073.0	1,401.80				Average
		12+00.00	1025	790,979.2	838,198.8	1,404.00				Average
		10+00.00	1024	790,828.3	838,330.0	1,405.40				Average
		8+00.00	1023	790,682.0	838,466.3	1,404.20				Average
		point1203	1203	790,611.2	838,537.0	1,403.00				
WilliamField_RampD	24.0	0+00.00	1034	789,763.2	838,839.1	1,396.70	Onramp	10.00	100	Average
		2+00.00	1035	789,902.3	838,695.3	1,398.20				Average
		4+00.00	1036	790,041.3	838,551.6	1,396.80				Average
		6+00.00	1037	790,186.3	838,413.9	1,397.30				Average
		8+00.00	1038	790,340.5	838,286.5	1,398.50				Average
		10+00.00	1039	790,503.2	838,170.3	1,399.70				Average
		12+00.00	1040	790,673.6	838,065.7	1,400.90				Average
		14+00.00	1041	790,849.1	837,969.8	1,402.00				Average
		16+00.00	1042	791,024.8	837,874.3	1,403.10				Average
		18+00.00	1043	791,200.5	837,778.8	1,403.90				Average
		20+00.00	1044	791,376.3	837,683.2	1,403.40				Average
		22+00.00	1045	791,552.0	837,587.7	1,404.30				Average
		24+00.00	1046	791,727.7	837,492.2	1,405.30				Average
		24+33.79	1047	791,757.4	837,476.1	1,405.50				
SR24_WB_1st_GPlane	12.0	156+00.00	293	792,956.3	837,098.8	1,411.80				Average
		152+00.00	292	792,585.3	837,238.6	1,409.80				Average
		148+00.00	291	792,222.2	837,397.7	1,407.80				Average
		144+00.00	290	791,867.9	837,575.5	1,405.80				Average
		140+00.00	289	791,523.3	837,771.7	1,403.80				Average
		136+00.00	288	791,189.5	837,985.6	1,403.20				Average
		132+00.00	287	790,867.4	838,216.7	1,407.50				Average
		128+00.00	286	790,557.8	838,464.3	1,415.50				Average
		124+00.00	285	790,261.6	838,727.8	1,423.30				Average
		120+00.00	284	789,979.6	839,006.4	1,425.50				Average

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		116+00.00	283	789,712.5	839,299.4	1,420.50				Average
		112+00.00	282	789,461.0	839,606.1	1,410.00				Average
		108+00.00	281	789,214.8	839,921.3	1,400.30				Average
		104+00.00	280	788,968.5	840,236.5	1,396.70				Average
		100+00.00	279	788,722.2	840,551.7	1,398.20				
SR24_WB_2nd_GPLane	12.0	156+00.00	378	792,952.3	837,087.5	1,411.80				Average
		152+00.00	377	792,580.8	837,227.5	1,409.80				Average
		148+00.00	376	792,217.1	837,386.8	1,407.80				Average
		144+00.00	375	791,862.2	837,565.0	1,405.80				Average
		140+00.00	374	791,517.1	837,761.4	1,403.80				Average
		136+00.00	373	791,182.8	837,975.7	1,403.20				Average
		132+00.00	372	790,860.2	838,207.1	1,407.50				Average
		128+00.00	371	790,550.1	838,455.1	1,415.50				Average
		124+00.00	370	790,253.4	838,719.0	1,423.30				Average
		120+00.00	369	789,970.9	838,998.1	1,425.50				Average
		116+00.00	368	789,703.4	839,291.6	1,420.50				Average
		112+00.00	367	789,451.6	839,598.7	1,410.00				Average
		108+00.00	366	789,205.3	839,913.9	1,400.30				Average
		104+00.00	365	788,959.1	840,229.1	1,396.70				Average
		100+00.00	364	788,712.8	840,544.4	1,398.20				
SR24_WB_3rd_GPLane	12.0	156+00.00	776	792,948.4	837,076.1	1,411.80				Average
		152+00.00	775	792,576.3	837,216.4	1,409.80				Average
		148+00.00	774	792,212.0	837,376.0	1,407.80				Average
		144+00.00	773	791,856.5	837,554.4	1,405.80				Average
		140+00.00	772	791,510.9	837,751.1	1,403.80				Average
		136+00.00	771	791,176.1	837,965.7	1,403.20				Average
		132+00.00	770	790,852.9	838,197.5	1,407.50				Average
		128+00.00	769	790,542.3	838,446.0	1,415.50				Average
		124+00.00	768	790,245.2	838,710.3	1,423.30				Average
		120+00.00	767	789,962.3	838,989.8	1,425.50				Average
		116+00.00	766	789,694.4	839,283.7	1,420.50				Average
		112+00.00	765	789,442.1	839,591.4	1,410.00				Average
		108+00.00	764	789,195.9	839,906.6	1,400.30				Average
		104+00.00	763	788,949.6	840,221.8	1,396.70				Average
		100+00.00	762	788,703.3	840,537.0	1,398.20				
SR24_WB_4th_GPLane	12.0	156+00.00	861	792,944.5	837,064.8	1,411.80				Average
		152+00.00	860	792,571.7	837,205.3	1,409.80				Average
		148+00.00	859	792,206.9	837,365.1	1,407.80				Average
		144+00.00	858	791,850.9	837,543.8	1,405.80				Average
		140+00.00	857	791,504.7	837,740.9	1,403.80				Average

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		136+00.00	856	791,169.3	837,955.8	1,403.20				Average
		132+00.00	855	790,845.7	838,188.0	1,407.50				Average
		128+00.00	854	790,534.6	838,436.8	1,415.50				Average
		124+00.00	853	790,237.0	838,701.5	1,423.30				Average
		120+00.00	852	789,953.6	838,981.5	1,425.50				Average
		116+00.00	851	789,685.3	839,275.9	1,420.50				Average
		112+00.00	850	789,432.7	839,584.0	1,410.00				Average
		108+00.00	849	789,186.4	839,899.2	1,400.30				Average
		104+00.00	848	788,940.1	840,214.4	1,396.70				Average
		100+00.00	847	788,693.9	840,529.6	1,398.20				
SR24_WB_HOV	20.0	156+00.00	946	792,940.5	837,053.5	1,411.80				Average
		152+00.00	945	792,567.2	837,194.2	1,409.80				Average
		148+00.00	944	792,201.8	837,354.3	1,407.80				Average
		144+00.00	943	791,845.2	837,533.2	1,405.80				Average
		140+00.00	942	791,498.5	837,730.6	1,403.80				Average
		136+00.00	941	791,162.6	837,945.9	1,403.20				Average
		132+00.00	940	790,838.4	838,178.4	1,407.50				Average
		128+00.00	939	790,526.9	838,427.6	1,415.50				Average
		124+00.00	938	790,228.8	838,692.8	1,423.30				Average
		120+00.00	937	789,945.0	838,973.2	1,425.50				Average
		116+00.00	936	789,676.2	839,268.0	1,420.50				Average
		112+00.00	935	789,423.2	839,576.6	1,410.00				Average
		108+00.00	934	789,176.9	839,891.8	1,400.30				Average
		104+00.00	933	788,930.7	840,207.0	1,396.70				Average
		100+00.00	932	788,684.4	840,522.2	1,398.20				
SR24_EB_HOV	20.0	28+00.00	1054	783,349.6	845,256.5	1,404.00				Average
		32+00.00	92	783,594.9	844,938.9	1,405.90				Average
		36+00.00	93	783,861.6	844,639.2	1,407.90				Average
		38+00.00	1153	784,005.1	844,499.0	1,408.85				
SR24_EB_4th_GPLane	12.0	28+00.00	1055	783,339.9	845,249.5	1,404.00				Average
		32+00.00	177	783,585.6	844,931.2	1,405.90				Average
		36+00.00	178	783,853.0	844,630.9	1,407.90				Average
		38+00.00	1154	783,996.8	844,490.4	1,408.85				
SR24_EB_3rd_GPLane	12.0	28+00.00	1056	783,330.1	845,242.5	1,404.00				Average
		32+00.00	490	783,576.4	844,923.6	1,405.90				Average
		36+00.00	491	783,844.3	844,622.6	1,407.90				Average
		38+00.00	1155	783,988.4	844,481.9	1,408.85				
SR24_EB_2nd_GPLane	12.0	28+00.00	1057	783,320.4	845,235.5	1,404.00				Average
		32+00.00	575	783,567.2	844,915.9	1,405.90				Average
		36+00.00	576	783,835.6	844,614.3	1,407.90				Average

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		38+00.00	1156	783,980.0	844,473.2	1,408.85					
SR24_EB4_1st_GPLane	12.0	28+00.00	1058	783,310.6	845,228.5	1,404.00				Average	
		32+00.00	660	783,557.9	844,908.3	1,405.90				Average	
		36+00.00	661	783,826.9	844,606.0	1,407.90				Average	
		38+00.00	1157	783,971.6	844,464.6	1,408.85					
Ramp NE	18.0	92+20.61	1117	785,745.4	843,363.9	1,418.60				Average	
		92+00.00	1116	785,727.7	843,374.5	1,418.60				Average	
		90+00.00	1115	785,558.9	843,481.6	1,418.00				Average	
		88+00.00	1114	785,394.9	843,596.0	1,417.00				Average	
		86+00.00	1113	785,236.0	843,717.5	1,414.30				Average	Y
		84+00.00	1112	785,082.5	843,845.7	1,413.00				Average	Y
		82+00.00	1111	784,931.2	843,976.5	1,411.70				Average	
		80+00.00	1110	784,779.8	844,107.2	1,410.60				Average	
		78+00.00	1109	784,628.5	844,238.0	1,409.60				Average	
		76+00.00	1108	784,477.2	844,368.7	1,408.80				Average	
		74+00.00	1107	784,325.8	844,499.5	1,408.00				Average	
		72+00.00	1106	784,174.5	844,630.3	1,407.20				Average	
		70+00.00	1105	784,023.2	844,761.0	1,406.40				Average	
		68+00.00	1104	783,874.4	844,894.7	1,405.60				Average	
		66+00.00	1103	783,732.8	845,035.9	1,404.80				Average	
		64+00.00	1102	783,598.8	845,184.3	1,403.90				Average	
		62+00.00	1118	783,472.7	845,339.5	1,402.80					
Ellsworth Rd NB	60.0	7+15.02	1123	786,067.8	842,851.1	1,386.60				Average	
		5+87.48	1122	786,065.3	842,978.7	1,386.50				Average	
		3+39.37	1121	786,060.5	843,226.7	1,387.00				Average	
		1+75.77	1120	786,057.3	843,390.3	1,387.50				Average	
		0+00.00	1119	786,054.1	843,564.6	1,388.00					
Ellsworth Rd SB	60.0	7+14.91	1128	785,979.7	843,583.7	1,388.30				Average	
		5+60.60	1127	785,982.5	843,430.1	1,387.70				Average	
		4+04.24	1126	785,985.5	843,273.7	1,387.30				Average	
		1+59.42	1125	785,990.3	843,029.0	1,386.60				Average	
		0+00.00	1124	785,993.3	842,869.6	1,386.50					
SR24_WB_3rd_GPLane-2	12.0	34+00.00	1161	783,774.6	844,830.2	1,406.90				Average	
		32+00.00	745	783,642.6	844,978.5	1,405.90				Average	
		28+00.00	1050	783,400.0	845,292.6	1,404.00					
SR24_WB_4th_GPLane-2	12.0	34+00.00	1162	783,765.6	844,822.2	1,406.90				Average	
		32+00.00	830	783,633.3	844,970.8	1,405.90				Average	
		28+00.00	1051	783,390.2	845,285.6	1,404.00					
SR24_WB_HOV-2	20.0	34+00.00	1163	783,756.6	844,814.2	1,406.90				Average	
		32+00.00	915	783,624.1	844,963.2	1,405.90				Average	

INPUT: ROADWAYS

SR24 Ellsworth Rd - Ironwood Rd

		28+00.00	1052	783,380.5	845,278.6	1,404.00					
SR24_EB_HOV-2	20.0	38+00.00	1164	784,005.1	844,499.0	1,408.85				Average	
		40+00.00	94	784,148.7	844,358.8	1,409.80				Average	
		44+00.00	95	784,454.6	844,099.2	1,411.80				Average	
		48+00.00	96	784,777.9	843,861.5	1,413.80				Average	
		52+00.00	97	785,116.6	843,646.8	1,415.70				Average	
		56+00.00	98	785,459.9	843,441.4	1,417.70				Average	
		60+00.00	99	785,803.2	843,236.1	1,418.10				Average	Y
		64+00.00	100	786,146.4	843,030.8	1,412.50				Average	Y
		68+00.00	101	786,484.6	842,819.1	1,401.90				Average	
		72+00.00	102	786,807.3	842,585.1	1,393.80				Average	
		76+00.00	103	787,112.9	842,329.3	1,392.20				Average	
		80+00.00	104	787,399.9	842,052.7	1,394.20				Average	
		84+00.00	105	787,666.9	841,756.8	1,396.20				Average	
		86+00.00	1142	787,791.2	841,600.6	1,397.20					
SR24_EB_4th_GPLane-2	12.0	38+00.00	1165	783,996.8	844,490.4	1,408.85				Average	
		40+00.00	179	784,140.6	844,350.0	1,409.80				Average	
		44+00.00	180	784,447.1	844,089.8	1,411.80				Average	
		48+00.00	181	784,771.1	843,851.6	1,413.80				Average	
		52+00.00	182	785,110.5	843,636.5	1,415.70				Average	
		56+00.00	183	785,453.7	843,431.1	1,417.70				Average	
		60+00.00	184	785,797.0	843,225.8	1,418.10				Average	Y
		64+00.00	185	786,140.3	843,020.5	1,412.50				Average	Y
		68+00.00	186	786,477.9	842,809.1	1,401.90				Average	
		72+00.00	187	786,799.9	842,575.7	1,393.80				Average	
		76+00.00	188	787,104.9	842,320.3	1,392.20				Average	
		80+00.00	189	787,391.3	842,044.3	1,394.20				Average	
		84+00.00	190	787,657.8	841,749.0	1,396.20				Average	
		86+00.00	1143	787,782.0	841,593.0	1,397.20					
SR24_EB_3rd_GPLane-2	12.0	38+00.00	1166	783,988.4	844,481.9	1,408.85				Average	
		40+00.00	492	784,132.5	844,341.1	1,409.80				Average	
		44+00.00	493	784,439.7	844,080.3	1,411.80				Average	
		48+00.00	494	784,764.3	843,841.7	1,413.80				Average	
		52+00.00	495	785,104.3	843,626.2	1,415.70				Average	
		56+00.00	496	785,447.6	843,420.8	1,417.70				Average	
		60+00.00	497	785,790.8	843,215.5	1,418.10				Average	Y
		64+00.00	498	786,134.1	843,010.2	1,412.50				Average	Y
		68+00.00	499	786,471.2	842,799.2	1,401.90				Average	
		72+00.00	500	786,792.5	842,566.2	1,393.80				Average	
		76+00.00	501	787,096.9	842,311.4	1,392.20				Average	

INPUT: ROADWAYS

SR24 Ellsworth Rd - Ironwood Rd

		80+00.00	502	787,382.7	842,036.0	1,394.20				Average	
		84+00.00	503	787,648.6	841,741.3	1,396.20				Average	
		86+00.00	1144	787,772.8	841,585.5	1,397.20					
SR24_EB_2nd_GPLane-2	12.0	38+00.00	1167	783,980.0	844,473.2	1,408.85				Average	
		40+00.00	577	784,124.4	844,332.2	1,409.80				Average	
		44+00.00	578	784,432.3	844,070.9	1,411.80				Average	
		48+00.00	579	784,757.6	843,831.8	1,413.80				Average	
		52+00.00	580	785,098.1	843,615.9	1,415.70				Average	
		56+00.00	581	785,441.4	843,410.5	1,417.70				Average	
		60+00.00	582	785,784.7	843,205.2	1,418.10				Average	Y
		64+00.00	583	786,128.0	842,999.9	1,412.50				Average	Y
		68+00.00	584	786,464.5	842,789.2	1,401.90				Average	
		72+00.00	585	786,785.1	842,556.7	1,393.80				Average	
		76+00.00	586	787,088.8	842,302.5	1,392.20				Average	
		80+00.00	587	787,374.0	842,027.6	1,394.20				Average	
		84+00.00	588	787,639.4	841,733.6	1,396.20				Average	
		86+00.00	1145	787,763.4	841,577.9	1,397.20					
SR24_EB4_1st_GPLane-2	12.0	38+00.00	1168	783,971.6	844,464.6	1,408.85				Average	
		40+00.00	662	784,116.4	844,323.3	1,409.80				Average	
		44+00.00	663	784,424.8	844,061.5	1,411.80				Average	
		48+00.00	664	784,750.8	843,821.8	1,413.80				Average	
		52+00.00	665	785,092.0	843,605.6	1,415.70				Average	
		56+00.00	666	785,435.2	843,400.3	1,417.70				Average	
		60+00.00	667	785,778.5	843,194.9	1,418.10				Average	Y
		64+00.00	668	786,121.8	842,989.6	1,412.50				Average	Y
		68+00.00	669	786,457.8	842,779.3	1,401.90				Average	
		72+00.00	670	786,777.8	842,547.3	1,393.80				Average	
		76+00.00	671	787,080.8	842,293.6	1,392.20				Average	
		80+00.00	672	787,365.4	842,019.3	1,394.20				Average	
		84+00.00	673	787,630.2	841,725.9	1,396.20				Average	
		86+00.00	1146	787,754.0	841,570.4	1,397.20					
SR24_WB_1st_GPLane-2	12.0	point1169	1169	787,858.1	841,654.8	1,397.20				Average	
		84+00.00	275	787,732.8	841,812.1	1,396.20				Average	
		80+00.00	274	787,461.7	842,112.5	1,394.20				Average	
		76+00.00	273	787,170.4	842,393.2	1,392.20				Average	
		72+00.00	272	786,860.2	842,653.0	1,393.80				Average	
		68+00.00	271	786,532.6	842,890.4	1,401.90				Average	
		64+00.00	270	786,190.6	843,104.6	1,412.50				Average	Y
		60+00.00	269	785,847.3	843,309.9	1,418.10				Average	Y
		92+20.61	268	785,748.1	843,369.3	1,418.60					



**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

SR24_WB_2nd_GPLane-2	12.0	point1170	1170	787,848.8	841,647.2	1,397.20				Average	
		84+00.00	360	787,723.6	841,804.4	1,396.20				Average	
		80+00.00	359	787,453.1	842,104.1	1,394.20				Average	
		76+00.00	358	787,162.4	842,384.3	1,392.20				Average	
		72+00.00	357	786,852.8	842,643.5	1,393.80				Average	
		68+00.00	356	786,525.9	842,880.5	1,401.90				Average	
		64+00.00	355	786,184.4	843,094.3	1,412.50				Average	Y
		60+00.00	354	785,841.1	843,299.6	1,418.10				Average	Y
		92+20.61	353	785,742.6	843,358.9	1,418.60					
SR24_WB_3rd_GPLane-2	12.0	point1171	1171	787,839.4	841,639.6	1,397.20				Average	
		84+00.00	758	787,714.4	841,796.7	1,396.20				Average	
		80+00.00	757	787,444.5	842,095.8	1,394.20				Average	
		76+00.00	756	787,154.3	842,375.4	1,392.20				Average	
		72+00.00	755	786,845.4	842,634.0	1,393.80				Average	
		68+00.00	754	786,519.2	842,870.5	1,401.90				Average	
		64+00.00	753	786,178.3	843,084.0	1,412.50				Average	Y
		60+00.00	752	785,835.0	843,289.3	1,418.10				Average	Y
		58+66.00	1131	785,720.6	843,357.8	1,417.97				Average	Y
		57+33.00	1132	785,606.1	843,426.2	1,417.83				Average	Y
		56+00.00	751	785,491.7	843,494.7	1,417.70				Average	
		52+00.00	750	785,148.4	843,700.0	1,415.70				Average	
		48+00.00	749	784,812.8	843,912.7	1,413.80				Average	
		44+00.00	748	784,493.0	844,147.8	1,411.80				Average	
		40+00.00	747	784,190.4	844,404.7	1,409.80				Average	
		36+00.00	746	783,906.5	844,682.0	1,407.90				Average	
		34+00.00	1158	783,774.6	844,830.2	1,406.90					
SR24_WB_4th_GPLane-2	12.0	point1172	1172	787,830.1	841,632.0	1,397.20				Average	
		84+00.00	843	787,705.2	841,788.9	1,396.20				Average	
		80+00.00	842	787,435.8	842,087.5	1,394.20				Average	
		76+00.00	841	787,146.3	842,366.5	1,392.20				Average	
		72+00.00	840	786,838.0	842,624.6	1,393.80				Average	
		68+00.00	839	786,512.5	842,860.6	1,401.90				Average	
		64+00.00	838	786,172.1	843,073.7	1,412.50				Average	Y
		60+00.00	837	785,828.8	843,279.0	1,418.10				Average	Y
		58+66.00	1133	785,714.4	843,347.4	1,417.97				Average	Y
		57+33.00	1134	785,600.0	843,415.9	1,417.83				Average	Y
		56+00.00	836	785,485.6	843,484.4	1,417.70				Average	
		52+00.00	835	785,142.3	843,689.7	1,415.70				Average	
		48+00.00	834	784,806.0	843,902.8	1,413.80				Average	
		44+00.00	833	784,485.6	844,138.4	1,411.80				Average	

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		40+00.00	832	784,182.4	844,395.8	1,409.80				Average	
		36+00.00	831	783,897.8	844,673.7	1,407.90				Average	
		34+00.00	1159	783,765.6	844,822.2	1,406.90					
SR24_WB_HOV-2	20.0	point1173	1173	787,820.8	841,624.5	1,397.20				Average	
		84+00.00	928	787,696.0	841,781.2	1,396.20				Average	
		80+00.00	927	787,427.2	842,079.1	1,394.20				Average	
		76+00.00	926	787,138.3	842,357.5	1,392.20				Average	
		72+00.00	925	786,830.6	842,615.1	1,393.80				Average	
		68+00.00	924	786,505.8	842,850.6	1,401.90				Average	
		64+00.00	923	786,165.9	843,063.4	1,412.50				Average	Y
		60+00.00	922	785,822.7	843,268.7	1,418.10				Average	Y
		58+66.00	1135	785,708.2	843,337.2	1,417.97				Average	Y
		57+33.00	1136	785,593.8	843,405.6	1,417.83				Average	Y
		56+00.00	921	785,479.4	843,474.1	1,417.70				Average	
		52+00.00	920	785,136.1	843,679.4	1,415.70				Average	
		48+00.00	919	784,799.3	843,892.9	1,413.80				Average	
		44+00.00	918	784,478.2	844,129.0	1,411.80				Average	
		40+00.00	917	784,174.3	844,386.9	1,409.80				Average	
		36+00.00	916	783,889.1	844,665.4	1,407.90				Average	
		34+00.00	1160	783,756.6	844,814.2	1,406.90					
SR24_EB_HOV-2-2	20.0	point1174	1174	787,791.2	841,600.6	1,397.20				Average	
		88+00.00	106	787,915.7	841,444.4	1,398.20				Average	
		92+00.00	107	788,161.9	841,129.2	1,400.00				Average	
		96+00.00	108	788,408.2	840,814.0	1,400.00				Average	
		98+00.00	1148	788,531.4	840,656.4	1,399.10					
SR24_EB_4th_GPLane-2-2	12.0	point1175	1175	787,782.0	841,593.0	1,397.20				Average	
		88+00.00	191	787,906.2	841,437.0	1,398.20				Average	
		92+00.00	192	788,152.5	841,121.8	1,400.00				Average	
		96+00.00	193	788,398.8	840,806.6	1,400.00				Average	
		98+00.00	1149	788,521.9	840,649.0	1,399.10					
SR24_EB_3rd_GPLane-2-2	12.0	point1176	1176	787,772.8	841,585.5	1,397.20				Average	
		88+00.00	504	787,896.8	841,429.6	1,398.20				Average	
		92+00.00	505	788,143.0	841,114.4	1,400.00				Average	
		96+00.00	506	788,389.3	840,799.2	1,400.00				Average	
		98+00.00	1150	788,512.5	840,641.6	1,399.10					
SR24_EB_2nd_GPLane-2-2	12.0	point1177	1177	787,763.4	841,577.9	1,397.20				Average	
		88+00.00	589	787,887.3	841,422.2	1,398.20				Average	
		92+00.00	590	788,133.6	841,107.0	1,400.00				Average	
		96+00.00	591	788,379.8	840,791.8	1,400.00				Average	
		98+00.00	1151	788,503.0	840,634.2	1,399.10					

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

SR24_EB4_1st_GPLane-2-2	12.0	point1178	1178	787,754.0	841,570.4	1,397.20				Average	
		88+00.00	674	787,877.9	841,414.9	1,398.20				Average	
		92+00.00	675	788,124.1	841,099.6	1,400.00				Average	
		96+00.00	676	788,370.4	840,784.4	1,400.00				Average	
		98+00.00	1152	788,493.5	840,626.8	1,399.10					
SR24_WB_1st_GPlane-2	12.0	point1179	1179	788,722.2	840,551.7	1,398.20				Average	
		96+00.00	278	788,476.0	840,866.9	1,400.00				Average	
		92+00.00	277	788,229.7	841,182.1	1,400.00				Average	
		88+00.00	276	787,983.4	841,497.4	1,398.20				Average	
		point1137	1137	787,858.1	841,654.8	1,397.20					
SR24_WB_2nd_GPLane-2	12.0	point1180	1180	788,712.8	840,544.4	1,398.20				Average	
		96+00.00	363	788,466.5	840,859.6	1,400.00				Average	
		92+00.00	362	788,220.3	841,174.8	1,400.00				Average	
		88+00.00	361	787,974.0	841,490.0	1,398.20				Average	
		point1138	1138	787,848.8	841,647.2	1,397.20					
SR24_WB_3rd_GPLane-2	12.0	point1181	1181	788,703.3	840,537.0	1,398.20				Average	
		96+00.00	761	788,457.1	840,852.2	1,400.00				Average	
		92+00.00	760	788,210.8	841,167.4	1,400.00				Average	
		88+00.00	759	787,964.5	841,482.6	1,398.20				Average	
		point1139	1139	787,839.4	841,639.6	1,397.20					
SR24_WB_4th_GPLane-2	12.0	point1182	1182	788,693.9	840,529.6	1,398.20				Average	
		96+00.00	846	788,447.6	840,844.8	1,400.00				Average	
		92+00.00	845	788,201.3	841,160.0	1,400.00				Average	
		88+00.00	844	787,955.1	841,475.2	1,398.20				Average	
		point1140	1140	787,830.1	841,632.0	1,397.20					
SR24_WB_HOV-2	20.0	point1183	1183	788,684.4	840,522.2	1,398.20				Average	
		96+00.00	931	788,438.2	840,837.4	1,400.00				Average	
		92+00.00	930	788,191.9	841,152.6	1,400.00				Average	
		88+00.00	929	787,945.6	841,467.8	1,398.20				Average	
		point1141	1141	787,820.8	841,624.5	1,397.20					
SR24_EB4_1st_GPLane-2-2-2	12.0	point1184	1184	788,493.5	840,626.8	1,399.10				Average	
		100+00.00	677	788,616.6	840,469.2	1,398.20				Average	
		104+00.00	678	788,862.9	840,154.0	1,396.70				Average	
		108+00.00	679	789,109.2	839,838.8	1,400.30				Average	
		112+00.00	680	789,355.4	839,523.6	1,410.00				Average	
		116+00.00	681	789,611.2	839,211.8	1,420.50				Average	
		120+00.00	682	789,882.9	838,913.6	1,425.50				Average	
		124+00.00	683	790,169.9	838,630.0	1,423.30				Average	
		128+00.00	684	790,471.4	838,361.9	1,415.50				Average	
		132+00.00	685	790,786.5	838,109.9	1,407.50				Average	

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		136+00.00	686	791,114.3	837,874.7	1,403.20				Average
		140+00.00	687	791,454.0	837,657.0	1,403.80				Average
		144+00.00	688	791,804.6	837,457.4	1,405.80				Average
		148+00.00	689	792,165.2	837,276.4	1,407.80				Average
		152+00.00	690	792,534.8	837,114.5	1,409.80				Average
		156+00.00	691	792,912.3	836,972.2	1,411.80				
SR24_EB_2nd_GPLane-2-2-2	12.0	point1185	1185	788,503.0	840,634.2	1,399.10				Average
		100+00.00	592	788,626.1	840,476.6	1,398.20				Average
		104+00.00	593	788,872.4	840,161.4	1,396.70				Average
		108+00.00	594	789,118.6	839,846.2	1,400.30				Average
		112+00.00	595	789,364.9	839,531.0	1,410.00				Average
		116+00.00	596	789,620.2	839,219.6	1,420.50				Average
		120+00.00	597	789,891.6	838,921.9	1,425.50				Average
		124+00.00	598	790,178.2	838,638.8	1,423.30				Average
		128+00.00	599	790,479.1	838,371.0	1,415.50				Average
		132+00.00	600	790,793.7	838,119.4	1,407.50				Average
		136+00.00	601	791,121.1	837,884.6	1,403.20				Average
		140+00.00	602	791,460.2	837,667.3	1,403.80				Average
		144+00.00	603	791,810.3	837,468.0	1,405.80				Average
		148+00.00	604	792,170.3	837,287.3	1,407.80				Average
		152+00.00	605	792,539.3	837,125.6	1,409.80				Average
		156+00.00	606	792,916.3	836,983.6	1,411.80				
SR24_EB_3rd_GPLane-2-2-2	12.0	point1186	1186	788,512.5	840,641.6	1,399.10				Average
		100+00.00	507	788,635.6	840,484.0	1,398.20				Average
		104+00.00	508	788,881.8	840,168.8	1,396.70				Average
		108+00.00	509	789,128.1	839,853.6	1,400.30				Average
		112+00.00	510	789,374.4	839,538.4	1,410.00				Average
		116+00.00	511	789,629.3	839,227.5	1,420.50				Average
		120+00.00	512	789,900.2	838,930.2	1,425.50				Average
		124+00.00	513	790,186.4	838,647.5	1,423.30				Average
		128+00.00	514	790,486.9	838,380.2	1,415.50				Average
		132+00.00	515	790,801.0	838,129.0	1,407.50				Average
		136+00.00	516	791,127.8	837,894.6	1,403.20				Average
		140+00.00	517	791,466.4	837,677.5	1,403.80				Average
		144+00.00	518	791,816.0	837,478.6	1,405.80				Average
		148+00.00	519	792,175.4	837,298.1	1,407.80				Average
		152+00.00	520	792,543.8	837,136.8	1,409.80				Average
		156+00.00	521	792,920.2	836,994.9	1,411.80				
SR24_EB_4th_GPLane-2-2-2	12.0	point1187	1187	788,521.9	840,649.0	1,399.10				Average
		100+00.00	194	788,645.0	840,491.4	1,398.20				Average

INPUT: ROADWAYS

SR24 Ellsworth Rd - Ironwood Rd

		104+00.00	195	788,891.3	840,176.2	1,396.70				Average
		108+00.00	196	789,137.5	839,861.0	1,400.30				Average
		112+00.00	197	789,383.8	839,545.8	1,410.00				Average
		116+00.00	198	789,638.4	839,235.3	1,420.50				Average
		120+00.00	199	789,908.9	838,938.5	1,425.50				Average
		124+00.00	200	790,194.6	838,656.3	1,423.30				Average
		128+00.00	201	790,494.6	838,389.4	1,415.50				Average
		132+00.00	202	790,808.2	838,138.6	1,407.50				Average
		136+00.00	203	791,134.5	837,904.5	1,403.20				Average
		140+00.00	204	791,472.6	837,687.8	1,403.80				Average
		144+00.00	205	791,821.6	837,489.1	1,405.80				Average
		148+00.00	206	792,180.5	837,309.0	1,407.80				Average
		152+00.00	207	792,548.4	837,147.9	1,409.80				Average
		156+00.00	208	792,924.1	837,006.2	1,411.80				
SR24_EB_HOV-2-2-2	20.0	point1188	1188	788,531.4	840,656.4	1,399.10				Average
		100+00.00	109	788,654.5	840,498.8	1,398.20				Average
		104+00.00	110	788,900.7	840,183.6	1,396.70				Average
		108+00.00	111	789,147.0	839,868.4	1,400.30				Average
		112+00.00	112	789,393.3	839,553.2	1,410.00				Average
		116+00.00	113	789,647.5	839,243.2	1,420.50				Average
		120+00.00	114	789,917.5	838,946.8	1,425.50				Average
		124+00.00	115	790,202.8	838,665.0	1,423.30				Average
		128+00.00	116	790,502.4	838,398.6	1,415.50				Average
		132+00.00	117	790,815.5	838,148.1	1,407.50				Average
		136+00.00	118	791,141.3	837,914.4	1,403.20				Average
		140+00.00	119	791,478.8	837,698.1	1,403.80				Average
		144+00.00	120	791,827.3	837,499.7	1,405.80				Average
		148+00.00	121	792,185.6	837,319.9	1,407.80				Average
		152+00.00	122	792,552.9	837,159.0	1,409.80				Average
		156+00.00	123	792,928.1	837,017.6	1,411.80				
Ellsworth RampC_ZOI(2)	24.0	point1193	1193	786,210.8	843,527.2	1,387.50				Average
		1+00.00	1189	786,113.8	843,551.2	1,388.40				
Ellsworth RampC_ZOI(1)	24.0	point1194	1194	786,651.9	843,306.1	1,389.50				Average
		6+00.00	459	786,576.4	843,371.5	1,388.90				Average
		4+00.00	458	786,401.6	843,467.9	1,387.80				Average
		2+00.00	457	786,210.8	843,527.2	1,387.50				
Ellsworth RampB_ZOI(2)	24.0	point1196	1196	785,879.6	842,897.9	1,385.45				Average
		26+00.00	454	785,976.7	842,873.7	1,385.80				
Ellsworth RampB_ZOI(1)	24.0	point1197	1197	785,421.2	843,089.1	1,380.60				Average
		22+00.00	452	785,595.0	842,990.5	1,382.30				Average

**INPUT: ROADWAYS**

**SR24 Ellsworth Rd - Ironwood Rd**

		24+00.00	453	785,782.6	842,922.0	1,385.10				Average	
		point1195	1195	785,879.6	842,897.9	1,385.45					
WilliamField_RampC_ZOI(2)	24.0	point1202	1202	790,262.5	838,895.3	1,398.50				Average	
		point1198	1198	790,193.0	838,967.2	1,398.50					
WilliamField_RampC_ZOI(1)	24.0	point1204	1204	790,611.2	838,537.0	1,403.00				Average	
		6+00.00	1022	790,540.5	838,607.7	1,401.80				Average	
		4+00.00	1021	790,401.5	838,751.5	1,399.30				Average	
		2+00.00	1020	790,262.5	838,895.3	1,398.50					
WilliamField_RampB_ZOI(2)	24.0	point1205	1205	789,648.4	838,974.5	1,396.75				Average	
		22+00.00	1017	789,718.0	838,902.6	1,396.50					
WilliamField_RampB_ZOI(1)	24.0	point1206	1206	789,319.3	839,350.0	1,397.40				Average	
		18+00.00	1015	789,442.1	839,192.2	1,396.00				Average	
		20+00.00	1016	789,578.9	839,046.4	1,397.00				Average	
		point1201	1201	789,648.4	838,974.5	1,396.75					

INPUT: TRAFFIC FOR LAeq1h Volumes

SR24 Ellsworth Rd - Ironwood Rd

AZTEC Engineering		30 August 2019										
AZTEC Engineering		TNM 2.5										
INPUT: TRAFFIC FOR LAeq1h Volumes												
PROJECT/CONTRACT:		SR24 Ellsworth Rd - Ironwood Rd										
RUN:		SR24, 2040 Ultimate Condition										
Roadway	Points											
Name	Name	No.	Segment		MTrucks		HTrucks		Buses		Motorcycles	
			Autos		V	S	V	S	V	S	V	S
			V	S	veh/hr	mph	veh/hr	mph	veh/hr	mph	veh/hr	mph
Ellsworth RampA	27+42.33	440	2184	55	71	55	32	55	0	0	0	0
	26+00.00	439	2184	55	71	55	32	55	0	0	0	0
	24+00.00	438	2184	55	71	55	32	55	0	0	0	0
	22+00.00	437	2184	55	71	55	32	55	0	0	0	0
	20+00.00	436	2184	55	71	55	32	55	0	0	0	0
	18+00.00	435	2184	55	71	55	32	55	0	0	0	0
	16+00.00	434	2184	55	71	55	32	55	0	0	0	0
	14+00.00	433	2184	55	71	55	32	55	0	0	0	0
	12+00.00	432	2184	55	71	55	32	55	0	0	0	0
	10+00.00	431	2184	55	71	55	32	55	0	0	0	0
	8+00.00	430	2184	55	71	55	32	55	0	0	0	0
	6+00.00	429	2184	55	71	55	32	55	0	0	0	0
	4+00.00	428	2184	55	71	55	32	55	0	0	0	0
	2+00.00	427	2184	55	71	55	32	55	0	0	0	0
	0+00.00	426										
Ellsworth RampB	0+00.00	441	1988	55	69	55	33	55	0	0	0	0
	2+00.00	442	1988	55	69	55	33	55	0	0	0	0
	4+00.00	443	1988	55	69	55	33	55	0	0	0	0
	6+00.00	444	1988	55	69	55	33	55	0	0	0	0
	8+00.00	445	1988	55	69	55	33	55	0	0	0	0
	10+00.00	446	1988	55	69	55	33	55	0	0	0	0
	12+00.00	447	1988	55	69	55	33	55	0	0	0	0
	14+00.00	448	1988	55	69	55	33	55	0	0	0	0
	16+00.00	449	1988	55	69	55	33	55	0	0	0	0
	18+00.00	450	1988	55	69	55	33	55	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	20+00.00	451										
Ellsworth RampC	27+57.73	470	258	55	4	55	2	55	0	0	0	0
	26+00.00	469	258	55	4	55	2	55	0	0	0	0
	24+00.00	468	258	55	4	55	2	55	0	0	0	0
	22+00.00	467	258	55	4	55	2	55	0	0	0	0
	20+00.00	466	258	55	4	55	2	55	0	0	0	0
	18+00.00	465	258	55	4	55	2	55	0	0	0	0
	16+00.00	464	258	55	4	55	2	55	0	0	0	0
	14+00.00	463	258	55	4	55	2	55	0	0	0	0
	12+00.00	462	258	55	4	55	2	55	0	0	0	0
	10+00.00	461	258	55	4	55	2	55	0	0	0	0
	8+00.00	460	258	55	4	55	2	55	0	0	0	0
	point1192	1192										
Ellsworth RampD	0+00.00	471	239	55	4	55	2	55	0	0	0	0
	2+00.00	472	239	55	4	55	2	55	0	0	0	0
	4+00.00	473	239	55	4	55	2	55	0	0	0	0
	6+00.00	474	239	55	4	55	2	55	0	0	0	0
	8+00.00	475	239	55	4	55	2	55	0	0	0	0
	10+00.00	476	239	55	4	55	2	55	0	0	0	0
	12+00.00	477	239	55	4	55	2	55	0	0	0	0
	14+00.00	478	239	55	4	55	2	55	0	0	0	0
	16+00.00	479	239	55	4	55	2	55	0	0	0	0
	18+00.00	480	239	55	4	55	2	55	0	0	0	0
	20+00.00	481	239	55	4	55	2	55	0	0	0	0
	22+00.00	482										
WilliamField_RampA	20+93.48	1005	715	55	18	55	4	55	0	0	0	0
	20+00.00	1004	715	55	18	55	4	55	0	0	0	0
	18+00.00	1003	715	55	18	55	4	55	0	0	0	0
	16+00.00	1002	715	55	18	55	4	55	0	0	0	0
	14+00.00	1001	715	55	18	55	4	55	0	0	0	0
	12+00.00	1000	715	55	18	55	4	55	0	0	0	0
	10+00.00	999	715	55	18	55	4	55	0	0	0	0
	8+00.00	998	715	55	18	55	4	55	0	0	0	0
	6+00.00	997	715	55	18	55	4	55	0	0	0	0
	4+00.00	996	715	55	18	55	4	55	0	0	0	0
	2+00.00	995	715	55	18	55	4	55	0	0	0	0
	0+00.00	994										



**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

WilliamField_RampB	1+00.00	1006	621	55	16	55	3	55	0	0	0	0
	2+00.00	1007	621	55	16	55	3	55	0	0	0	0
	4+00.00	1008	621	55	16	55	3	55	0	0	0	0
	6+00.00	1009	621	55	16	55	3	55	0	0	0	0
	8+00.00	1010	621	55	16	55	3	55	0	0	0	0
	10+00.00	1011	621	55	16	55	3	55	0	0	0	0
	12+00.00	1012	621	55	16	55	3	55	0	0	0	0
	14+00.00	1013	621	55	16	55	3	55	0	0	0	0
	16+00.00	1014										
WilliamField_RampC	26+85.87	1033	6	55	0	0	0	0	0	0	0	0
	26+00.00	1032	6	55	0	0	0	0	0	0	0	0
	24+00.00	1031	6	55	0	0	0	0	0	0	0	0
	22+00.00	1030	6	55	0	0	0	0	0	0	0	0
	20+00.00	1029	6	55	0	0	0	0	0	0	0	0
	18+00.00	1028	6	55	0	0	0	0	0	0	0	0
	16+00.00	1027	6	55	0	0	0	0	0	0	0	0
	14+00.00	1026	6	55	0	0	0	0	0	0	0	0
	12+00.00	1025	6	55	0	0	0	0	0	0	0	0
	10+00.00	1024	6	55	0	0	0	0	0	0	0	0
	8+00.00	1023	6	55	0	0	0	0	0	0	0	0
	point1203	1203										
WilliamField_RampD	0+00.00	1034	7	55	0	0	0	0	0	0	0	0
	2+00.00	1035	7	55	0	0	0	0	0	0	0	0
	4+00.00	1036	7	55	0	0	0	0	0	0	0	0
	6+00.00	1037	7	55	0	0	0	0	0	0	0	0
	8+00.00	1038	7	55	0	0	0	0	0	0	0	0
	10+00.00	1039	7	55	0	0	0	0	0	0	0	0
	12+00.00	1040	7	55	0	0	0	0	0	0	0	0
	14+00.00	1041	7	55	0	0	0	0	0	0	0	0
	16+00.00	1042	7	55	0	0	0	0	0	0	0	0
	18+00.00	1043	7	55	0	0	0	0	0	0	0	0
	20+00.00	1044	7	55	0	0	0	0	0	0	0	0
	22+00.00	1045	7	55	0	0	0	0	0	0	0	0
	24+00.00	1046	7	55	0	0	0	0	0	0	0	0
	24+33.79	1047										
SR24_WB_1st_GPlane	156+00.00	293	918	70	50	70	28	70	0	0	0	0
	152+00.00	292	918	70	50	70	28	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	148+00.00	291	918	70	50	70	28	70	0	0	0	0
	144+00.00	290	918	70	50	70	28	70	0	0	0	0
	140+00.00	289	918	70	50	70	28	70	0	0	0	0
	136+00.00	288	918	70	50	70	28	70	0	0	0	0
	132+00.00	287	918	70	50	70	28	70	0	0	0	0
	128+00.00	286	918	70	50	70	28	70	0	0	0	0
	124+00.00	285	918	70	50	70	28	70	0	0	0	0
	120+00.00	284	918	70	50	70	28	70	0	0	0	0
	116+00.00	283	918	70	50	70	28	70	0	0	0	0
	112+00.00	282	918	70	50	70	28	70	0	0	0	0
	108+00.00	281	918	70	50	70	28	70	0	0	0	0
	104+00.00	280	918	70	50	70	28	70	0	0	0	0
	100+00.00	279										
SR24_WB_2nd_GPLane	156+00.00	378	760	70	53	70	30	70	0	0	0	0
	152+00.00	377	760	70	53	70	30	70	0	0	0	0
	148+00.00	376	760	70	53	70	30	70	0	0	0	0
	144+00.00	375	760	70	53	70	30	70	0	0	0	0
	140+00.00	374	760	70	53	70	30	70	0	0	0	0
	136+00.00	373	760	70	53	70	30	70	0	0	0	0
	132+00.00	372	760	70	53	70	30	70	0	0	0	0
	128+00.00	371	760	70	53	70	30	70	0	0	0	0
	124+00.00	370	760	70	53	70	30	70	0	0	0	0
	120+00.00	369	760	70	53	70	30	70	0	0	0	0
	116+00.00	368	760	70	53	70	30	70	0	0	0	0
	112+00.00	367	760	70	53	70	30	70	0	0	0	0
	108+00.00	366	760	70	53	70	30	70	0	0	0	0
	104+00.00	365	760	70	53	70	30	70	0	0	0	0
	100+00.00	364										
SR24_WB_3rd_GPLane	156+00.00	776	791	70	13	70	7	70	0	0	0	0
	152+00.00	775	791	70	13	70	7	70	0	0	0	0
	148+00.00	774	791	70	13	70	7	70	0	0	0	0
	144+00.00	773	791	70	13	70	7	70	0	0	0	0
	140+00.00	772	791	70	13	70	7	70	0	0	0	0
	136+00.00	771	791	70	13	70	7	70	0	0	0	0
	132+00.00	770	791	70	13	70	7	70	0	0	0	0
	128+00.00	769	791	70	13	70	7	70	0	0	0	0
	124+00.00	768	791	70	13	70	7	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	120+00.00	767	791	70	13	70	7	70	0	0	0	0
	116+00.00	766	791	70	13	70	7	70	0	0	0	0
	112+00.00	765	791	70	13	70	7	70	0	0	0	0
	108+00.00	764	791	70	13	70	7	70	0	0	0	0
	104+00.00	763	791	70	13	70	7	70	0	0	0	0
	100+00.00	762										
SR24_WB_4th_GPLane	156+00.00	861	380	70	3	70	2	70	0	0	0	0
	152+00.00	860	380	70	3	70	2	70	0	0	0	0
	148+00.00	859	380	70	3	70	2	70	0	0	0	0
	144+00.00	858	380	70	3	70	2	70	0	0	0	0
	140+00.00	857	380	70	3	70	2	70	0	0	0	0
	136+00.00	856	380	70	3	70	2	70	0	0	0	0
	132+00.00	855	380	70	3	70	2	70	0	0	0	0
	128+00.00	854	380	70	3	70	2	70	0	0	0	0
	124+00.00	853	380	70	3	70	2	70	0	0	0	0
	120+00.00	852	380	70	3	70	2	70	0	0	0	0
	116+00.00	851	380	70	3	70	2	70	0	0	0	0
	112+00.00	850	380	70	3	70	2	70	0	0	0	0
	108+00.00	849	380	70	3	70	2	70	0	0	0	0
	104+00.00	848	380	70	3	70	2	70	0	0	0	0
	100+00.00	847										
SR24_WB_HOV	156+00.00	946	316	70	2	70	1	70	0	0	0	0
	152+00.00	945	316	70	2	70	1	70	0	0	0	0
	148+00.00	944	316	70	2	70	1	70	0	0	0	0
	144+00.00	943	316	70	2	70	1	70	0	0	0	0
	140+00.00	942	316	70	2	70	1	70	0	0	0	0
	136+00.00	941	316	70	2	70	1	70	0	0	0	0
	132+00.00	940	316	70	2	70	1	70	0	0	0	0
	128+00.00	939	316	70	2	70	1	70	0	0	0	0
	124+00.00	938	316	70	2	70	1	70	0	0	0	0
	120+00.00	937	316	70	2	70	1	70	0	0	0	0
	116+00.00	936	316	70	2	70	1	70	0	0	0	0
	112+00.00	935	316	70	2	70	1	70	0	0	0	0
	108+00.00	934	316	70	2	70	1	70	0	0	0	0
	104+00.00	933	316	70	2	70	1	70	0	0	0	0
	100+00.00	932										
SR24_EB_HOV	28+00.00	1054	560	70	4	70	2	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	32+00.00	92	560	70	4	70	2	70	0	0	0	0
	36+00.00	93	560	70	4	70	2	70	0	0	0	0
	38+00.00	1153										
SR24_EB_4th_GPLane	28+00.00	1055	673	70	6	70	3	70	0	0	0	0
	32+00.00	177	673	70	6	70	3	70	0	0	0	0
	36+00.00	178	673	70	6	70	3	70	0	0	0	0
	38+00.00	1154										
SR24_EB_3rd_GPLane	28+00.00	1056	1403	70	23	70	11	70	0	0	0	0
	32+00.00	490	1403	70	23	70	11	70	0	0	0	0
	36+00.00	491	1403	70	23	70	11	70	0	0	0	0
	38+00.00	1155										
SR24_EB_2nd_GPLane	28+00.00	1057	1346	70	91	70	45	70	0	0	0	0
	32+00.00	575	1346	70	91	70	45	70	0	0	0	0
	36+00.00	576	1346	70	91	70	45	70	0	0	0	0
	38+00.00	1156										
SR24_EB4_1st_GPLane	28+00.00	1058	1627	70	87	70	43	70	0	0	0	0
	32+00.00	660	1627	70	87	70	43	70	0	0	0	0
	36+00.00	661	1627	70	87	70	43	70	0	0	0	0
	38+00.00	1157										
Ramp NE	92+20.61	1117	3814	55	150	55	81	55	0	0	0	0
	92+00.00	1116	3814	55	150	55	81	55	0	0	0	0
	90+00.00	1115	3814	55	150	55	81	55	0	0	0	0
	88+00.00	1114	3814	55	150	55	81	55	0	0	0	0
	86+00.00	1113	3814	55	150	55	81	55	0	0	0	0
	84+00.00	1112	3814	55	150	55	81	55	0	0	0	0
	82+00.00	1111	3814	55	150	55	81	55	0	0	0	0
	80+00.00	1110	3814	55	150	55	81	55	0	0	0	0
	78+00.00	1109	3814	55	150	55	81	55	0	0	0	0
	76+00.00	1108	3814	55	150	55	81	55	0	0	0	0
	74+00.00	1107	3814	55	150	55	81	55	0	0	0	0
	72+00.00	1106	3814	55	150	55	81	55	0	0	0	0
	70+00.00	1105	3814	55	150	55	81	55	0	0	0	0
	68+00.00	1104	3814	55	150	55	81	55	0	0	0	0
	66+00.00	1103	3814	55	150	55	81	55	0	0	0	0
	64+00.00	1102	3814	55	150	55	81	55	0	0	0	0
	62+00.00	1118										
Ellsworth Rd NB	7+15.02	1123	1249	50	38	50	17	50	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	5+87.48	1122	1249	50	38	50	17	50	0	0	0	0
	3+39.37	1121	1249	50	38	50	17	50	0	0	0	0
	1+75.77	1120	1249	50	38	50	17	50	0	0	0	0
	0+00.00	1119										
Ellsworth Rd SB	7+14.91	1128	1520	50	22	50	9	50	0	0	0	0
	5+60.60	1127	1520	50	22	50	9	50	0	0	0	0
	4+04.24	1126	1520	50	22	50	9	50	0	0	0	0
	1+59.42	1125	1520	50	22	50	9	50	0	0	0	0
	0+00.00	1124										
SR24_WB_3rd_GPLane-2	34+00.00	1161	1449	70	23	70	12	70	0	0	0	0
	32+00.00	745	1449	70	23	70	12	70	0	0	0	0
	28+00.00	1050										
SR24_WB_4th_GPLane-2	34+00.00	1162	695	70	6	70	3	70	0	0	0	0
	32+00.00	830	695	70	6	70	3	70	0	0	0	0
	28+00.00	1051										
SR24_WB_HOV-2	34+00.00	1163	578	70	4	70	2	70	0	0	0	0
	32+00.00	915	578	70	4	70	2	70	0	0	0	0
	28+00.00	1052										
SR24_EB_HOV-2	38+00.00	1164	362	70	2	70	1	70	0	0	0	0
	40+00.00	94	362	70	2	70	1	70	0	0	0	0
	44+00.00	95	362	70	2	70	1	70	0	0	0	0
	48+00.00	96	362	70	2	70	1	70	0	0	0	0
	52+00.00	97	362	70	2	70	1	70	0	0	0	0
	56+00.00	98	362	70	2	70	1	70	0	0	0	0
	60+00.00	99	362	70	2	70	1	70	0	0	0	0
	64+00.00	100	362	70	2	70	1	70	0	0	0	0
	68+00.00	101	362	70	2	70	1	70	0	0	0	0
	72+00.00	102	362	70	2	70	1	70	0	0	0	0
	76+00.00	103	362	70	2	70	1	70	0	0	0	0
	80+00.00	104	362	70	2	70	1	70	0	0	0	0
	84+00.00	105	362	70	2	70	1	70	0	0	0	0
	86+00.00	1142										
SR24_EB_4th_GPLane-2	38+00.00	1165	435	70	4	70	2	70	0	0	0	0
	40+00.00	179	435	70	4	70	2	70	0	0	0	0
	44+00.00	180	435	70	4	70	2	70	0	0	0	0
	48+00.00	181	435	70	4	70	2	70	0	0	0	0
	52+00.00	182	435	70	4	70	2	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	56+00.00	183	435	70	4	70	2	70	0	0	0	0
	60+00.00	184	435	70	4	70	2	70	0	0	0	0
	64+00.00	185	435	70	4	70	2	70	0	0	0	0
	68+00.00	186	435	70	4	70	2	70	0	0	0	0
	72+00.00	187	435	70	4	70	2	70	0	0	0	0
	76+00.00	188	435	70	4	70	2	70	0	0	0	0
	80+00.00	189	435	70	4	70	2	70	0	0	0	0
	84+00.00	190	435	70	4	70	2	70	0	0	0	0
	86+00.00	1143										
SR24_EB_3rd_GPLane-2	38+00.00	1166	907	70	15	70	8	70	0	0	0	0
	40+00.00	492	907	70	15	70	8	70	0	0	0	0
	44+00.00	493	907	70	15	70	8	70	0	0	0	0
	48+00.00	494	907	70	15	70	8	70	0	0	0	0
	52+00.00	495	907	70	15	70	8	70	0	0	0	0
	56+00.00	496	907	70	15	70	8	70	0	0	0	0
	60+00.00	497	907	70	15	70	8	70	0	0	0	0
	64+00.00	498	907	70	15	70	8	70	0	0	0	0
	68+00.00	499	907	70	15	70	8	70	0	0	0	0
	72+00.00	500	907	70	15	70	8	70	0	0	0	0
	76+00.00	501	907	70	15	70	8	70	0	0	0	0
	80+00.00	502	907	70	15	70	8	70	0	0	0	0
	84+00.00	503	907	70	15	70	8	70	0	0	0	0
	86+00.00	1144										
SR24_EB_2nd_GPLane-2	38+00.00	1167	871	70	59	70	31	70	0	0	0	0
	40+00.00	577	871	70	59	70	31	70	0	0	0	0
	44+00.00	578	871	70	59	70	31	70	0	0	0	0
	48+00.00	579	871	70	59	70	31	70	0	0	0	0
	52+00.00	580	871	70	59	70	31	70	0	0	0	0
	56+00.00	581	871	70	59	70	31	70	0	0	0	0
	60+00.00	582	871	70	59	70	31	70	0	0	0	0
	64+00.00	583	871	70	59	70	31	70	0	0	0	0
	68+00.00	584	871	70	59	70	31	70	0	0	0	0
	72+00.00	585	871	70	59	70	31	70	0	0	0	0
	76+00.00	586	871	70	59	70	31	70	0	0	0	0
	80+00.00	587	871	70	59	70	31	70	0	0	0	0
	84+00.00	588	871	70	59	70	31	70	0	0	0	0
	86+00.00	1145										

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

SR24_EB4_1st_GPLane-2	38+00.00	1168	1052	70	56	70	29	70	0	0	0	0
	40+00.00	662	1052	70	56	70	29	70	0	0	0	0
	44+00.00	663	1052	70	56	70	29	70	0	0	0	0
	48+00.00	664	1052	70	56	70	29	70	0	0	0	0
	52+00.00	665	1052	70	56	70	29	70	0	0	0	0
	56+00.00	666	1052	70	56	70	29	70	0	0	0	0
	60+00.00	667	1052	70	56	70	29	70	0	0	0	0
	64+00.00	668	1052	70	56	70	29	70	0	0	0	0
	68+00.00	669	1052	70	56	70	29	70	0	0	0	0
	72+00.00	670	1052	70	56	70	29	70	0	0	0	0
	76+00.00	671	1052	70	56	70	29	70	0	0	0	0
	80+00.00	672	1052	70	56	70	29	70	0	0	0	0
	84+00.00	673	1052	70	56	70	29	70	0	0	0	0
	86+00.00	1146										
SR24_WB_1st_GPLane-2	point1169	1169	1049	70	57	70	29	70	0	0	0	0
	84+00.00	275	1049	70	57	70	29	70	0	0	0	0
	80+00.00	274	1049	70	57	70	29	70	0	0	0	0
	76+00.00	273	1049	70	57	70	29	70	0	0	0	0
	72+00.00	272	1049	70	57	70	29	70	0	0	0	0
	68+00.00	271	1049	70	57	70	29	70	0	0	0	0
	64+00.00	270	1049	70	57	70	29	70	0	0	0	0
	60+00.00	269	1049	70	57	70	29	70	0	0	0	0
	92+20.61	268										
SR24_WB_2nd_GPLane-2	point1170	1170	868	70	60	70	30	70	0	0	0	0
	84+00.00	360	868	70	60	70	30	70	0	0	0	0
	80+00.00	359	868	70	60	70	30	70	0	0	0	0
	76+00.00	358	868	70	60	70	30	70	0	0	0	0
	72+00.00	357	868	70	60	70	30	70	0	0	0	0
	68+00.00	356	868	70	60	70	30	70	0	0	0	0
	64+00.00	355	868	70	60	70	30	70	0	0	0	0
	60+00.00	354	868	70	60	70	30	70	0	0	0	0
	92+20.61	353										
SR24_WB_3rd_GPLane-2	point1171	1171	905	70	15	70	7	70	0	0	0	0
	84+00.00	758	905	70	15	70	7	70	0	0	0	0
	80+00.00	757	905	70	15	70	7	70	0	0	0	0
	76+00.00	756	905	70	15	70	7	70	0	0	0	0
	72+00.00	755	905	70	15	70	7	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	68+00.00	754	905	70	15	70	7	70	0	0	0	0
	64+00.00	753	905	70	15	70	7	70	0	0	0	0
	60+00.00	752	905	70	15	70	7	70	0	0	0	0
	58+66.00	1131	905	70	15	70	7	70	0	0	0	0
	57+33.00	1132	905	70	15	70	7	70	0	0	0	0
	56+00.00	751	905	70	15	70	7	70	0	0	0	0
	52+00.00	750	905	70	15	70	7	70	0	0	0	0
	48+00.00	749	905	70	15	70	7	70	0	0	0	0
	44+00.00	748	905	70	15	70	7	70	0	0	0	0
	40+00.00	747	905	70	15	70	7	70	0	0	0	0
	36+00.00	746	905	70	15	70	7	70	0	0	0	0
	34+00.00	1158										
SR24_WB_4th_GPLane-2	point1172	1172	434	70	4	70	2	70	0	0	0	0
	84+00.00	843	434	70	4	70	2	70	0	0	0	0
	80+00.00	842	434	70	4	70	2	70	0	0	0	0
	76+00.00	841	434	70	4	70	2	70	0	0	0	0
	72+00.00	840	434	70	4	70	2	70	0	0	0	0
	68+00.00	839	434	70	4	70	2	70	0	0	0	0
	64+00.00	838	434	70	4	70	2	70	0	0	0	0
	60+00.00	837	434	70	4	70	2	70	0	0	0	0
	58+66.00	1133	434	70	4	70	2	70	0	0	0	0
	57+33.00	1134	434	70	4	70	2	70	0	0	0	0
	56+00.00	836	434	70	4	70	2	70	0	0	0	0
	52+00.00	835	434	70	4	70	2	70	0	0	0	0
	48+00.00	834	434	70	4	70	2	70	0	0	0	0
	44+00.00	833	434	70	4	70	2	70	0	0	0	0
	40+00.00	832	434	70	4	70	2	70	0	0	0	0
	36+00.00	831	434	70	4	70	2	70	0	0	0	0
	34+00.00	1159										
SR24_WB_HOV-2	point1173	1173	361	70	2	70	1	70	0	0	0	0
	84+00.00	928	361	70	2	70	1	70	0	0	0	0
	80+00.00	927	361	70	2	70	1	70	0	0	0	0
	76+00.00	926	361	70	2	70	1	70	0	0	0	0
	72+00.00	925	361	70	2	70	1	70	0	0	0	0
	68+00.00	924	361	70	2	0	1	70	0	0	0	0
	64+00.00	923	361	70	2	70	1	70	0	0	0	0
	60+00.00	922	361	70	2	70	1	70	0	0	0	0



**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	58+66.00	1135	361	70	2	70	1	70	0	0	0	0
	57+33.00	1136	361	70	2	70	1	70	0	0	0	0
	56+00.00	921	361	70	2	70	1	70	0	0	0	0
	52+00.00	920	361	70	2	70	1	70	0	0	0	0
	48+00.00	919	361	70	2	70	1	70	0	0	0	0
	44+00.00	918	361	70	2	70	1	70	0	0	0	0
	40+00.00	917	361	70	2	70	1	70	0	0	0	0
	36+00.00	916	361	70	2	70	1	70	0	0	0	0
	34+00.00	1160										
SR24_EB_HOV-2-2	point1174	1174	387	70	2	70	1	70	0	0	0	0
	88+00.00	106	387	70	2	70	1	70	0	0	0	0
	92+00.00	107	387	70	2	70	1	70	0	0	0	0
	96+00.00	108	387	70	2	70	1	70	0	0	0	0
	98+00.00	1148										
SR24_EB_4th_GPLane-2-2	point1175	1175	465	70	4	70	2	70	0	0	0	0
	88+00.00	191	465	70	4	70	2	70	0	0	0	0
	92+00.00	192	465	70	4	70	2	70	0	0	0	0
	96+00.00	193	465	70	4	70	2	70	0	0	0	0
	98+00.00	1149										
SR24_EB_3rd_GPLane-2-2	point1176	1176	968	70	15	70	8	70	0	0	0	0
	88+00.00	504	968	70	15	70	8	70	0	0	0	0
	92+00.00	505	968	70	15	70	8	70	0	0	0	0
	96+00.00	506	968	70	15	70	8	70	0	0	0	0
	98+00.00	1150										
SR24_EB_2nd_GPLane-2-2	point1177	1177	930	70	59	70	31	70	0	0	0	0
	88+00.00	589	930	70	59	70	31	70	0	0	0	0
	92+00.00	590	930	70	59	70	31	70	0	0	0	0
	96+00.00	591	930	70	59	70	31	70	0	0	0	0
	98+00.00	1151										
SR24_EB4_1st_GPLane-2-2	point1178	1178	1123	70	56	70	29	70	0	0	0	0
	88+00.00	674	1123	70	56	70	29	70	0	0	0	0
	92+00.00	675	1123	70	56	70	29	70	0	0	0	0
	96+00.00	676	1123	70	56	70	29	70	0	0	0	0
	98+00.00	1152										
SR24_WB_1st_GPLane-2	point1179	1179	1126	70	56	70	29	70	0	0	0	0
	96+00.00	278	1126	70	56	70	29	70	0	0	0	0
	92+00.00	277	1126	70	56	70	29	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	88+00.00	276	1126	70	56	70	29	70	0	0	0	0
	point1137	1137										
SR24_WB_2nd_GPLane-2	point1180	1180	932	70	59	70	31	70	0	0	0	0
	96+00.00	363	932	70	59	70	31	70	0	0	0	0
	92+00.00	362	932	70	59	70	31	70	0	0	0	0
	88+00.00	361	932	70	59	70	31	70	0	0	0	0
	point1138	1138										
SR24_WB_3rd_GPLane-2	point1181	1181	971	70	15	70	8	70	0	0	0	0
	96+00.00	761	971	70	15	70	8	70	0	0	0	0
	92+00.00	760	971	70	15	70	8	70	0	0	0	0
	88+00.00	759	971	70	15	70	8	70	0	0	0	0
	point1139	1139										
SR24_WB_4th_GPLane-2	point1182	1182	466	70	4	70	2	70	0	0	0	0
	96+00.00	846	466	70	4	70	2	70	0	0	0	0
	92+00.00	845	466	70	4	70	2	70	0	0	0	0
	88+00.00	844	466	70	4	70	2	70	0	0	0	0
	point1140	1140										
SR24_WB_HOV-2	point1183	1183	388	70	2	70	1	70	0	0	0	0
	96+00.00	931	388	70	2	70	1	70	0	0	0	0
	92+00.00	930	388	70	2	70	1	70	0	0	0	0
	88+00.00	929	388	70	2	70	1	70	0	0	0	0
	point1141	1141										
SR24_EB4_1st_GPLane-2-2-2	point1184	1184	941	70	52	70	29	70	0	0	0	0
	100+00.00	677	941	70	52	70	29	70	0	0	0	0
	104+00.00	678	941	70	52	70	29	70	0	0	0	0
	108+00.00	679	941	70	52	70	29	70	0	0	0	0
	112+00.00	680	941	70	52	70	29	70	0	0	0	0
	116+00.00	681	941	70	52	70	29	70	0	0	0	0
	120+00.00	682	941	70	52	70	29	70	0	0	0	0
	124+00.00	683	941	70	52	70	29	70	0	0	0	0
	128+00.00	684	941	70	52	70	29	70	0	0	0	0
	132+00.00	685	941	70	52	70	29	70	0	0	0	0
	136+00.00	686	941	70	52	70	29	70	0	0	0	0
	140+00.00	687	941	70	52	70	29	70	0	0	0	0
	144+00.00	688	941	70	52	70	29	70	0	0	0	0
	148+00.00	689	941	70	52	70	29	70	0	0	0	0
	152+00.00	690	941	70	52	70	29	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	156+00.00	691										
SR24_EB_2nd_GPLane-2-2-2	point1185	1185	779	70	54	70	30	70	0	0	0	0
	100+00.00	592	779	70	54	70	30	70	0	0	0	0
	104+00.00	593	779	70	54	70	30	70	0	0	0	0
	108+00.00	594	779	70	54	70	30	70	0	0	0	0
	112+00.00	595	779	70	54	70	30	70	0	0	0	0
	116+00.00	596	779	70	54	70	30	70	0	0	0	0
	120+00.00	597	779	70	54	70	30	70	0	0	0	0
	124+00.00	598	779	70	54	70	30	70	0	0	0	0
	128+00.00	599	779	70	54	70	30	70	0	0	0	0
	132+00.00	600	779	70	54	70	30	70	0	0	0	0
	136+00.00	601	779	70	54	70	30	70	0	0	0	0
	140+00.00	602	779	70	54	70	30	70	0	0	0	0
	144+00.00	603	779	70	54	70	30	70	0	0	0	0
	148+00.00	604	779	70	54	70	30	70	0	0	0	0
	152+00.00	605	779	70	54	70	30	70	0	0	0	0
	156+00.00	606										
SR24_EB_3rd_GPLane-2-2-2	point1186	1186	811	70	13	70	7	70	0	0	0	0
	100+00.00	507	811	70	13	70	7	70	0	0	0	0
	104+00.00	508	811	70	13	70	7	70	0	0	0	0
	108+00.00	509	811	70	13	70	7	70	0	0	0	0
	112+00.00	510	811	70	13	70	7	70	0	0	0	0
	116+00.00	511	811	70	13	70	7	70	0	0	0	0
	120+00.00	512	811	70	13	70	7	70	0	0	0	0
	124+00.00	513	811	70	13	70	7	70	0	0	0	0
	128+00.00	514	811	70	13	70	7	70	0	0	0	0
	132+00.00	515	811	70	13	70	7	70	0	0	0	0
	136+00.00	516	811	70	13	70	7	70	0	0	0	0
	140+00.00	517	811	70	13	70	7	70	0	0	0	0
	144+00.00	518	811	70	13	70	7	70	0	0	0	0
	148+00.00	519	811	70	13	70	7	70	0	0	0	0
	152+00.00	520	811	70	13	70	7	70	0	0	0	0
	156+00.00	521										
SR24_EB_4th_GPLane-2-2-2	point1187	1187	389	70	3	70	2	70	0	0	0	0
	100+00.00	194	389	70	3	70	2	70	0	0	0	0
	104+00.00	195	389	70	3	70	2	70	0	0	0	0
	108+00.00	196	389	70	3	70	2	70	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	112+00.00	197	389	70	3	70	2	70	0	0	0	0
	116+00.00	198	389	70	3	70	2	70	0	0	0	0
	120+00.00	199	389	70	3	70	2	70	0	0	0	0
	124+00.00	200	389	70	3	70	2	70	0	0	0	0
	128+00.00	201	389	70	3	70	2	70	0	0	0	0
	132+00.00	202	389	70	3	70	2	70	0	0	0	0
	136+00.00	203	389	70	3	70	2	70	0	0	0	0
	140+00.00	204	389	70	3	70	2	70	0	0	0	0
	144+00.00	205	389	70	3	70	2	70	0	0	0	0
	148+00.00	206	389	70	3	70	2	70	0	0	0	0
	152+00.00	207	389	70	3	70	2	70	0	0	0	0
	156+00.00	208										
SR24_EB_HOV-2-2-2	point1188	1188	323	70	2	70	1	70	0	0	0	0
	100+00.00	109	323	70	2	70	1	70	0	0	0	0
	104+00.00	110	323	70	2	70	1	70	0	0	0	0
	108+00.00	111	323	70	2	70	1	70	0	0	0	0
	112+00.00	112	323	70	2	70	1	70	0	0	0	0
	116+00.00	113	323	70	2	70	1	70	0	0	0	0
	120+00.00	114	323	70	2	70	1	70	0	0	0	0
	124+00.00	115	323	70	2	70	1	70	0	0	0	0
	128+00.00	116	323	70	2	70	1	70	0	0	0	0
	132+00.00	117	323	70	2	70	1	70	0	0	0	0
	136+00.00	118	323	70	2	70	1	70	0	0	0	0
	140+00.00	119	323	70	2	70	1	70	0	0	0	0
	144+00.00	120	323	70	2	70	1	70	0	0	0	0
	148+00.00	121	323	70	2	70	1	70	0	0	0	0
	152+00.00	122	323	70	2	70	1	70	0	0	0	0
	156+00.00	123										
Ellsworth RampC_ZOI(2)	point1193	1193	258	18	4	13	2	10	0	0	0	0
	1+00.00	1189										
Ellsworth RampC_ZOI(1)	point1194	1194	258	41	4	36	2	33	0	0	0	0
	6+00.00	459	258	41	4	36	2	33	0	0	0	0
	4+00.00	458	258	41	4	36	2	33	0	0	0	0
	2+00.00	457										
Ellsworth RampB_ZOI(2)	point1196	1196	1988	18	69	13	33	10	0	0	0	0
	26+00.00	454										
Ellsworth RampB_ZOI(1)	point1197	1197	1988	41	69	36	33	33	0	0	0	0

**INPUT: TRAFFIC FOR LAeq1h Volumes**

**SR24 Ellsworth Rd - Ironwood Rd**

	22+00.00	452	1988	41	69	36	33	33	0	0	0	0
	24+00.00	453	1988	41	69	36	33	33	0	0	0	0
	point1195	1195										
WilliamField_RampC_ZOI(2)	point1202	1202	6	18	0	0	0	0	0	0	0	0
	point1198	1198										
WilliamField_RampC_ZOI(1)	point1204	1204	6	41	0	0	0	0	0	0	0	0
	6+00.00	1022	6	41	0	0	0	0	0	0	0	0
	4+00.00	1021	6	41	0	0	0	0	0	0	0	0
	2+00.00	1020										
WilliamField_RampB_ZOI(2)	point1205	1205	621	18	16	13	3	10	0	0	0	0
	22+00.00	1017										
WilliamField_RampB_ZOI(1)	point1206	1206	621	41	16	36	3	33	0	0	0	0
	18+00.00	1015	621	41	16	36	3	33	0	0	0	0
	20+00.00	1016	621	41	16	36	3	33	0	0	0	0
	point1201	1201										

INPUT: BARRIERS

SR24 Ellsworth Rd - Ironwood Rd

AZTEC Engineering	30 August 2019
AZTEC Engineering	TNM 2.5

INPUT: BARRIERS

PROJECT/CONTRACT: SR24 Ellsworth Rd - Ironwood Rd  
 RUN: SR24, 2040 Ultimate Condition

Barrier									Points								
Name	Type	Height	If Wall	If Berm		Add'tnl	Name	No.	Coordinates (bottom)			Height	Segment			On	Important
		Min	Max	\$ per	\$ per	Top	Run:Rise	\$ per	X	Y	Z	at	Seg	Ht	Perturbs	Struct?	Reflec-
		ft	ft	\$/sq ft	\$/cu yd	ft	ft:ft	\$/ft	ft	ft	ft	ft	ft	ft			tions?
				Unit	Unit	Width		Unit				Point	Incre-	#Up	#Dn		
				Area	Vol.			Length					ment				
PrivacyWall_1	W	0.00	99.99	0.00				0.00	P1	1	788,451.2	842,765.3	1,399.10	6.00	0.00	0	0
									P2	2	788,296.5	842,765.8	1,398.49	6.00	0.00	0	0
									P3	3	788,296.2	842,661.4	1,399.01	6.00			
ConcreteBarrier_34"high	W	0.00	99.99	0.00				0.00	41+96.92	22	784,349.6	844,290.3	1,410.80	2.83	0.00	0	0
									42+86.61	23	784,417.7	844,233.3	1,411.24	2.83	0.00	0	0
									43+75.47	24	784,486.0	844,178.0	1,411.67	2.83	0.00	0	0
									44+81.20	25	784,568.3	844,113.6	1,412.19	2.83	0.00	0	0
									45+55.58	26	784,627.0	844,069.1	1,412.55	2.83	0.00	0	0
									46+01.32	27	784,663.4	844,042.3	1,412.78	2.83	0.00	0	0
									46+38.95	28	784,693.4	844,020.3	1,412.96	2.83	0.00	0	0
									47+04.89	29	784,746.4	843,982.3	1,413.28	2.83	0.00	0	0
									47+91.18	30	784,816.5	843,933.5	1,413.71	2.83	0.00	0	0
									48+71.72	31	784,882.5	843,889.0	1,414.10	2.83	0.00	0	0
									49+57.53	32	784,953.6	843,842.5	1,414.52	2.83	0.00	0	0
									50+05.72	33	784,993.9	843,817.1	1,414.76	2.83	0.00	0	0
									50+55.01	34	785,035.1	843,791.0	1,415.00	2.83	0.00	0	0
									51+49.76	35	785,115.2	843,742.3	1,415.46	2.83	0.00	0	0
									52+44.93	36	785,196.9	843,693.5	1,415.93	2.83	0.00	0	0
									53+88.41	37	785,320.0	843,619.8	1,416.63	2.83	0.00	0	0
									54+07.22	38	785,336.2	843,610.1	1,416.72	2.83	0.00	0	0
									54+23.55	39	785,350.2	843,601.8	1,416.80	2.83			
MedianBarrier_44"high	W	0.00	99.99	0.00				0.00	28+00.00	54	783,365.1	845,267.6	1,404.00	3.67	0.00	0	0
									32+00.00	55	783,609.5	844,951.0	1,405.90	3.67	0.00	0	0
									36+00.00	56	783,875.4	844,652.3	1,407.90	3.67	0.00	0	0
									40+00.00	57	784,161.5	844,372.9	1,409.80	3.67	0.00	0	0
									44+00.00	58	784,466.4	844,114.1	1,411.80	3.67	0.00	0	0
									48+00.00	59	784,788.6	843,877.2	1,413.80	3.67	0.00	0	0
									52+00.00	60	785,126.4	843,663.1	1,415.70	3.67	0.00	0	0
									56+00.00	61	785,469.6	843,457.7	1,417.70	3.67	0.00	0	0
									60+00.00	62	785,812.9	843,252.4	1,418.10	3.67	0.00	0	0
									64+00.00	63	786,156.2	843,047.1	1,412.50	3.67	0.00	0	0
									68+00.00	64	786,495.2	842,834.8	1,401.90	3.67	0.00	0	0
									72+00.00	65	786,819.0	842,600.1	1,393.80	3.67	0.00	0	0
									76+00.00	66	787,125.6	842,343.4	1,392.20	3.67	0.00	0	0
									78+00.00	68	787,269.6	842,204.6	1,393.20	3.67			
ConcreteBarrier_34"high-2-2	W	0.00	99.99	0.00				0.00	point71	71	785,371.0	843,628.5	1,416.82	2.83	0.00	0	0
									55+44.15	41	785,465.7	843,560.0	1,417.40	2.83	0.00	0	0

INPUT: BARRIERS

SR24 Ellsworth Rd - Ironwood Rd

									56+77.23	42	785,575.8	843,484.8	1,418.05	2.83	0.00	0	0		
									57+76.76	43	785,662.5	843,435.8	1,418.48	2.83	0.00	0	0		
									60+18.99	44	785,873.4	843,316.5	1,417.99	2.83	0.00	0	0	Y	
									61+64.64	45	785,997.8	843,240.8	1,416.56	2.83	0.00	0	0	Y	
									61+76.68	46	786,008.2	843,234.7	1,416.40	2.83	0.00	0	0	Y	
									63+68.75	47	786,173.8	843,137.4	1,413.12	2.83	0.00	0	0	Y	
									65+51.28	48	786,330.9	843,042.8	1,408.65	2.83	0.00	0	0		
									65+75.46	49	786,351.6	843,029.6	1,407.99	2.83	0.00	0	0		
									67+72.27	50	786,519.9	842,922.1	1,402.63	2.83	0.00	0	0		
									69+44.49	51	786,664.0	842,823.0	1,398.24	2.83	0.00	0	0		
									69+69.55	52	786,684.5	842,808.0	1,397.69	2.83	0.00	0	0		
									70+87.69	53	786,781.4	842,737.4	1,395.44	2.83					
PrivacyWall_2	W	0.00	99.99	0.00			0.00	P5	73	788,303.6	842,593.0	1,398.27	6.00	0.00	0	0			
								P6	6	788,303.6	842,283.9	1,397.03	6.00	0.00	0	0			
								P7	7	788,430.7	842,283.9	1,397.45	6.00						
PrivacyWall_3	W	0.00	99.99	0.00			0.00	P8	75	788,317.1	842,213.8	1,396.84	6.00	0.00	0	0			
								P9	9	788,317.4	841,981.9	1,395.87	6.00	0.00	0	0			
								P10	10	788,383.5	841,981.3	1,396.11	6.00						
PrivacyWall_4	W	0.00	99.99	0.00			0.00	P11	77	788,364.5	841,923.3	1,395.90	6.00	0.00	0	0			
								P12	12	788,365.3	841,825.2	1,395.77	6.00	0.00	0	0			
								P13	13	788,575.2	841,827.0	1,396.68	6.00	0.00	0	0			
								P14	14	788,574.4	841,926.5	1,397.08	6.00						
PrivacyWall_5	W	0.00	99.99	0.00			0.00	P14	78	788,650.9	841,920.4	1,397.08	6.00	0.00	0	0			
								P15	15	788,650.4	841,848.0	1,397.06	6.00	0.00	0	0			
								P16	16	788,870.4	841,843.5	1,397.87	6.00	0.00	0	0			
								P17	17	788,870.5	841,925.7	1,398.52	6.00						
PrivacyWall_6	W	0.00	99.99	0.00			0.00	P17	79	788,923.2	841,912.1	1,398.52	6.00	0.00	0	0			
								P18	18	788,923.3	841,815.6	1,398.80	6.00	0.00	0	0			
								P19	19	789,179.3	841,812.8	1,398.93	6.00	0.00	0	0			
								P20	20	789,493.3	841,809.4	1,399.84	6.00	0.00	0	0			
								P21	21	789,494.5	841,918.4	1,400.49	6.00						
FuturePotentialPW	W	0.00	99.99	0.00			0.00	P1	80	786,161.8	844,092.3	1,387.56	6.00	0.00	0	0			
								P2	81	786,161.8	843,963.7	1,387.62	6.00	0.00	0	0			
								P3	82	786,157.0	843,739.8	1,387.14	6.00	0.00	0	0			
								P4	83	786,380.5	843,685.3	1,389.48	6.00	0.00	0	0			
								P5	84	786,545.4	843,644.0	1,390.50	6.00	0.00	0	0			
								P6	85	786,700.4	843,604.6	1,392.11	6.00	0.00	0	0			
								P7	86	786,815.4	843,451.4	1,393.30	6.00	0.00	0	0			
								P8	87	786,915.8	843,314.3	1,394.85	6.00	0.00	0	0			
								P9	88	787,016.3	843,177.1	1,395.71	6.00	0.00	0	0			
								P10	89	787,134.4	843,015.7	1,395.69	6.00	0.00	0	0			
								P11	90	787,252.5	842,854.3	1,395.34	6.00	0.00	0	0			
								P12	91	787,376.6	842,684.9	1,393.81	6.00	0.00	0	0			
								P13	92	787,447.5	842,588.1	1,393.68	6.00	0.00	0	0			
								P14	93	787,542.0	842,459.0	1,393.99	6.00	0.00	0	0			
								P15	94	787,666.0	842,289.5	1,395.04	6.00	0.00	0	0			
								P16	95	787,849.2	842,039.4	1,394.14	6.00	0.00	0	0			
								P17	96	787,996.8	841,837.7	1,393.91	6.00	0.00	0	0			
								P18	97	788,120.9	841,668.2	1,394.43	6.00	0.00	0	0			
								P19	98	788,256.7	841,482.6	1,394.55	6.00	0.00	0	0			

INPUT: BARRIERS

SR24 Ellsworth Rd - Ironwood Rd

									P20	99	788,374.9	841,321.2	1,394.53	6.00	0.00	0	0		
									P21	100	788,429.4	841,247.2	1,394.73	6.00	0.00	0	0		
									P22	101	788,609.2	841,045.7	1,395.05	6.00	0.00	0	0		
									P23	102	788,842.3	840,784.6	1,396.02	6.00	0.00	0	0		
									P24	103	789,035.4	840,568.3	1,396.65	6.00	0.00	0	0		
									P25	104	789,255.2	840,322.1	1,397.15	6.00	0.00	0	0		
									P26	105	789,401.7	840,158.0	1,397.44	6.00	0.00	0	0		
									P27	106	789,554.9	839,986.4	1,397.41	6.00	0.00	0	0		
									P28	107	789,714.7	839,807.4	1,397.41	6.00	0.00	0	0		
									P29	108	789,914.5	839,583.6	1,397.87	6.00	0.00	0	0		
									P30	109	790,081.0	839,397.1	1,398.17	6.00	0.00	0	0		
									P31	110	790,232.7	839,233.4	1,399.09	6.00	0.00	0	0		
									P32	111	790,358.2	839,279.7	1,399.54	6.00	0.00	0	0		
									P33	112	790,577.3	839,353.3	1,399.70	6.00					



**INPUT: RECEIVERS**

**SR24 Ellsworth Rd - Ironwood Rd**

AZTEC Engineering							30 August 2019				
AZTEC Engineering							TNM 2.5				
INPUT: RECEIVERS											
PROJECT/CONTRACT:		SR24 Ellsworth Rd - Ironwood Rd									
RUN:		SR24, 2040 Ultimate Condition									
Receiver											
Name	No.	#DUs	Coordinates (ground)			Height above Ground	Input Sound Levels and Criteria			NR Goal	Active in Calc.
			X	Y	Z		Existing LAeq1h	Impact LAeq1h	Criteria Sub'l		
			ft	ft	ft	ft	dBA	dBA	dB	dB	
R1	1	10	786,331.2	843,997.5	1,387.71	5.00	0.00	66	10.0	8.0	Y
R2	2	10	786,703.9	843,902.9	1,391.52	5.00	0.00	66	10.0	8.0	
R3	3	10	787,021.7	843,673.2	1,394.33	5.00	0.00	66	15.0	7.0	
R4	4	10	787,279.8	843,308.1	1,397.46	5.00	0.00	66	15.0	7.0	
R5	5	10	787,733.4	842,688.4	1,395.65	5.00	0.00	66	15.0	7.0	
R6	6	10	787,924.0	842,428.1	1,395.88	5.00	0.00	66	15.0	7.0	
R7	7	10	788,212.1	842,034.6	1,395.64	5.00	0.00	66	15.0	7.0	
R8	8	4	788,328.2	842,557.3	1,398.42	5.00	0.00	66	15.0	7.0	
R9	9	4	788,323.4	842,313.2	1,397.23	5.00	0.00	66	15.0	7.0	
R10	10	4	788,347.4	842,028.4	1,396.07	5.00	0.00	66	15.0	7.0	
R11	11	2	788,377.2	841,845.2	1,395.74	5.00	0.00	66	15.0	7.0	
R12	12	3	788,560.8	841,846.9	1,396.71	5.00	0.00	66	15.0	7.0	
R13	13	4	788,755.6	841,862.9	1,397.56	5.00	0.00	66	15.0	7.0	
R14	14	3	788,945.6	841,839.6	1,398.54	5.00	0.00	66	15.0	7.0	
R15	15	4	788,758.4	841,970.9	1,398.03	5.00	0.00	66	15.0	7.0	
R16	16	4	788,460.4	842,088.6	1,396.84	5.00	0.00	66	15.0	7.0	
R17	17	10	788,519.7	841,614.4	1,395.91	5.00	0.00	66	15.0	7.0	
R18	18	10	788,774.1	841,298.2	1,396.26	5.00	0.00	66	15.0	7.0	
R19	19	10	789,049.9	840,992.9	1,396.59	5.00	0.00	66	15.0	7.0	
R20	20	10	789,324.6	840,688.8	1,397.70	5.00	0.00	66	15.0	7.0	
R21	21	10	789,594.1	840,390.4	1,398.35	5.00	0.00	66	15.0	7.0	
R22	22	10	789,869.6	840,085.5	1,398.59	5.00	0.00	66	15.0	7.0	
R23	23	10	790,153.6	839,771.1	1,399.16	5.00	0.00	66	15.0	7.0	