

JUNE 2022

# Feasibility Study Report

*El Mirage Road: SR303L to  
Jomax Road Feasibility Study*





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## El Mirage Road

SR 303L to Jomax Road Feasibility Study

### 1. Introduction

As growth occurs in the area surrounding the State Route 303 Loop (SR 303L) and El Mirage Road Traffic Interchange (TI), and in nearby west Maricopa County communities, the existing roadway network will need to expand to serve this growth. Regional travel demand models (TDM) identify a continuous extension of El Mirage Road from SR 303L to Jomax Road by 2040. There have been previous studies that recommend a six-lane urban principal arterial roadway for El Mirage Road with a conceptual layout, and the City of Peoria General Plan 2040 (December 2020) identifies El Mirage Road as a future arterial between SR 303L and Jomax Road. The current MAG Transportation Improvement Program (TIP) identifies local funding (Maricopa County) for design, right-of-way (ROW) acquisition and construction in Fiscal Years (FY) 2023, 2024, and 2025, respectively. However, there are no federal or regional funds currently programmed through the Arterial Life-Cycle Program (ALCP) funded through Proposition 400. Additional funding sources may be identified through other programs including a possible extension of Proposition 400. The Maricopa County Department of Transportation (MCDOT) FY 2022 TIP does not identify any funding for this segment of El Mirage Road, nor does the City of Peoria Capital Improvement Program (CIP). The study area is primarily within unincorporated Maricopa County; however, as development occurs portions of this area could be annexed into one of the local Cities.

The El Mirage Road: SR 303L to Jomax Road Feasibility Study evaluates alternatives for a continuous extension of El Mirage Road from SR 303L to Jomax Road. The alternatives consider the existing utilities, floodplains, canals, and other features within the project area and minimize impacts to the extent possible. This report summarizes baseline data collected, the existing and future traffic operational analysis, and development and evaluation of alternatives. The future El Mirage Road extension is primarily within unincorporated Maricopa County and, for the purposes of this Feasibility Study, MCDOT standards are used to develop and evaluate the alternatives. The standards to be used for the design concept, final design and construction phases is dependent on which agency has primary jurisdiction of El Mirage Road from SR 303L to Jomax Road.

#### 1.1 Study Area

El Mirage Road is a north-south facility near the Cities of Surprise and Peoria, and within unincorporated Maricopa County. The southern segment of El Mirage Road between Bell Road and Deer Valley Access Road is constructed in an interim condition mostly without curb, gutter, and sidewalk, and includes two lanes in each direction of travel.



Photos (source – Google): Northbound (left) & Southbound (right) El Mirage Road between Bell Road and Deer Valley Access Road

El Mirage Road has three lanes in each direction of travel with outside curb and gutter between Deer Valley Access Road and SR 303L, with right and left turn lanes at various access points along the existing corridor, and six-foot outside shoulders to accommodate bicyclists. This segment of El Mirage Road has an unpaved open median and the ultimate roadway cross section includes sidewalk and curb and gutter along both sides of the roadway for the entire length.



Photos (source – Google): Northbound (left) & Southbound (right) El Mirage Road between Deer Valley Access Road & SR 303L

The project area map (Figure 1-1) includes portions of Peoria and unincorporated Maricopa County. The El Mirage Road Alternatives Corridor (Figure 1-2) is almost exclusively within unincorporated Maricopa County with only a small portion in the City of Peoria near Jomax Road. A TI at SR 303L with a grade-separated structure spans El Mirage Road. The TI is designed to accommodate all future traffic lanes, including auxiliary and turn lanes, on El Mirage Road. El Mirage Road ends just north of the TI but will accommodate a future extension to the north of SR 303L.

El Mirage Road becomes a discontinuous roadway north of SR 303L with various half-street segments from Happy Valley Road to West Desert Sun Lane, and from Jomax Road to Vistancia Boulevard. Happy Valley Road connects to Vistancia Parkway to the east and continues to the west but at the time of this study is not a continuous facility to US 60 (Grand Avenue).



# El Mirage Road

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Figure 1-1: Project Area Map

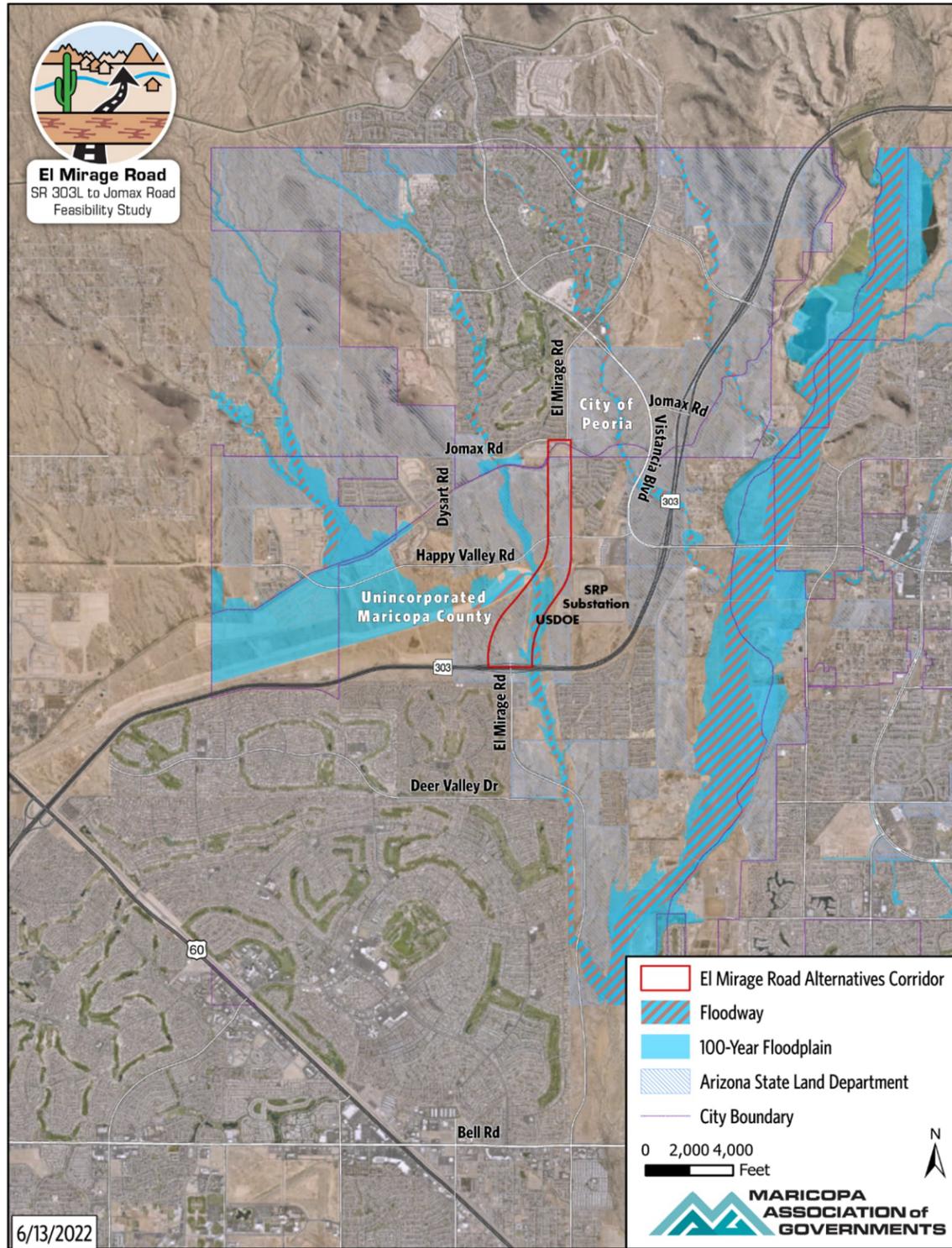
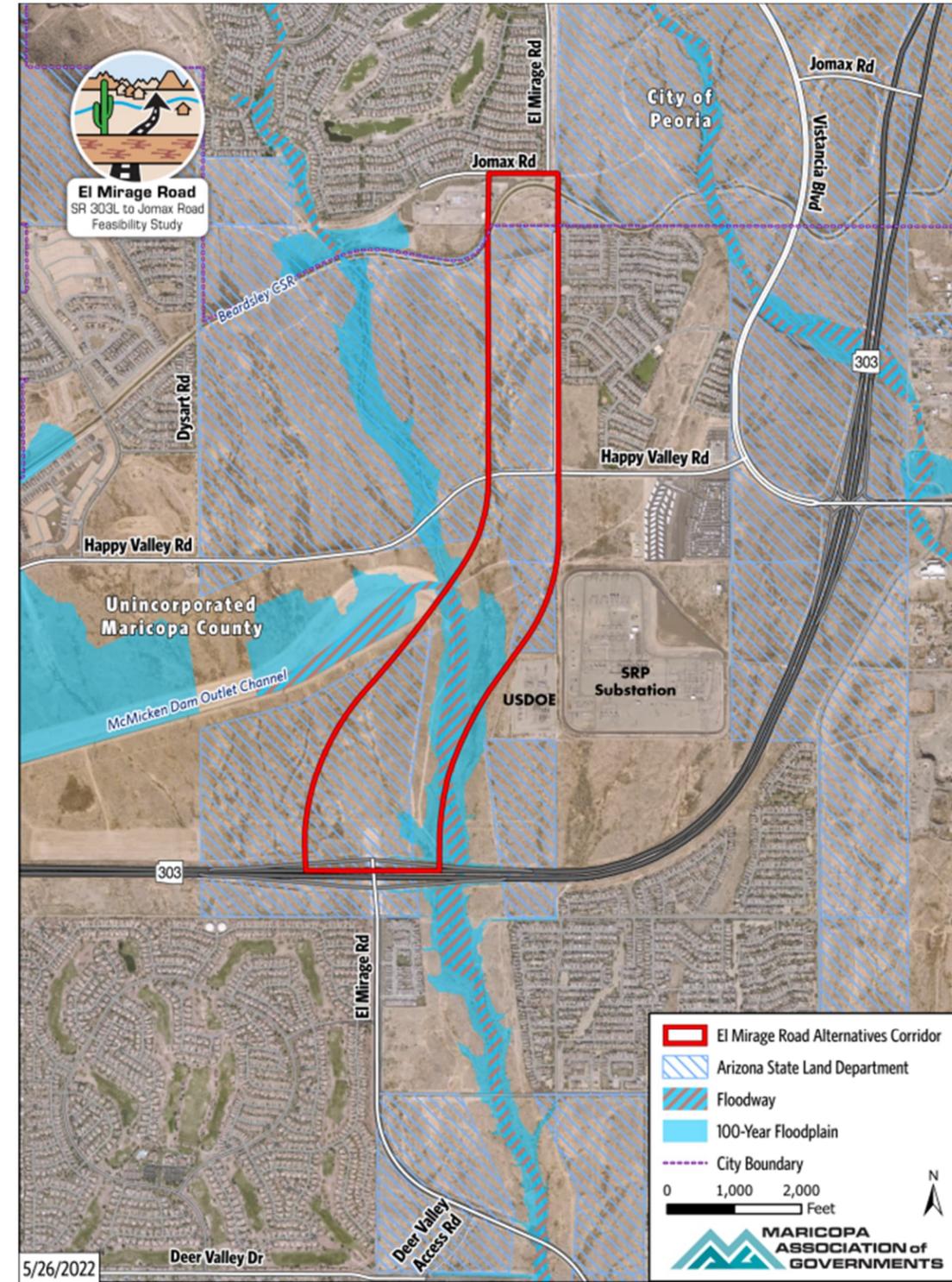


Figure 1-2: Project Study Area





## 2. Existing Conditions

This section describes the efforts needed to assess the existing conditions of the study area. Assessing the existing conditions for operational deficiencies, crash history concerns, and existing utilities helps identify current trends with potential mitigations being incorporated into the future roadway alignment and intersection alternatives.

### 2.1 Data Collection

As part of the feasibility study, Jacobs obtained data from the Maricopa Association of Governments (MAG), the Arizona Department of Transportation (ADOT), the City of Peoria, the Maricopa County Department of Transportation (MCDOT), the Flood Control District of Maricopa County (FCDMC), and other stakeholders. Table 2-1 details relevant information that was collected for the study.

Table 2-1: Data Collected

Data Collected	Purpose of Use
Jomax Design Concept Report	El Mirage Road & Jomax intersection concept layout, future traffic volume estimates
Happy Valley Road & Vistancia Boulevard Feasibility Study	Future traffic volume estimates, future network layouts
Land Use Information	Future traffic volume estimates
Existing and Future development information	Future traffic volume estimates, future network connections
2040 TDM from June and December 2021	MAG 2040 TDM (December 2021) for future traffic volumes
Traffic Counts	Existing turning movement volumes
Traffic Signal Timing Plans	Create existing traffic models
Crash Data	Crash history analysis
Parcel Ownership	Identify owners within the project limits
Existing Utilities	Identify existing utilities (see Section 2.3)

United Civil Group collected turning movement counts in October 2021 during the AM (7-9 a.m.) and PM (4-6 p.m.) peak period hours for the existing conditions traffic analysis. United Civil Group collected turning movement counts at the intersections shown in Figure 2-1. The SR 303L and El Mirage Road TI WB-ramps were not counted but turning movements were derived from the EB-ramp counts which allowed for the intersection to be analyzed operationally. Four other study intersections were not counted, therefore not analyzed operationally. These intersections were looked at as part of the crash analysis only.

### 2.2 Existing Conditions

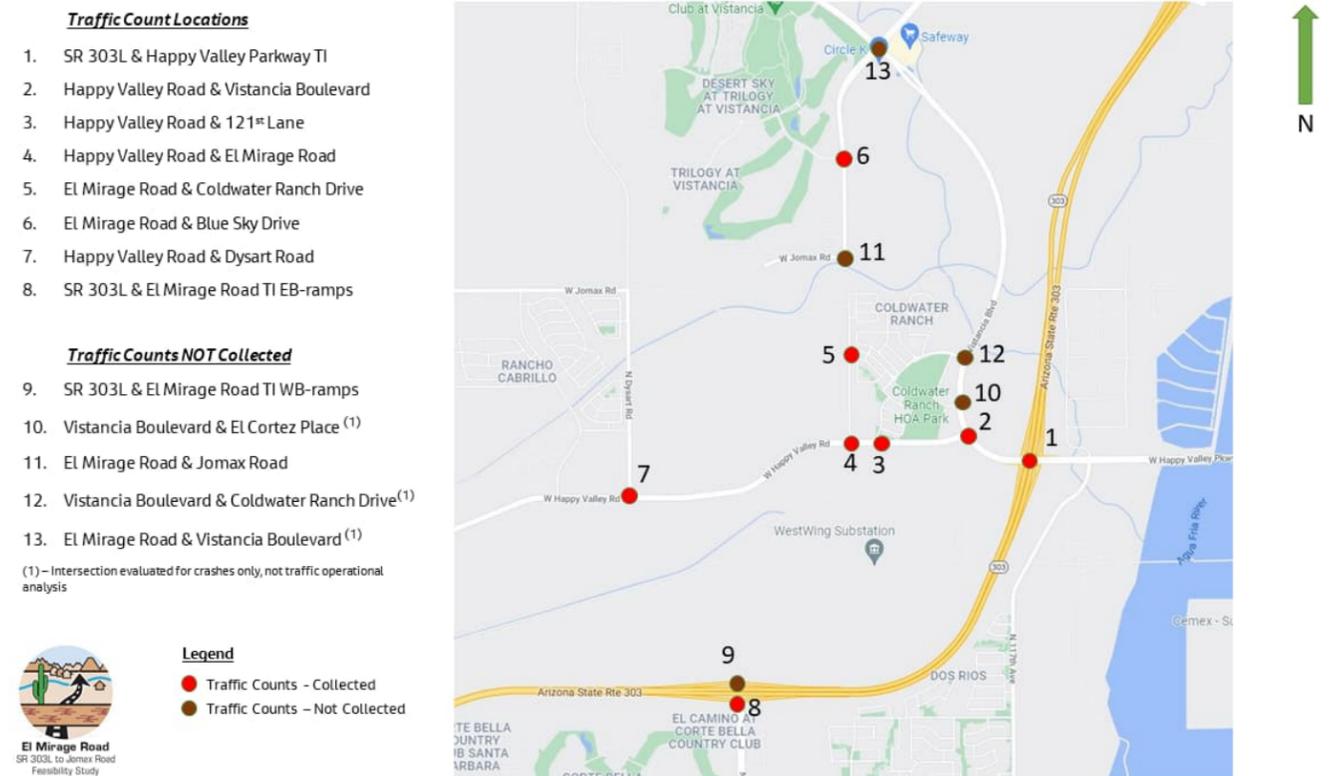
#### 2.2.1 Existing Traffic Model Data

The existing conditions analysis uses the October 2021 turning movement counts. Based on previous discussions with MAG, reductions in peak hour traffic volumes due to COVID-19 had diminished significantly by late 2021. Therefore, no

COVID-related adjustments were made to the count volumes. Figure 2-2 summarizes the turning movement counts. Traffic count data is provided in Appendix A.

AM and PM peak hour traffic models were created using Synchro 11 based on turning movement counts, traffic signal timings, and roadway characteristics, such as speed limit, existing lane geometry, and intersection control type.

Figure 2-1: Study Intersection & Turning Movement Count Locations

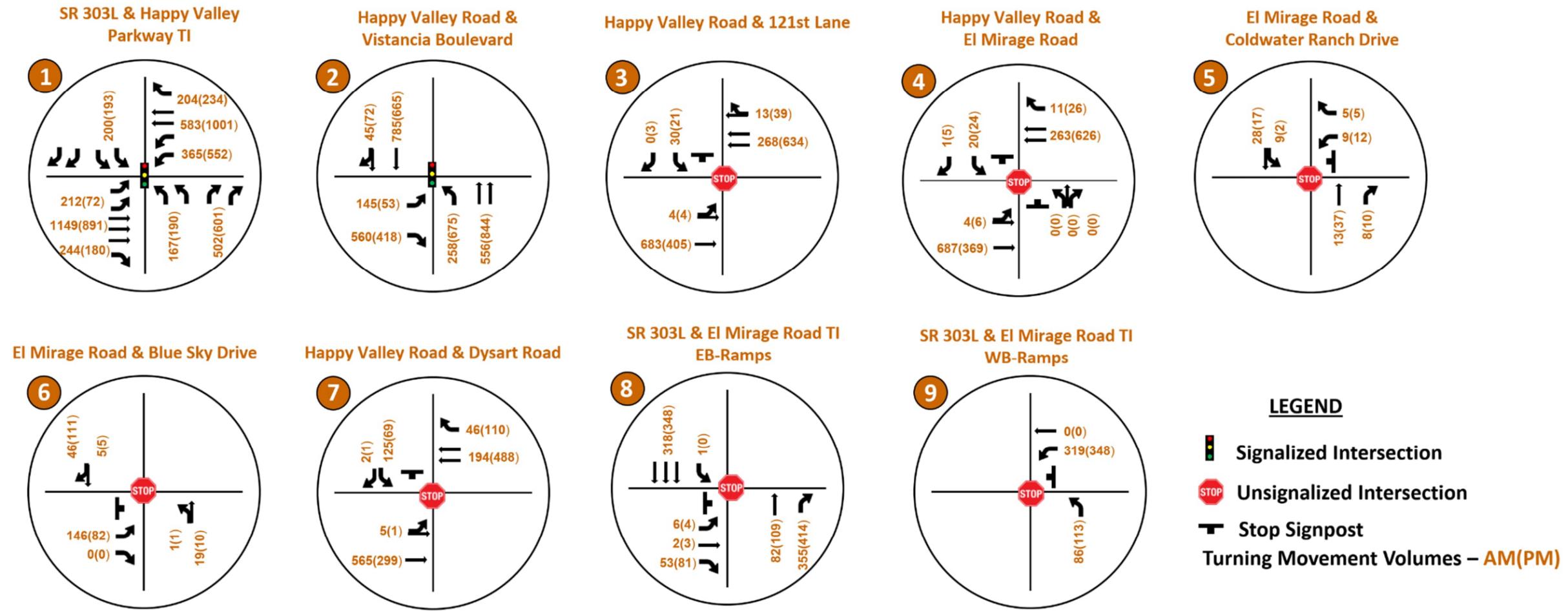




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Figure 2-2: Existing Lane Configurations and AM/PM Peak Hour Turning Movements





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### 2.2.2 Existing Roadway Conditions Operational Analysis

Intersection traffic operations were analyzed pursuant to the nationally accepted methodology in the Transportation Research Board's *Highway Capacity Manual, 6<sup>th</sup> Edition (October, 2016)* (HCM). The Level of Service (LOS) for individual movements, approaches, and intersections was calculated with Synchro 11 using the HCM module. Traffic signal timings provided by stakeholders were used but were not adjusted or optimized.

LOS is a qualitative measure of traffic operations at an intersection or on a roadway segment. It is ranked from LOS A, which signifies little or no congestion, to LOS F, which signifies congestion and traffic jam conditions. At unsignalized intersections, LOS is calculated for movements that must either stop for or yield to oncoming traffic and is based on average control delay for that particular movement. A LOS of D or better is considered acceptable. Control delay is the portion of total delay attributed to traffic control measures such as stop signs or traffic signals. The criteria for LOS at unsignalized and signalized intersections are shown in Table 2-2 and Table 2-3, respectively.

Table 2-2: Level of Service Criteria for Unsignalized Intersections

Level-of-Service	Delay
A	≤ 10 seconds per vehicle
B	> 10 and ≤ 15 seconds per vehicle
C	> 15 and ≤ 25 seconds per vehicle
D	> 25 and ≤ 35 seconds per vehicle
E	> 35 and ≤ 50 seconds per vehicle
F	> 50 seconds per vehicle

Table 2-3: Level of Service Criteria for Signalized Intersections

Level-of-Service	Delay
A	≤ 10 seconds per vehicle
B	> 10 and ≤ 20 seconds per vehicle
C	> 20 and ≤ 35 seconds/vehicle
D	> 35 and ≤ 55 seconds/vehicle
E	> 55 and ≤ 80 seconds/vehicle
F	> 80 seconds per vehicle

The results of the operational analysis for the AM and PM peak hours for the existing condition are shown in Table 2-4 and Table 2-5. Eight of the nine intersections operate at acceptable levels of service, with only the signalized intersection at Happy Valley Road and Vistancia Boulevard experiencing some turning movements at LOS E or F. The City of Peoria is currently evaluating this intersection to determine improvements through a separate study. Detailed capacity calculations are in Appendix B.

Table 2-4: Existing AM Peak Hour LOS & Delay (seconds per vehicle)

#	Intersection	Overall		Eastbound		Westbound		Northbound		Southbound	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	SR 303L SPUI & Happy Valley Pkwy Ramps <sup>(1)</sup>	B	15.3	B	19.3	B	12.1	C	30.1	C	30.9
2	Happy Valley Road & Vistancia Boulevard	D	40.0	F	96.6	-	-	A	6.2	C	25.0
3	Happy Valley Rd & 121st Ln <sup>(2)</sup>	A	0.5	A	9.3	-	-	-	-	B	14.5
4	Happy Valley Rd & El Mirage Rd <sup>(2)</sup>	A	0.3	A	7.9	-	-	-	-	C	15.9
6	El Mirage Rd & Blue Sky Dr <sup>(4)</sup>	A	6.7	A	9.9	-	-	A	7.3	-	-
7	Dysart Rd & Happy Valley Rd <sup>(2)</sup>	A	2.2	A	7.8	-	-	-	-	C	15.5
8	SR 303L & EB El Mirage Rd TI EB-Ramps	A	8.2	A	1.6	-	-	A	9.2	A	8.2
9	SR 303L & WB El Mirage Rd TI WB-Ramps <sup>(4)</sup>	A	8.3	-	-	A	4.9	C	21.4	-	-
12	El Mirage & Coldwater Ranch <sup>(3)</sup>	A	2.6	-	-	A	8.7	-	-	A	7.3

(1) - NB & SB delays reported are for left turns

(3) - SB delays reported are for left turns

(2) - EB delays reported are for left turns

(4) - NB delays reported are for left turns

Table 2-5: Existing PM Peak Hour LOS & Delay (seconds per vehicle)

#	Intersection	Overall		Eastbound		Westbound		Northbound		Southbound	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	SR 303L SPUI & Happy Valley Pkwy Ramps <sup>(1)</sup>	B	15.6	B	18.1	B	17.4	C	30.5	C	30.5
2	Happy Valley Road & Vistancia Boulevard	E	55.5	C	22.5	-	-	F	80.4	C	25.2
3	Happy Valley Rd & 121st Ln (2)	A	0.5	B	11.9	-	-	-	-	C	17.5
4	Happy Valley Rd & El Mirage Rd (2)	A	0.6	A	9.1	-	-	-	-	C	20.3
6	El Mirage Rd & Blue Sky Dr (4)	A	3.8	A	9.6	-	-	A	7.5	-	-
7	Dysart Rd & Happy Valley Rd (2)	A	1.2	A	8.9	-	-	-	-	C	16.9
8	SR 303L & EB El Mirage Rd TI EB-Ramps	A	8.9	A	2	-	-	B	10.4	A	8.4
9	SR 303L & WB El Mirage Rd TI WB-Ramps <sup>(4)</sup>	A	9.5	-	-	A	5.1	C	23.1	A	8.4
12	El Mirage & Coldwater Ranch (3)	A	2	-	-	A	8.8	-	-	A	7.3

(1) - NB & SB delays reported are for left turns

(3) - SB delays reported are for left turns

(2) - EB delays reported are for left turns

(4) - NB delays reported are for left turns

### 2.2.3 Crash Analysis

A crash analysis was prepared for each of the 11 intersections within the study network to identify safety issues, which could aid alternatives development. The crash data covers a five-year period from January 1, 2016, through December 31, 2020, and includes details about crash type, severity, and other factors. A copy of the raw data, as well as summary tables, is in Appendix C. The following subsections summarize the crash data.

#### Crashes by Year

Table 2-6 summarizes the total number of annual crashes at each intersection for the five-year analysis period. Figure 2-3 shows the total crashes by location. As shown, 56 crashes occurred during the five-year analysis period, with a consistent number of annual crashes in 2017, 2019, and 2020. The lowest number of crashes occurred in 2018. Three intersections did not experience any crashes until 2019 which is likely due to the low volumes at the intersections. Based on the summary table, there are no apparent safety issues in the crash data when sorted by year.



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Table 2-6: Crashes by Year

Crashes By Year							
#	Intersection Name	2016	2017	2018	2019	2020	Total Crashes
1	SR 303L & Happy Valley Parkway TI	2	4	1	5	3	15
2	Happy Valley Road & Vistancia Boulevard	2	2	4	2	4	14
3	Happy Valley Road & 121st Lane					1	1
4	Happy Valley Road & El Mirage Road					1	1
7	Happy Valley Road & Dysart Road		1		1		2
8	SR 303L & El Mirage Road TI EB-ramps	2	2				4
9	SR 303L & El Mirage Road TI WB-ramps	3					3
10	Vistancia Boulevard & El Cortez Place	1				1	2
12	Vistancia Boulevard & Coldwater Ranch Drive				3		3
13	El Mirage Road & Vistancia Boulevard		4	2	2	3	11
Total		10	13	7	13	13	56

### Crashes by Type

Table 2-7 summarizes the 56 crashes throughout the study area at each intersection by type. Crash type categories include rear-end, left-turn, angle, sideswipe, single vehicle, head-on, and other crashes, which include unknown and/or any other crash type that does not fall under the aforementioned categories. The most common crash type in the study area is rear-end, followed by left turn. Rear-end crashes are common at signalized intersections due to the introduction of stops to a traffic stream. Left-turn crashes occur between a left-turning vehicle and an opposing through vehicle. Based on the summary table, there are no apparent safety issues in the crash data when sorted by type.

The intersections that experienced the highest number of crashes are:

1. Happy Valley Parkway & SR 303L EB-ramps (15),
2. Happy Valley Road & Vistancia Boulevard (14), and
3. El Mirage Road & Vistancia Boulevard (11).

All three intersection are signalized and experience the highest volumes of daily traffic, which is why they experience the highest number of crashes.

Figure 2-3: Total Crashes by Location (Ranked)

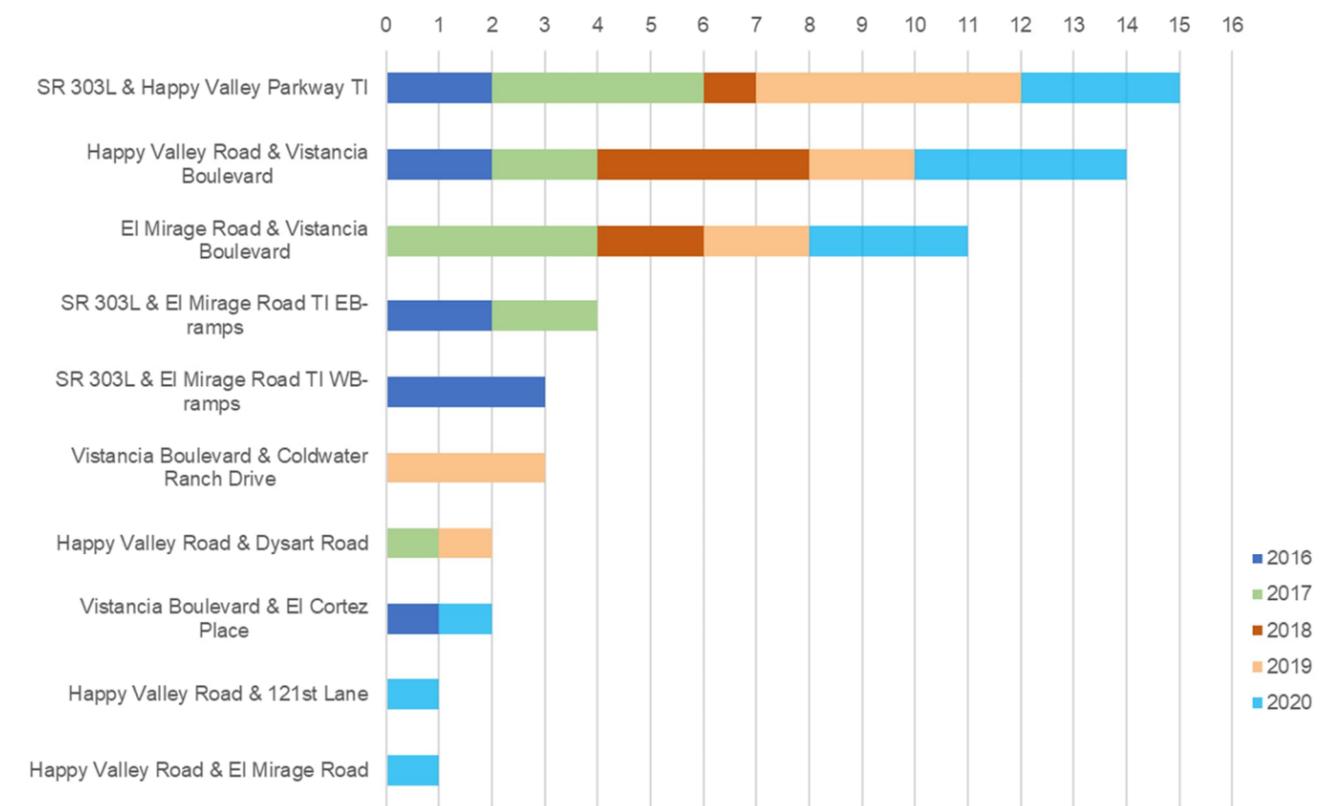


Table 2-7: Crashes by Type

Crashes By Type										
#	Intersection Name	Angle	Left-Turn	Rear-End	Sideswipe	Single Veichle	Head-On	U-Turn	Other	Total Crashes
1	SR 303L & Happy Valley Parkway TI	4	3	5		1		2		15
2	Happy Valley Road & Vistancia Boulevard	1	5	4		4				14
3	Happy Valley Road & 121st Lane		1							1
4	Happy Valley Road & El Mirage Road	1								1
7	Happy Valley Road & Dysart Road	1				1				2
8	SR 303L & El Mirage Road TI EB-ramps			2	2					4
9	SR 303L & El Mirage Road TI WB-ramps			3						3
10	Vistancia Boulevard & El Cortez Place			2						2
12	Vistancia Boulevard & Coldwater Ranch Drive		2			1				3
13	El Mirage Road & Vistancia Boulevard		2	3		4			2	11
Total		7	13	19	2	11	0	2	2	56



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### Crashes by Severity

Figure 2-4 and Table 2-8 summarizes the total number of crashes at each intersection by severity. The reporting officer determines crash severity at the time of the crash, or soon thereafter, based on the most severe injury sustained by the involved parties. Crashes are classified from the most severe (fatal) to least severe (no injury).

Throughout the five-year period, of the 56 crashes, zero (0.0%) fatal crashes occurred; three (5.4%) serious injury crashes occurred; 19 (34.0%) possible/minor injury crashes occurred, and 34 (60.7%) no-injury crashes occurred. Based on the summary table, there are no apparent safety issues in the crash data when sorted by severity.

Figure 2-4: Crash Severity

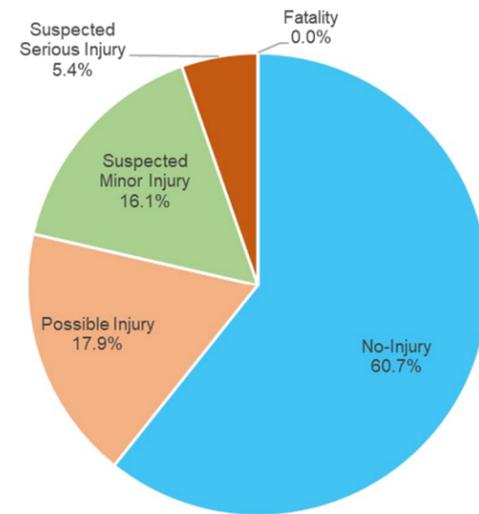


Table 2-8: Crashes by Severity

Crashes By Severity							
#	Intersection Name	No-Injury	Possible Injury	Suspected Minor Injury	Suspected Serious Injury	Fatality	Total Crashes
1	SR 303L & Happy Valley Parkway TI	11	3	1			15
2	Happy Valley Road & Vistancia Boulevard	9	2	2	1		14
3	Happy Valley Road & 121st Lane			1			1
4	Happy Valley Road & El Mirage Road			1			1
7	Happy Valley Road & Dysart Road	1	1				2
8	SR 303L & El Mirage Road TI EB-ramps	2			2		4
9	SR 303L & El Mirage Road TI WB-ramps		1	2			3
10	Vistancia Boulevard & El Cortez Place	1	1				2
12	Vistancia Boulevard & Coldwater Ranch Drive	2	1				3
13	El Mirage Road & Vistancia Boulevard	8	1	2			11
	Total	34	10	9	3	0	56

### 2.3 Utility Coordination

The study team has been coordinating with area utility agencies through MAG to obtain current mapping and plans for future utilities. Several Salt River Project (SRP) power transmission lines cross the alternatives corridor. Most notable are two separate sets of high-voltage cables that run parallel on the south side of the McMicken Dam Outlet Channel and connect to the SRP power substation to the east. These transmission lines reside within 330-foot easements owned by SRP. Additionally, the Western Area Power Administration (WAPA) high-voltage power lines cross the corridor north of SR 303L and connect to a United States Department of Energy (USDOE) power substation to the east of the alternatives corridor. There is a Southwest Gas 36-inch high-pressure gas line that parallels the SRP powerline easement on the south. Table 2-9 summarizes the utility stakeholders in the project vicinity and if relevant information has been received.

Table 2-9: Utility Stakeholders

Organization	Information Received
ADOT-Maricopa	X
Arizona Public Service (APS) Locate Department	X
City of Peoria Utilities	X
City of Surprise	
Cox Communications - Maricopa	
CTLQL - Centurylink	
Epcor Water (USA) Inc. - Sun City	
Maricopa County DOT	X
MCI	X
Verizon	X
Southwest Gas High Pressure NW	X
Transwestern Pipeline Co. - Maricopa County	
Zona Wyerd	X



### 3. Design Concept Alternatives

The goal of the alternatives development process is to develop an El Mirage Road alignment that connects SR 303L to Jomax Road and minimizes the potential effects of El Mirage Road on the natural environment, drainage and floodplain facilities, potential utility impacts and ROW and development opportunities, including maximizing the use of remnant parcels, and traffic operational performance. Various alternatives allow for a comparative analysis of each to determine which alternative provides the best solution for El Mirage Road.

The alternatives development process begins by assessing the forecasted 2040 traffic volumes, stakeholder input, existing corridor features (such as the utility locations, existing roadways, canals, and other items), parcel locations and area development. Alternatives are further developed using applicable MCDOT design guidelines, including the number of travel lanes and typical cross sections, varying alignments are then established to connect El Mirage Road at SR 303L TI to Jomax Road.

The purpose of this process is to assess each alternative based on selected performance measures, leading to a most favorable roadway alignment and intersection layouts. Ultimately, the most favorable alternative will be a balance of the performance measures and is feasible for further study.

#### 3.1 Road Design Guidelines

The study area is primarily within unincorporated Maricopa County and the MCDOT Roadway Design Standards (August 2021) were used to develop the roadway alternatives and the typical cross section for this portion of El Mirage Road. Future phases of development will determine the ultimate jurisdiction of the roadway, which could result in adjustments to the typical roadway section. However, for the purposes of this study the MCDOT standards are used.

The average daily traffic (ADT) volumes were estimated from the MAG 2040 December model, and it was determined that the ultimate typical section of El Mirage Road should be a six-lane principal arterial based on the *MCDOT Roadway Design Manual - Table 2.1 Roadway Planning Level Traffic Volumes* (Table 3-1). Table 2.1 of the MCDOT Roadway Design Manual provides general traffic volumes to achieve the desired LOS for various roadway classifications. The ultimate number of lanes planned for the corridor aligns with the City of Peoria 2040 General Plan (December, 2020).

Figure 3-1 summarizes the 2040 forecasted ADT and MCDOT ADT thresholds for Principal Arterial roadway types. The thresholds prescribe the correct roadway cross section that allows for an acceptable volume to capacity ratio. Based on the MCDOT ADT thresholds, the initial typical section would meet the volume-to-capacity as a four-lane principal arterial. Therefore, the initial roadway is assumed to be a four-lane arterial with the ultimate typical section being a six-lane urban principal arterial and have a posted speed limit of 45 miles per hour. The MCDOT standard typical section for a six-lane arterial is shown in Figure 3-2 and Figure 3-3 shows the initial four-lane typical section that is compatible with the ultimate six-lane typical section. The ROW required for a six-lane arterial is 130 feet and includes a center median, bicycle lanes, and detached sidewalk. Design criteria such as minimum curve radius and tangents between curves were used in the concept roadway design but will need to be confirmed during later stages of corridor development. Vertical design elements were not considered for this study. All roadway alignments in this section meet at the existing El Mirage Road and Happy Valley Road intersection and at the SR 303L and El Mirage Road TI.

Although the MCDOT typical section standard is being used for the purposes of the alternatives development and evaluation process, it should be noted that during future phases of corridor development this could ultimately reside under the City of Peoria jurisdiction. The City's preferred typical section is shown in Figure 3-4.

Figure 3-1: 2040 Average Daily Traffic Volumes

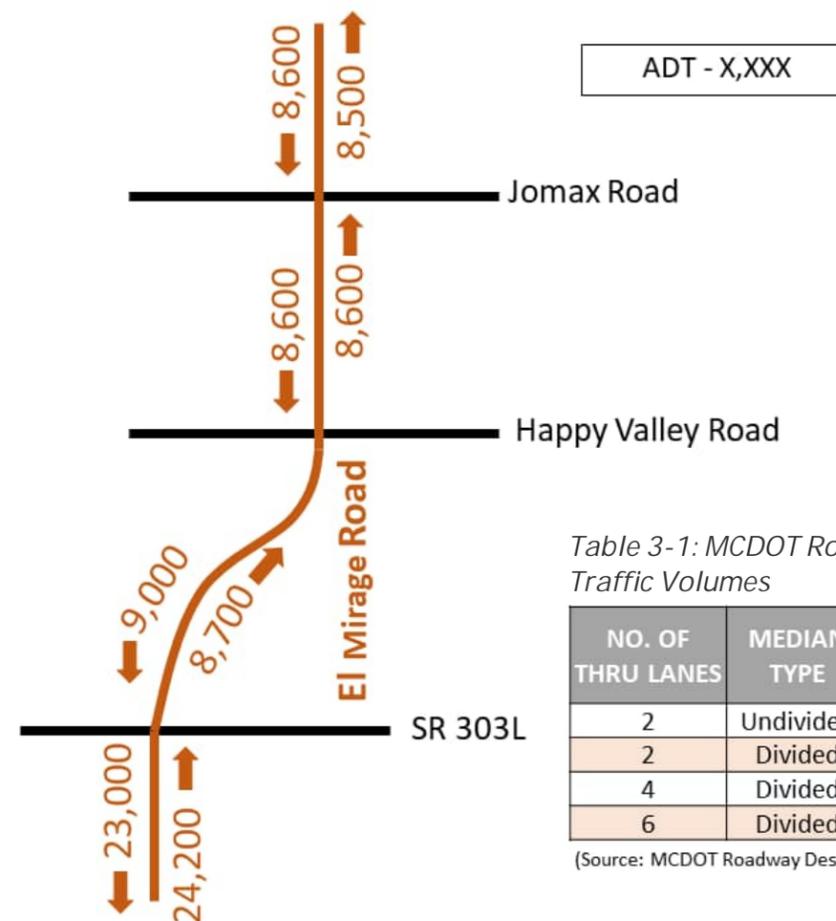


Table 3-1: MCDOT Roadway Planning Traffic Volumes

NO. OF THRU LANES	MEDIAN TYPE	MAXIMUM ADT
2	Undivided	15,000
2	Divided	15,900
4	Divided	34,100
6	Divided	51,500

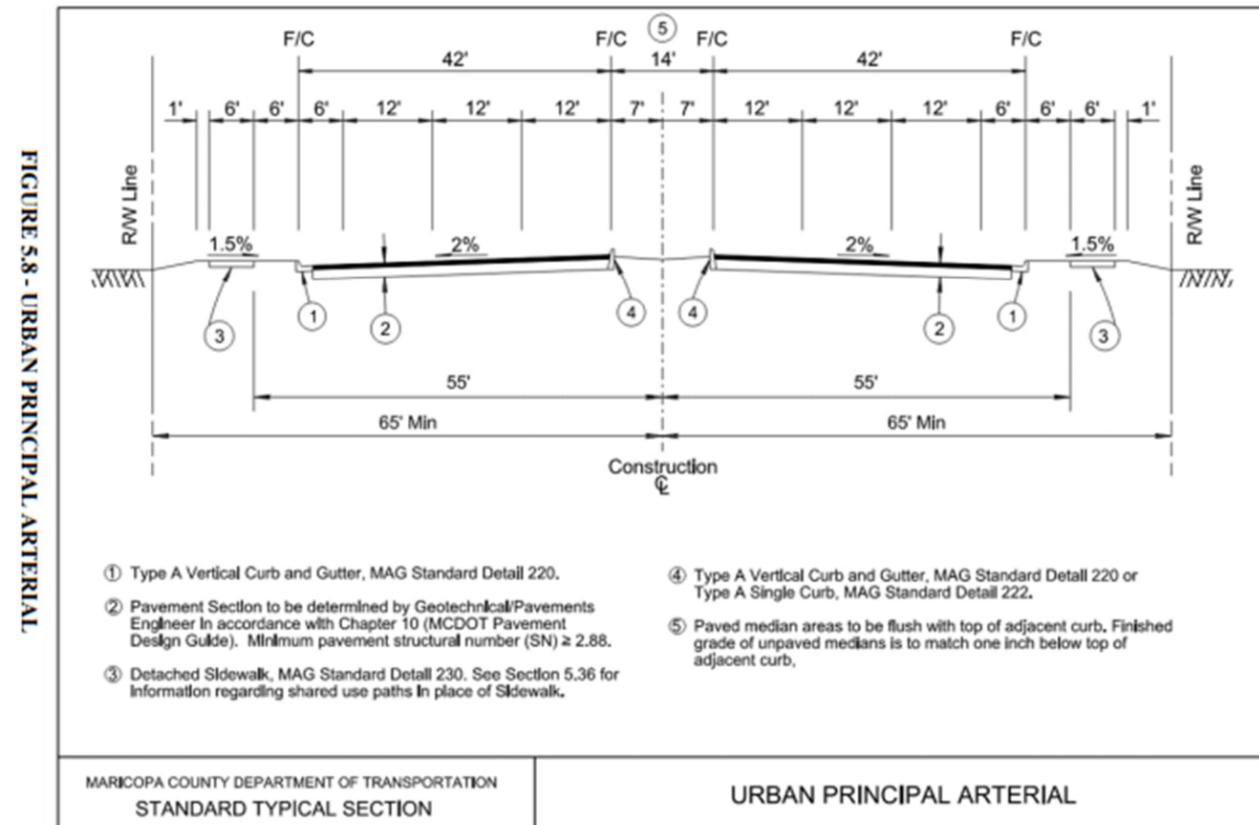
(Source: MCDOT Roadway Design Standards, Table 2.1)



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Figure 3-2: MCDOT Urban Principal Arterial Typical Section



(Source: MCDOT Roadway Design Standards)

Figure 3-3: Initial Typical Section

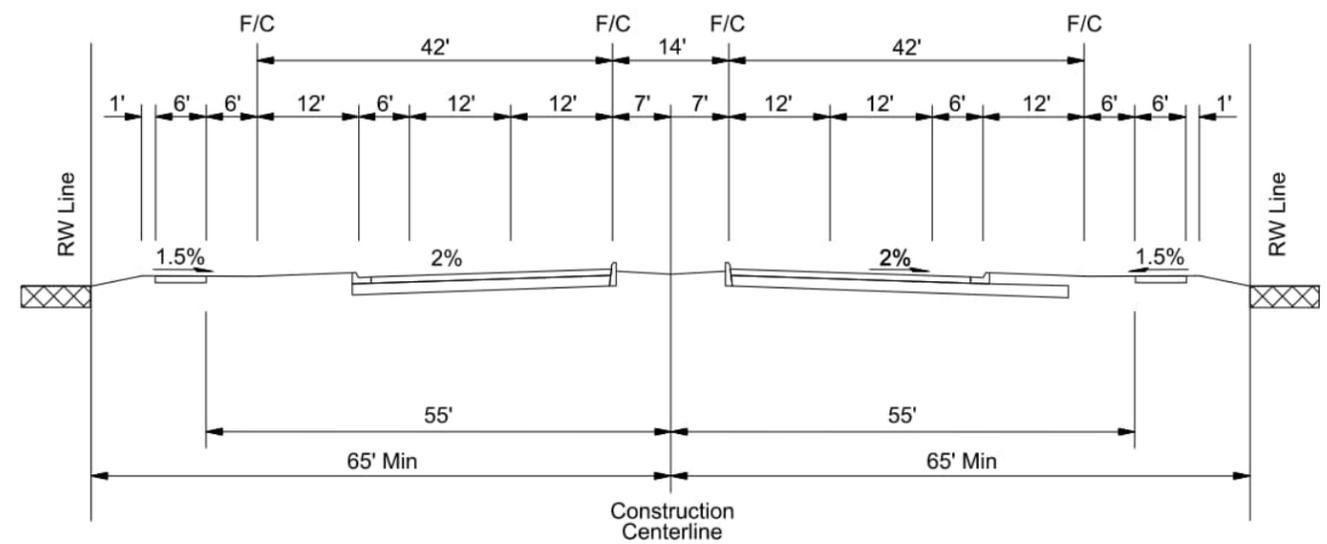
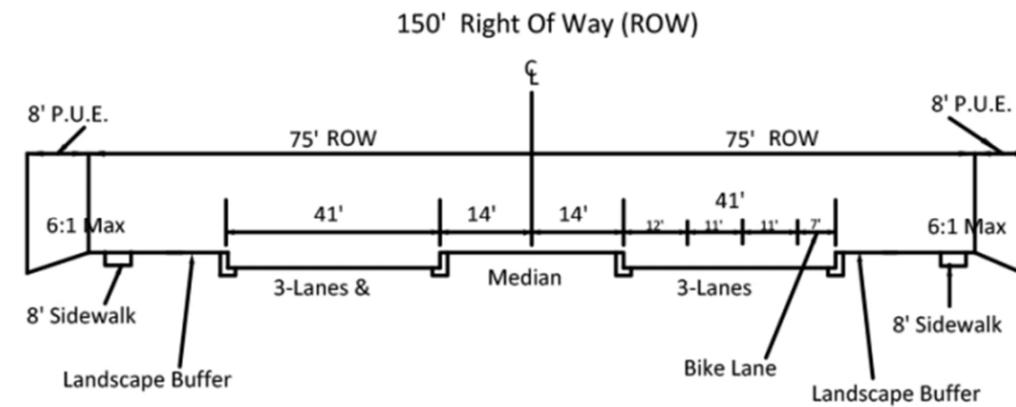


Figure 3-4: City of Peoria Parkway Typical Section



(Source: City of Peoria Engineering Standards, Figure 5-1, January 2021)

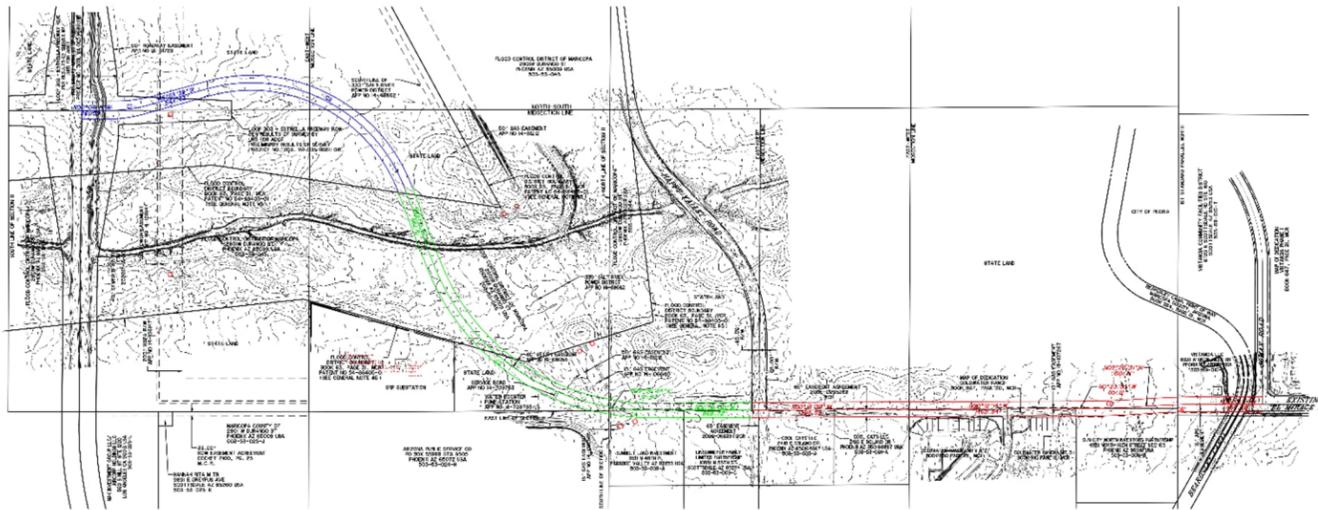


## El Mirage Road

SR 303L to Jomax Road Feasibility Study

The SR 303L TI provides a connection point to accommodate El Mirage Road north of the TI. El Mirage Road is skewed through the TI toward the northwest to avoid conflict with the existing APS transmission line tower north of SR 303L. As shown in Figure 3-5, a conceptual alignment prepared by Goodwin and Marshall for the Vistancia developer was developed in April 2008 and was used as a baseline for the project team to consider during alternatives development, but it did not include a skewed alignment at the SR 303L TI. This drawing provided roadway alignment data, design criteria, and alignment constraints in 2008, including existing ROW, utility easements, and other facilities (e.g., pump station) in place at that time.

Figure 3-5: 2008 Conceptually Approved Alignment for El Mirage Road (prepared by Goodwin and Marshall)



The figure shows the initial conceptual alignment in three colors. The blue and green colors represent the alignment in the south section of El Mirage Road between SR 303L and Happy Valley Road. In this section, the extension of El Mirage Road runs in a curvilinear alignment that begins at the existing SR 303L interchange and connects with Happy Valley Road at the intersection of Happy Valley Road and an existing short portion of El Mirage Road that continues to the north. The red color represents the alignment in the north section of El Mirage Road between Happy Valley Road and Jomax Road. A half-section of El Mirage Road currently exists for a portion of this section. The north section alignment is nearly straight.

### 3.2 El Mirage Road: SR 303L to Happy Valley Road Alignment Alternatives

Three alignment alternatives were developed for El Mirage Road from SR 303L to Happy Valley Road as shown in Figure 3-6, Figure 3-7, and Figure 3-8 based on constraints from existing geography and infrastructure, such as power lines, floodplains, utilities, and section lines. MAG considered elements such as potential future roadways, future trail crossings (e.g., McMicken, Beardsley Canal, Happy Valley), and access roads/driveways, and stakeholder comments during the alternatives development process.

Each alternative shows a potential connection approximately 1,000 feet north of the El Mirage Road and SR 303L TI northernmost ramps. This connection would provide access in all directions to El Mirage Road to/from a planned development south of the power substations. This access point needs to be further coordinated with ADOT to ensure

that it follows the current ADOT access control guidelines, which requires a full access connection to El Mirage Road be a minimum of 1,320 feet from the TI ramp returns.

#### 3.2.1 Alternative 1

Alternative 1 generally follows an alignment that was developed in 2008 and provided to the study team by the Arizona State Land Department (ASLD) and has been used by area developers to establish potential roadway connections to El Mirage Road. The alignment has been adjusted to match the skewed El Mirage Road alignment at the SR 303L TI with a slight curve since the 2008 design was based on a north-south alignment of the south leg. Each alternative includes a planned access road connection south of the power substations for development in the area. The roadway crossing design is as close to perpendicular as possible to minimize floodplain impacts and provide adequate sight distance. However, this would leave a small remnant parcel between the existing transmission line and El Mirage Road that could limit future uses of the parcel.

Alternative 1 crosses the middle of the floodway. Due to the location and the curve radii used in the alignment, the approaches to both future access roads provide better sight distance and clarity for the driver. Also, the crossing of the floodway was placed away from the existing transmission lines to allow future development between the roadway and the transmission lines.

The following summarizes the key components of Alternative 1 and a concept layout is shown in Figure 3-6:

- Pros:
  - Intersection approaches have minimal curvature or are on a tangent
  - Southern future access road is on a tangent section
  - Allows for additional future access to adjacent properties
- Cons:
  - Potential remnant parcels between roadway and existing energy substations
  - Northern future access road is on a curve
  - Crosses the floodplain at a wider location

#### 3.2.2 Alternative 2

Alternative 2 would shift the floodway crossing further north. This alternative would follow the power line corridor and includes larger radius curves but could result in some smaller strips of remnant parcels. There is one large power pole that Alternative 2 would impact and that would need to be relocated. Additionally, the alignment includes a tight curve near the Happy Valley Road intersection where Alternative 2 would impact more ASLD property than private property.

Alternative 2 utilizes larger radii to place the proposed roadway as close as possible to the existing transmission line easement. This allows for a larger area for development between the proposed roadway and existing energy substations. Moving the floodway crossing north conflicts with the existing transmission towers as the road curves to connect with El Mirage Road north of Happy Valley Road.



## El Mirage Road

SR 303L to Jomax Road Feasibility Study

The following summarizes the key components of Alternative 2 and a concept layout is shown in **Figure 3-7**:

- Pros:
  - Larger radius curves provide better sight distance
  - Least impact to floodplain
  - Southern future access road is on a tangent
  - Minimal remnant parcels
  - Allows for additional future access to adjacent properties
- Cons:
  - Roadway and traffic are closer to the SRP transmission powerline easement
  - Requires more SRP easement area than other alternatives
  - Impacts existing transmission line tower
  - Northern future access road is on a curve
  - Short tangent between the second curve (C2) and the Happy Valley Road intersection
  - Crosses the McMicken Outlet Channel at a point where it is deeper and wider than other alternatives
  - The roadway is very close to the underground Southwest Gas high-pressure gas line

### 3.2.3 Alternative 3

Alternative 3 would shift the floodway crossing further south and crosses the floodway at its narrowest point by using the minimum curve radius on the curve (C1) north of the SR 303L TI. North of the floodway crossing, the proposed roadway follows the existing parcel lines to increase the amount of developable land adjacent to the proposed roadway. However, this increases the length of roadway within the 100-year floodplain.

The following summarizes the key components of Alternative 3 and a concept layout is shown in Figure 3-8:

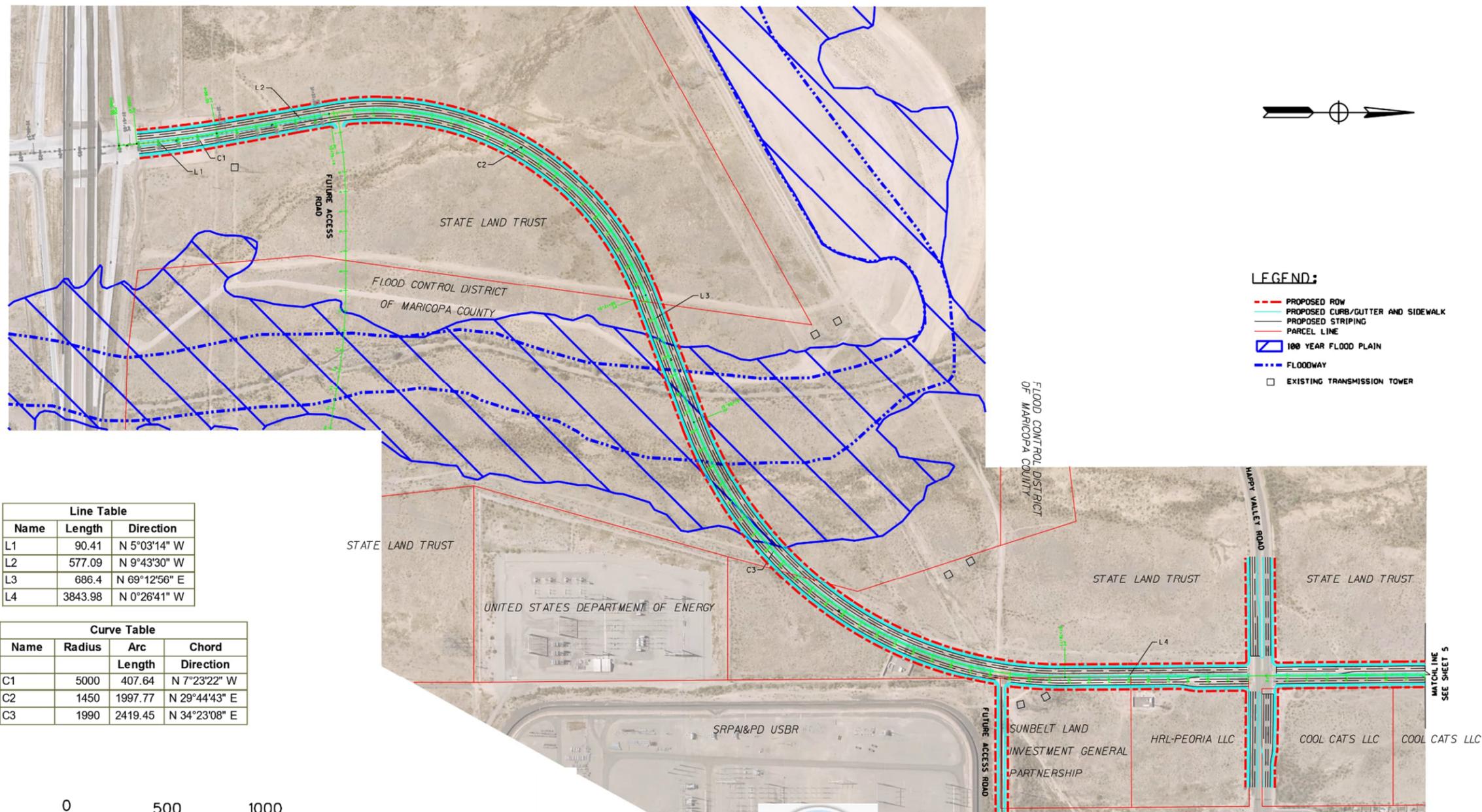
- Pros:
  - Crosses floodway at narrowest point
  - Shortest alignment
  - Possible lower impact to the floodplain than other alternatives
- Cons:
  - Minimum radii used
  - Southern future access road is on a curve
  - Short tangent sections to the approaches at the intersections with SR 303L and Happy Valley Road
  - Potential remnant parcels east of proposed roadway
  - Access to developable land west of roadway would be difficult to place between curve and floodplain



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

Figure 3-6: SR 303L to Happy Valley Road Alternative 1

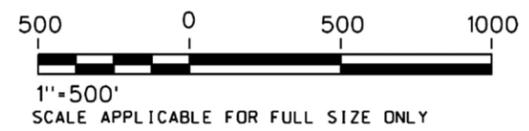


**LEGEND:**

- PROPOSED ROW
- PROPOSED CURB/GUTTER AND SIDEWALK
- PROPOSED STRIPING
- PARCEL LINE
- 100 YEAR FLOOD PLAIN
- FLOODWAY
- EXISTING TRANSMISSION TOWER

Line Table		
Name	Length	Direction
L1	90.41	N 5°03'14" W
L2	577.09	N 9°43'30" W
L3	686.4	N 69°12'56" E
L4	3843.98	N 0°26'41" W

Curve Table			
Name	Radius	Chord	
		Length	Direction
C1	5000	407.64	N 7°23'22" W
C2	1450	1997.77	N 29°44'43" E
C3	1990	2419.45	N 34°23'08" E



**- PRELIMINARY -  
Not For Construction**



EL MIRAGE ROAD  
ALIGNMENT ALT #1  
SHEET 2/7

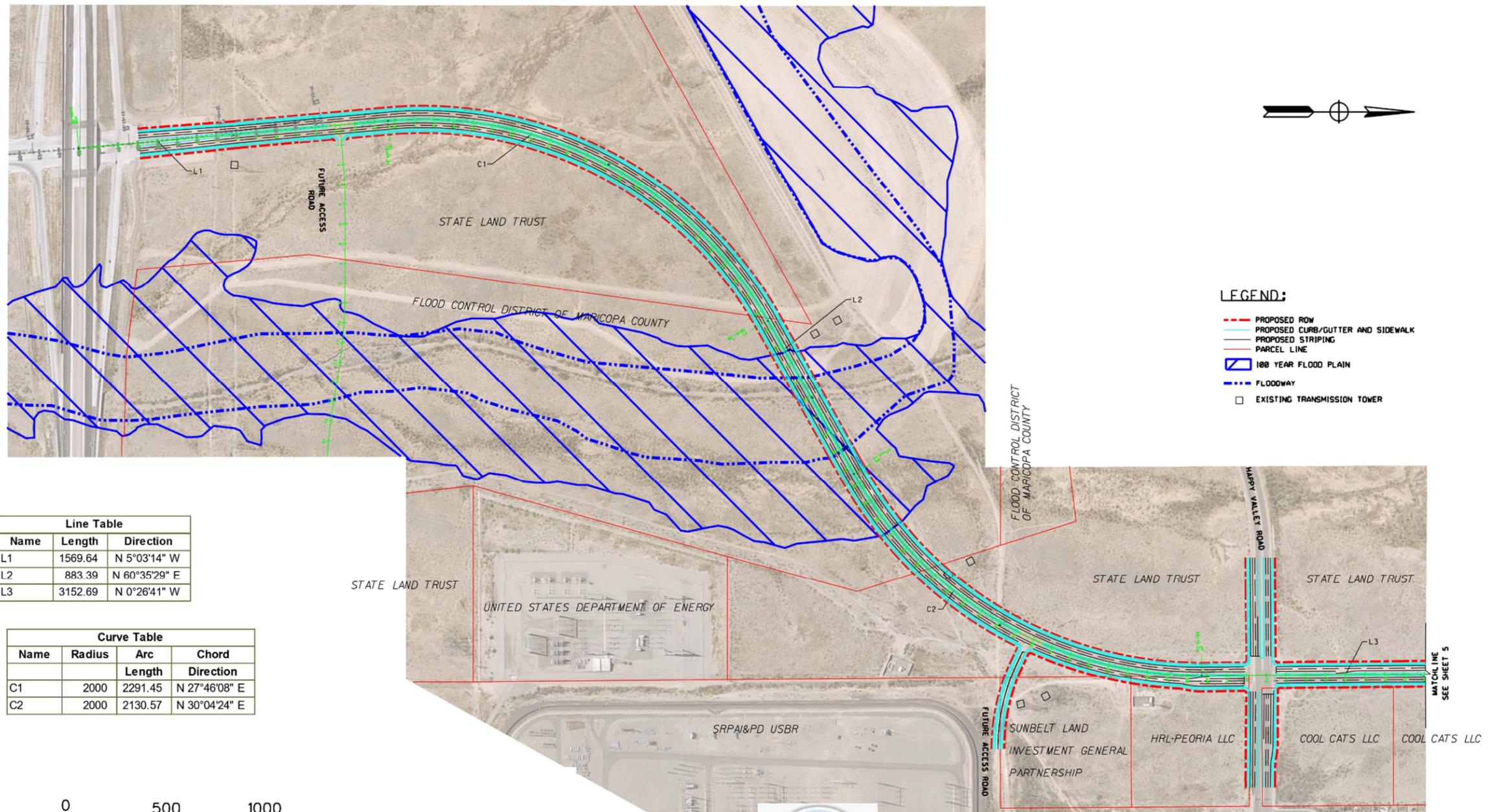




# El Mirage Road

SR 303L to Jomax Road Feasibility Study

Figure 3-7: SR 303L to Happy Valley Road Alternative 2

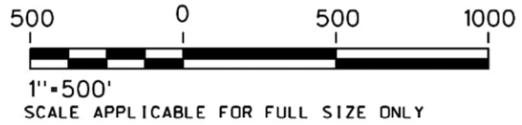


**LEGEND:**

- PROPOSED ROW
- PROPOSED CURB/GUTTER AND SIDEWALK
- PROPOSED STRIPING
- PARCEL LINE
- 100 YEAR FLOOD PLAIN
- FLOODWAY
- EXISTING TRANSMISSION TOWER

Line Table		
Name	Length	Direction
L1	1569.64	N 5°03'14" W
L2	883.39	N 60°35'29" E
L3	3152.69	N 0°26'41" W

Curve Table			
Name	Radius	Arc	Chord
		Length	Direction
C1	2000	2291.45	N 27°46'08" E
C2	2000	2130.57	N 30°04'24" E



**- PRELIMINARY -  
Not For Construction**



EL MIRAGE ROAD  
ALIGNMENT ALT #2

SHEET 3/7

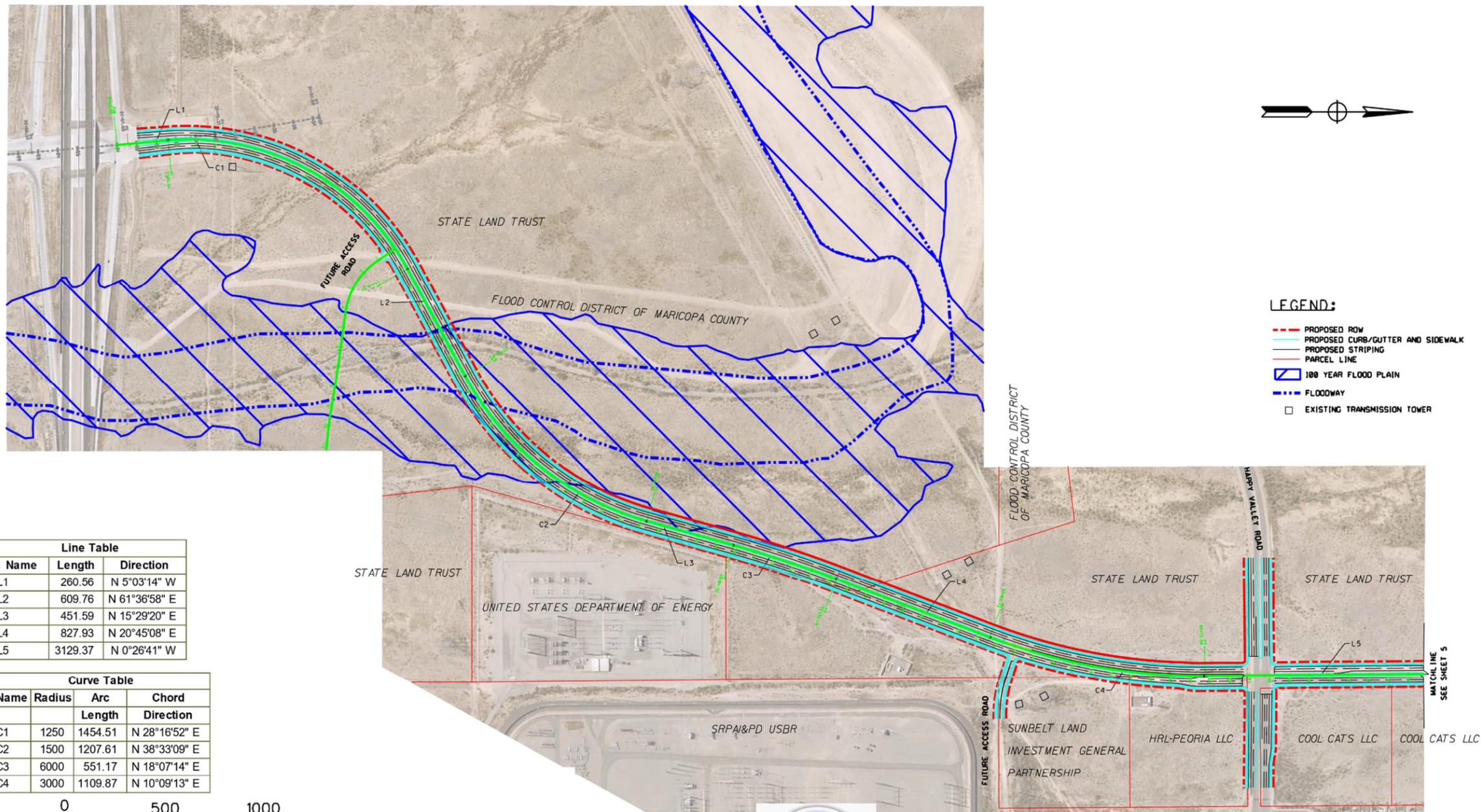




# El Mirage Road

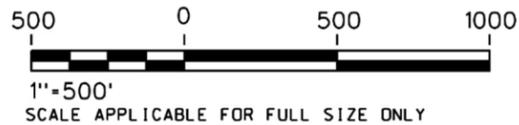
SR 303L to Jomax Road Feasibility Study

Figure 3-8: SR 303L to Happy Valley Road Alternative 3



Line Table		
Name	Length	Direction
L1	260.56	N 5°03'14" W
L2	609.76	N 61°36'58" E
L3	451.59	N 15°29'20" E
L4	827.93	N 20°45'08" E
L5	3129.37	N 0°26'41" W

Curve Table			
Name	Radius	Arc Length	Chord Direction
C1	1250	1454.51	N 28°16'52" E
C2	1500	1207.61	N 38°33'09" E
C3	6000	551.17	N 18°07'14" E
C4	3000	1109.87	N 10°09'13" E



**- PRELIMINARY -  
Not For Construction**



EL MIRAGE ROAD  
ALIGNMENT ALT #3

SHEET 4/7





### 3.3 El Mirage Road: Happy Valley Road to Jomax Road Alignment Alternatives

One alignment alternative has been developed for the El Mirage Road northern segment between Happy Valley Road to El Mirage Road. This alignment would tie into existing ROW and follow the existing half-street roadway. To the extent possible, this alternative has been developed to maximize the use of the existing right-of-way and roadway infrastructure. It will connect centerline-to-centerline to the existing intersection of Jomax Road and the three-lane half-street roadway to the north to ensure the development on the north side is not negatively impacted.

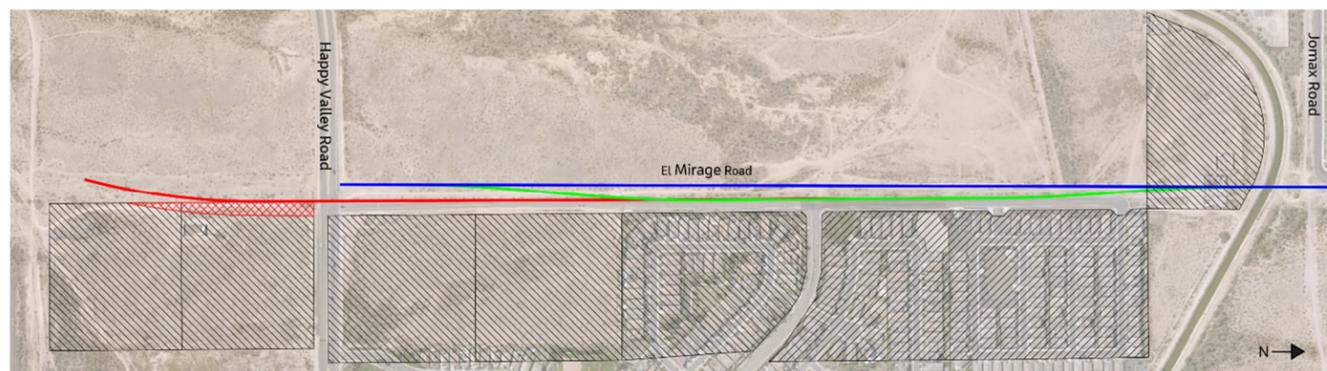
El Mirage Road north of Happy Valley Road currently exists as a two-lane half-street roadway that predominantly serves the neighborhood to the east. This section includes a bike lane in the northbound direction and detached sidewalk on the east side of the road; however, both of those are only present on the east side of the roadway adjacent to the neighborhood. There is a maintenance access road where El Mirage Road ends at Desert Sun Lane. The parcels on the west side of El Mirage Road are currently vacant, there is a break in El Mirage Road between Desert Sun Lane, and Jomax Road and is not continuous over the Beardsley Canal.

The existing segment of El Mirage Rd between Jomax Road and to the north of Blue Sky Drive is a three-lane roadway with a two-way left turn lane (TWLTL), bike lanes in both directions, and detached sidewalk on the west side of the road. The bike lanes end at Jomax Road. This segment will ultimately provide three lanes in each direction of travel, bicycle lanes in both directions, a raised median, offset sidewalks and public utility easements. There are maintenance access points where El Mirage Road ends at Jomax Road.

The ADT volumes were estimated from the MAG 2040 model, and it was determined that the ultimate typical section of El Mirage Road should be a six-lane principal arterial based on the *MCDOT Roadway Design Manual (Table 2.1 Roadway Planning Level Traffic Volumes)*. The interim typical section should be a four-lane principal arterial.

Three variations of the alignment were considered as shown in Figure 3-9. Variation 1 (red) used the existing western edge of El Mirage Road between Happy Valley Road and Desert Sun Lane as the centerline for the future alignment. The intent is to utilize existing infrastructure in the widening of El Mirage Road. Aligning this alternative with any of the alternatives developed in the south section of El Mirage Road would encroach on private parcels in the southeast quadrant (red hatch) of the Happy Valley Road and El Mirage Road intersection based on the assumed typical section.

Figure 3-9: Happy Valley Road to Jomax Road Alternatives



Variation 2 (blue) was developed to eliminate the encroachment of the above-mentioned private parcels, while aligning with the existing eastern edge of El Mirage Road north of Jomax Road. This variation would be a more-or-less straight

roadway from Happy Valley Road to Jomax Road. Variation 2's alignment would mostly require State Land and as a result, the south section of El Mirage Road would be constructed in mostly State Lane south of Happy Valley Road. Variation 3 (green) is a hybrid of Variations 1 and 2. The intersection of Happy Valley Road and El Mirage Road would not encroach on private parcels in the southeast quadrant and then outside of the intersection, El Mirage Road would shift to the east to utilize existing infrastructure, similar to Variation 1. Prior to Desert Sun Lane, El Mirage Road would shift to the west to align with the section of El Mirage Road north of Jomax Road. This shift would be complete prior to the Beardsley Canal.

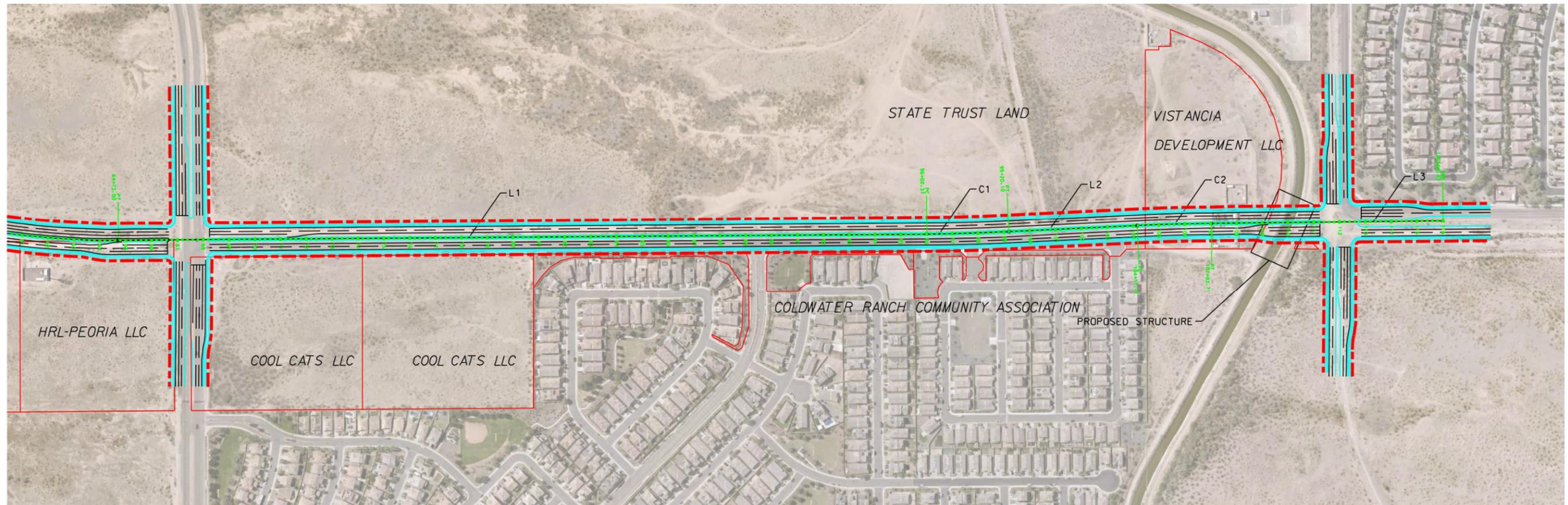
During the Baseline Conditions phase of the Feasibility Study, it was determined that the portion of El Mirage Road between Happy Valley Road and Desert Sun Lane (or just south of) should follow Variation 1 (red) such that roadway ROW would be shared equally between State Land, the private parcels south of Happy Valley Road (red hatch), and existing public ROW and maximize the use of the existing roadways. The portion of Variation 3 (green) that shifts El Mirage Road to the west to align with the section of El Mirage Road north of Jomax Road would also be followed. A concept-level drawing based on this discussion is shown in Figure 3-10 and is included in the Appendix.



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

Figure 3-10: Happy Valley Road to Jomax Road Alternative





### 3.4 Screening Criteria and Performance Measures

Screening criteria were developed to comparatively evaluate alternatives to identify a feasible Build Alternative. The criteria were developed based on input from agency partners and stakeholders to comparatively evaluate build alternatives for effectiveness in determining the feasibility of the project. These criteria were organized into nine performance measure categories: drainage and floodplain impacts, traffic operational performance, multimodal opportunities, ROW impacts, agency acceptance, environmental considerations/sustainability, compatibility with area

development, potential utility impacts, and roadway geometrics. Sixteen performance measures were identified to determine to what extent each alignment alternative meets each criterion and ten were identified for the intersection options. The screening criteria and performance measures are outlined in Table 3-2. The performance measures will be used to compare the alternatives in Chapter 5. Qualitative and quantitative metrics will be used to compare the alternatives.

Table 3-2: Alternative Screening Criteria and Performance Measures

Category	Criteria	Performance Measure	Scale		
			● High Performing	○ Moderate Performing	○ Low Performing
Drainage and Floodplain Impacts	Area of impact to existing floodplains	Permitting processing time and potential ROW costs	Lowest impact to floodplain	Moderate impact to floodplain	Highest impact to floodplain
	Impacts to existing drainage facilities	Capital cost to remove existing structures	Lowest impact to existing drainage elements	Moderate impact to existing drainage elements	Highest impact to existing drainage elements
	Long-term maintenance impacts	Long-term maintenance cost/effort	Lowest long-term maintenance cost/effort	Moderate long-term maintenance cost/effort	Highest long-term maintenance cost/effort
Traffic Operational Performance	Intersection operations	Level of Service	LOS A or B	LOS C or D	LOS E or F
	Individual movement operations	Level of Service	Over 70% of movements at LOS B or better	Over 70% of movements at LOS D or LOS C	Movements with LOS E or F
Multimodal Opportunities	Pedestrian accommodations	Connectivity to trail system	Trail connection from El Mirage	Trail connection from El Mirage side street	No trail connection
		Number of conflict points	Few conflict points	Moderate conflict points	Most conflict points
	Bicycle accommodations	Locations of bike lanes	Highest level of bicycle access	Moderate level of bicycle access	Lowest level of bicycle access
		Ability to provide connectivity to trail systems	Direct trail connection from El Mirage	Trail connection from El Mirage side street	No trail connection
ROW Impacts	Area of impact	Area of ROW required	Fewest acres of ROW	Moderate acres of ROW	Highest acres of ROW
	Remnant parcels	Area of remaining remnant parcels	Fewest acres of remnant parcels	Moderate acres of remnant parcels	Highest acres of remnant parcels
	Private parcels impacted	Number of private parcels impacted	Fewest parcels impacted	Moderate parcels impacted	Highest parcels impacted
Agency Acceptance	Local agency acceptance	Ability to gain local agency support	Highest potential for support	Moderate potential for support	Lowest potential for support
Environmental Considerations/Sustainability	Potential impact to environmental resources	ROW, floodplains, and permitting requirements	Lowest potential for impacts to environmental resources	Moderate potential for impacts to environmental resources	Highest potential for impacts to environmental resources
Compatibility with Area development	Provides for future access to El Mirage Road	Potential locations that could provide future access	Highest length providing possible access	Moderate length providing possible access	Lowest length providing possible access
Potential Utility Impacts	Utilities to be relocated	Number of relocated utilities	0-2	3-5	More than 5
Roadway Geometrics	Roadway design meet standards	Compared to minimum requirements	Highest compatibility with local design standards	Moderate compatibility with local design standards	Lowest compatibility with local design standards



## 4. 2040 Traffic Operations Analysis

Numerous alignment alternatives are being evaluated for the segment from SR 303L to Jomax Road. For the continuous alignment, the volume to capacity ratio of the roadway provides for an acceptable level of service. (See Section 3.1). Therefore, this section focuses on capacity analysis at each intersection.

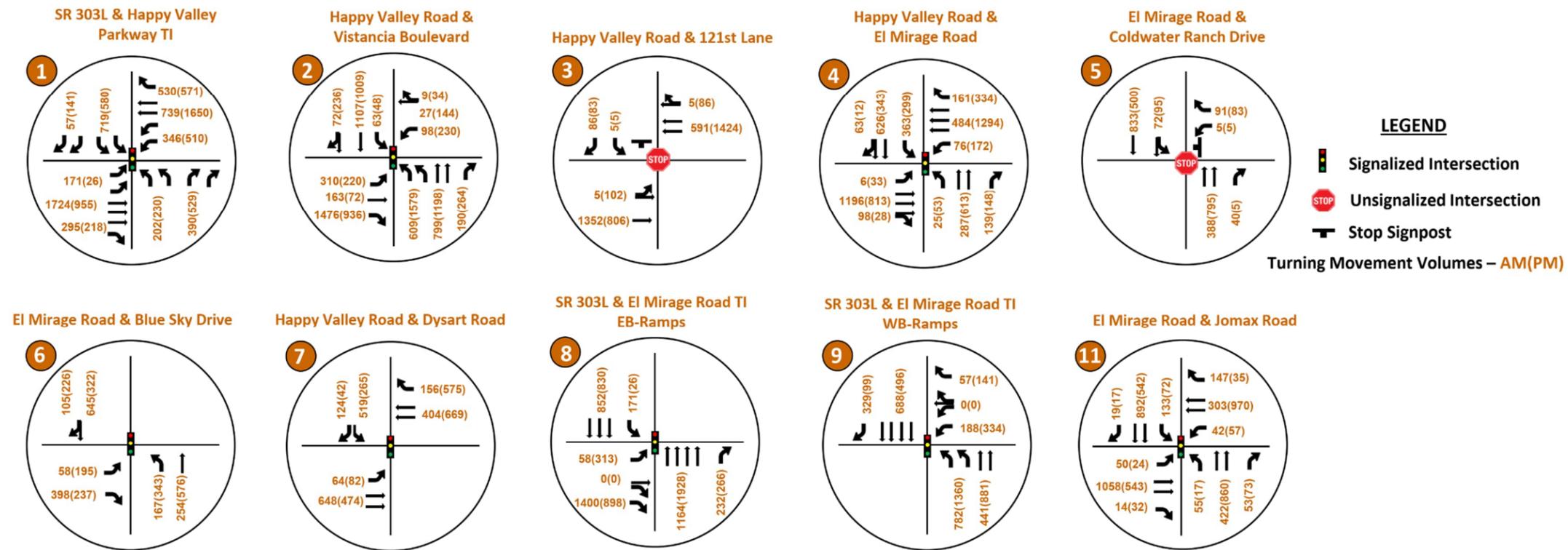
### 4.1 2040 Traffic Volume Forecasts

The 2040 traffic forecasts from the June 2021 and December 2021 MAG traffic models were analyzed. The 2040 model is influenced by growth in population and employment, along with presumed future roadways and connections. The 2040 model shows the extension of El Mirage Road along with the Litchfield Road TI located approximately one mile to the west of El Mirage Road with connectivity to Happy Valley Road. The model also assumes that substantial new development will occur in the land surrounding El Mirage Road has been built out. These models show daily (24-hour) and peak period volumes by movement. Peak period volumes measured three hours in the AM peak period and four hours in the PM peak period. AM peak period volumes were multiplied by 0.4, while the PM peak period volumes were multiplied by 0.3 to develop AM and PM peak hourly volumes. The factor was based on the number of hours in the timeframe and rounded up to produce a conservative estimate. This methodology was applied to both the 2040 June and 2040 December models. The 2040 June and December forecast volumes were compared. The 2040 December forecasts were higher (in general by two to five percent) and therefore were used moving forward.

The MAG model had volumes which were lower than expected or did not generate turning movement volumes at several intersections. The estimated 2040 forecast volumes were compared to the existing volumes United Civil Group collected in October 2021. Two intersections (Vistancia Boulevard/Happy Valley Road and SR 303L/Happy Valley Parkway) had a total of seven turning movements which had lower than expected turning movements. For those turning movements, a one percent yearly growth rate was applied to the corresponding existing turning movement counts to complete the 2040 AM and PM peak hour forecasts. The segment of roadway along Happy Valley Parkway between Vistancia Boulevard and SR 303L has a negative one percent growth rate in the future, and therefore the one percent growth rate applied is a conservative value.

Two locations at the SR 303L and El Mirage Road TI needed additional adjustments because they did not have existing turning movements and no volumes were generated by the 2040 forecast model. For these two movements (southbound left and westbound right) the same volumes were assumed as for the corresponding movements at the SR 303L and Happy Valley Parkway TI. This is also a conservative approach as it adds more traffic to the roadway network. MAG concurred with this traffic volume development approach. Figure 4-1 summarizes the 2040 AM and PM peak hour forecasts. These volumes were used for future year traffic analysis.

Figure 4-1: 2040 Lane Configurations and AM/PM Peak Hour Turning Movements





## El Mirage Road

SR 303L to Jomax Road Feasibility Study

### 4.2 2040 Traffic Operations Analysis

The Design Concept Report for Jomax Road, El Mirage Road to Tierra Del Rio Boulevard (Kimley-Horn, November 2019) recommended an alternative for this section of studied roadway. A traffic report was included in the appendix of the DCR for Jomax Road which analyzed and made recommendations on the configuration for the Jomax Road and El Mirage Road intersection based on 2040 traffic volumes. This traffic report was reviewed as part of this study and the recommended intersection configuration was used as a basis for further analysis. The DCR concept was modified to two through lanes on all approaches at the Jomax Road intersection based on the 2040 traffic volumes from this study.

The 2040 volumes were input into Synchro 11 traffic simulation software to analyze the LOS of each project intersection. Table 4-1 shows the estimated 2040 LOS during the AM peak hour at all the project intersections (shown in Figure 4-1). All intersections and approaches operate at LOS D or better and no turning movements experience LOS F during the AM peak hour except for Happy Valley Road & Vistancia Boulevard (Int 2). This intersection reaches LOS F for multiple turning movements (southbound through and right turns, shown in appendix), indicating significant congestion. (Note: this intersection was evaluated as a four-legged intersection.)

The intersection of Happy Valley Road & El Mirage Road operates at LOS C but has turning movements experiencing LOS E (northbound right turns and westbound left turns, shown in appendix). This is an indication of increasing congestion, and the potential for some movements to reach LOS F in the future. The precise time that occurs will be dependent upon the rate of new development in the area and may occur before 2040.

Table 4-1: 2040 AM Peak Hour LOS

#	Intersection	Overall		Eastbound		Westbound		Northbound		Southbound	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	SR 303L SPUi & Happy Valley Pkwy Ramps <sup>(1)</sup>	C	27.2	C	29.6	B	19.8	C	28.5	D	52.8
2	Happy Valley Road & Vistancia Boulevard	D	46.1	D	40.1	D	37.7	C	26.5	F	81.5
3	Happy Valley Rd & 121st Ln <sup>(3)(4)</sup>	A	0.8	B	11.3	A	0.0	-	-	D	29.2
4	Happy Valley Rd & El Mirage Rd	C	22.2	C	23.4	B	13.6	C	29.6	C	23.4
5	El Mirage & Coldwater Ranch <sup>(2)</sup>	A	1.4	-	-	C	23.9	A	0.0	A	8.5
6	El Mirage Rd & Blue Sky Dr	C	21.6	B	20.0	-	-	B	13.4	C	27.7
7	Dysart Rd & Happy Valley Rd	B	15.9	B	16.7	B	11.6	-	-	B	18.8
8	SR 303L & EB El Mirage Rd TI EB-Ramps	D	35.9	D	41.5	-	-	D	39.3	B	16.8
9	SR 303L & WB El Mirage Rd TI WB-Ramps	B	17.3	-	-	B	15.4	A	4.1	C	33.6
11	El Mirage Road & Jomax Road	C	30.4	C	27.8	B	14.9	C	27.5	D	42.0

(1) - NB & SB delays reported are for left turns

(2) - WB & SB delay reported is for left turn

(3) - EB delay reported is for left turn

(4) - SB delay reported is for left turn

Table 4-2 shows the estimated 2040 LOS during the PM peak hour at all the project intersections (shown in Figure 4-1). As shown in the table, all intersections operate at LOS D or better except for Happy Valley Road & Vistancia Boulevard (Int 2) which operates at LOS F. This intersection reaches LOS F for multiple turning movements (eastbound left turns, northbound left turns, and southbound through/right turns, shown in appendix), and in fact only two of the twelve turning movements at this intersection operate at better than LOS E. This is a clear indication of extreme congestion during the PM peak hour.

Three intersections operate with turning movements that reach LOS E: Happy Valley Road at 121<sup>st</sup> Avenue, El Mirage Road at Coldwater Ranch Road, and El Mirage Road at Happy Valley Road. These intersection exhibit indications of

increasing congestion, and the potential for some movements to reach LOS F in the future. The precise time that occurs will be dependent upon the rate of new development in the area and may occur even before 2040.

Table 4-2: 2040 PM Peak Hour LOS

#	Intersection	Overall		Eastbound		Westbound		Northbound		Southbound	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
1	SR303L SPUi & Happy Valley Pkwy Ramps <sup>(1)</sup>	C	29.1	C	22.3	C	33.7	D	35.3	D	52.9
2	Happy Valley Road & Vistancia Boulevard	F	119.1	C	29.4	E	69.1	F	150.3	F	146.5
3	Happy Valley Rd & 121st Ln <sup>(3)(4)</sup>	A	8.0	E	47.5	A	0.0	-	-	C	24.6
4	Happy Valley Rd & El Mirage Rd	C	32.3	C	31.2	C	27.2	D	39.8	D	38.4
5	El Mirage & Coldwater Ranch <sup>(2)</sup>	A	1.7	-	-	E	37.6	A	0.0	B	10.4
6	El Mirage Rd & Blue Sky Dr	B	19.4	B	19.0	-	-	B	12.3	C	31.4
7	Dysart Rd & Happy Valley Rd	B	13.0	B	12.7	A	6.9	-	-	B	19.9
8	SR 303L & EB El Mirage Rd TI EB-Ramps	C	28.0	D	51.1	-	-	C	20.1	B	15.5
9	SR 303L & WB El Mirage Rd TI WB-Ramps	C	29.2	-	-	C	21.6	C	29.1	D	35.5
11	El Mirage Road & Jomax Road	C	26.9	C	20.4	C	23.1	D	36.8	C	24.4

(1) - NB & SB delays reported are for left turns

(2) - WB & SB delay reported is for left turn

(3) - EB delay reported is for left turn

(4) - SB delay reported is for left turn

### 4.3 El Mirage Road at Happy Valley Road and Jomax Road Intersection Options

The intersections of El Mirage Road at Happy Valley Road and at Jomax Road are new signalized intersection to be added with the extension of El Mirage Road. A request was made to assess whether dual left turn lanes on all approaches provide any significant operational benefit over single left turn lanes. A single left turn lane would provide a narrower footprint at each approach, while the dual left turn lanes would provide a wider footprint. For the alternatives evaluation process (Section 5.1.2), it was assumed that the additional lane would be used for a second left-turn lane at each approach, but it should be noted that the additional width could accommodate an additional through lane instead, providing added future flexibility should the need arise beyond the 2040 horizon analysis year.

#### 4.3.1 El Mirage Road: SR 303L to Happy Valley Road

The 2040 MAG volumes were used to evaluate the traffic operations of each intersection option, assuming the single versus dual left-turn lane alternatives. The volumes were input into Synchro 11 traffic simulation software to analyze the LOS of each option. Figure 4-2 shows the two options for the El Mirage Road and Happy Valley Road intersection. Both alternatives depict Happy Valley Road in its ultimate six-lane configuration, with El Mirage Road shown in its interim four-lane configuration. The geometric difference between the two alternatives is the number of left-turn lanes at the intersection. Intersection Option 1 includes a single left-turn lane on all approaches while Intersection Option 2 has dual left-turn lanes on all approaches.

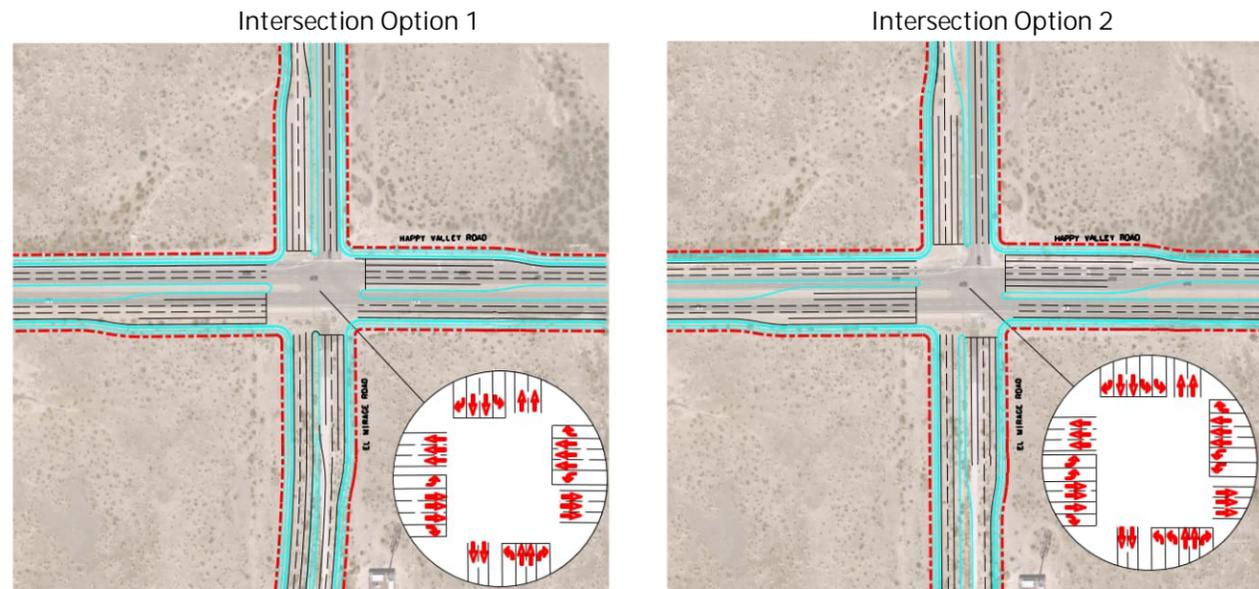
Ten performance measures were identified to determine to what extent each alternative meets each criterion and documents the final determination for the selection of the preferred build alternative.



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

Figure 4-2: El Mirage Road & Happy Valley Road (Single vs. Dual Left-turn lanes)



The different configurations result in varying LOS between the alternatives. For the operational analysis, the cycle lengths for the alternatives were the same at 90 seconds. All left-turn movements for single lefts were protected/permisive, meaning left turning vehicles could turn on a green arrow first and then would have to yield to oncoming traffic during the rest of the cycle. All left-turn movements for dual lefts were protected-only, meaning left turning vehicles could turn on a green arrow only and a red arrow was shown during the rest of the cycle. Table 4-3 summarizes the LOS for both peak hours with dual left turn lanes. When comparing to single left turn lanes on all approaches (Table 4-1), dual left turn lanes measurably reduce delay at the intersection.

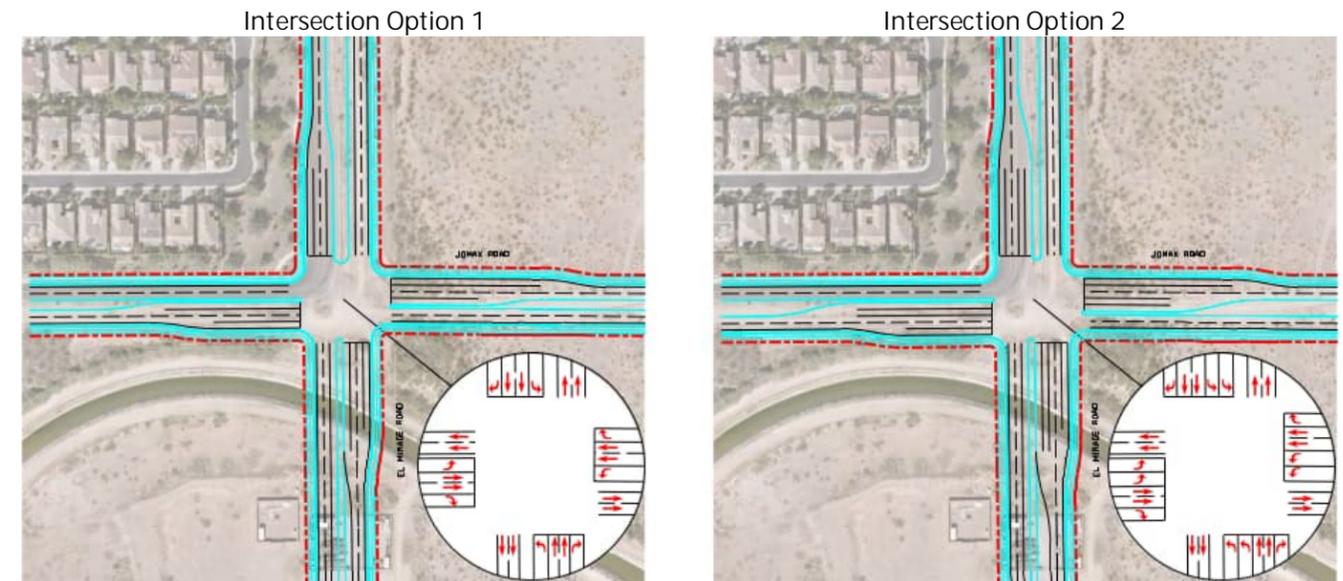
Table 4-3: Dual Left Turn Lane 2040 LOS at El Mirage Road & Happy Valley Road

#	Time Period	Overall		Eastbound		Westbound		Northbound		Southbound	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
4	AM Peak	C	23.3	B	19.0	B	13.8	C	30.1	C	32.1
4	PM Peak	C	26.8	C	21.7	B	19.4	D	39.5	D	38.0

### 4.3.2 El Mirage Road: Happy Valley Road to Jomax Road

As with the other intersection, 2040 MAG volumes were input into Synchro 11 traffic simulation software to analyze the LOS. Figure 4-3 shows the two options for El Mirage Road and Jomax Road with the reduced number of through lanes on El Mirage Road from three to two lanes. Both intersection options assume the northbound approach is on a north-south tangent section over the Beardsley Canal. The future bridge design will need to accommodate the intersection cross-section. Existing maintenance access should remain but will likely need realignment.

Figure 4-3: El Mirage Road & Jomax Road (Single vs. Dual Left-turn lanes)



As with the other intersection, the same operation analysis parameters were used to evaluation this intersection. Table 4-4 summarizes the LOS for both peak hours with dual left turn lanes. When comparing to single left turn lanes (Table 4-2) on all approached, dual left turn lanes do not provide an operational benefit.

Table 4-4: Dual Left Turn Lane 2040 LOS at El Mirage Road & Jomax Road

#	Time Period	Overall		Eastbound		Westbound		Northbound		Southbound	
		LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
11	AM Peak	C	32.2	C	28.1	B	16.9	C	29.7	D	45.2
11	PM Peak	C	28.3	C	21.5	C	24.8	D	37.3	C	27.1

### 4.4 Mitigating Intersection Congestion

Happy Valley Road at Vistancia Boulevard currently experiences significant suggestion as indicated in the existing conditions analysis. The City of Peoria is currently evaluating this intersection to determine improvements through a separate study.

The unsignalized intersections at Happy Valley Road and 121<sup>st</sup> Lane and El Mirage Road and Coldwater Ranch operate at LOS E in the PM peak hour for the stop-controlled movement only. Consideration should be taken to potentially prohibit the southbound left-turn movement from 121<sup>st</sup> Lane if safety issues arise. The project team recommends that the local agency perform a traffic signal warrant analysis and install traffic signals at the El Mirage Road and Coldwater Ranch when warranted.



## 5. Analysis of Alignment Alternatives

Chapters 3 and 4 described alignment alternatives, intersection options and traffic operational performance. Screening Criteria and Performance Measures Section 3.4 described evaluation criteria and performance measures to be used for comparatively evaluating each alignment alternative and intersection option.

### 5.1 Comparative Assessment of Alternative Performance

#### 5.1.1 Roadway Alignment Alternative Evaluation

The alternatives screening matrix that documents the screening of each roadway alignment alternative and documents the final determination for the selection of the preferred build alternative is found in Table 5-1.

The degree to which an alternative met each criterion was measured using a high-medium-low scale. The scale is graphically represented using the following symbols.

- Highest Performing/Lowest Impact – ●
- ◐ Medium Performing/Moderate Impact – ◐
- Lowest Performing/Highest Impact – ○

Table 5-1: Alignment Alternative Screening Matrix

Category	Criteria	Performance Measure	Alignment Alternatives		
			Alternative #1 Alignment	Alternative #2 Alignment	Alternative #3 Alignment
Drainage and Floodplain Impacts	Area of impact to existing floodplains	Permitting processing time and potential ROW costs	◐ 1,150' length portion of roadway within 100-year flood plain	● 1,060' of roadway within 100-year flood plain	○ 1,700' of roadway within 100-year flood plain
	Impacts to existing drainage facilities	Capital cost to remove existing structures	● No discernable difference	● No discernable difference	● No discernable difference
	Long-term maintenance impacts	Long-term maintenance cost/effort	◐ Moderate length portion of roadway within 100-year flood plain	● Shortest portion of roadway within 100-year flood plain	○ Longest portion of roadway within 100-year flood plain
Multimodal Opportunities	Pedestrian accommodations	Connectivity to trail system	● No discernable difference	● No discernable difference	● No discernable difference
		Number of conflict points	● No discernable difference	● No discernable difference	● No discernable difference
	Bicycle accommodations	Locations of bike lanes	● No discernable difference	● No discernable difference	● No discernable difference
		Ability to provide connectivity to trail systems	● No discernable difference	● No discernable difference	○ 1,700' of roadway within 100-yr flood plain and bounded by substation
		Number of conflict points	● No discernable difference	● No discernable difference	● No discernable difference
ROW Impacts	Area of impact	Area of ROW required	○ 7,175' roadway alignment	◐ 6,850' roadway alignment	● 6,650' roadway alignment
	Remnant parcels	Size of remaining remnant parcels	◐ Moderate remnant parcels	○ Smallest remnant parcels	● Largest remaining remnant parcels
	Private parcels impacted	Number of private parcels impacted	○ 5 private parcels	◐ 4 private parcels	● 4 private parcels
Agency Acceptance	Local agency acceptance	Ability to gain local agency support	● Most similar to previously approved concept design (2008)	◐ Next most similar to previously approved concept design (2008)	○ Least similar to previously approved concept design (2008) along with other factors in this table
Environmental Considerations/ Sustainability	Potential impact to environmental resources	ROW, floodplains, and permitting requirements	○ 149,850 SF of roadway within 100-yr flood plain	● 138,917 SF of roadway within 100-yr flood plain	◐ 147,720 SF of roadway within 100-yr flood plain
Compatibility with Area development	Provides for future access to El Mirage Road	Potential locations that could provide future access	● No discernable difference	● No discernable difference	○ 1,700' of roadway within 100-yr flood plain and bounded by substation
Potential Utility Impacts	Utilities to be relocated	Number of relocated utilities	● Impacts zero existing transmission towers	◐ Impacts one existing transmission tower	● Impacts zero existing transmission towers
Roadway Geometrics	Roadway design meet standards	Compared to minimum requirements	● Curves exceed requirements – 2% superelevation required, exceeds tangent requirement	◐ Curves greatly exceed requirements – Normal crown can be used, largest tangents between curves	○ Near minimum – 4% superelevation required, meets tangent requirement



5.1.2 Intersection Option Evaluation

The options screening matrix that documents the screening of each intersection option and documents the final determination for the selection of the preferred build alternative is found in Table 5-2. The matrix was used to compare the intersection options at both the Happy Valley Road and Jomax Road alternatives.

Qualitative and quantitative metrics were used to compare the alternatives. The degree to which an alternative met each criterion was measured using a high-low scale. The scale is graphically represented using the following symbols.

- Higher Performing – ●
- Lower Performing – ○

Table 5-2: Intersection Option Screening Matrix

Category	Criteria	Performance Measure	Happy Valley Rd Intersection Alternatives				Jomax Rd Intersection Alternatives			
			Intersection Option 1 (Single Left-Turns)		Intersection Option 2 (Dual Left-Turns)		Intersection Option 1 (Single Left-Turns)		Intersection Option 2 (Dual Left-Turns)	
Traffic Operational Performance	Overall Intersection operations	Level of Service	●	No discernable difference AM delay is less, PM is more	●	No discernable difference AM delay is more, PM is less	●	AM delay is 1.7 s/veh less PM delay is 1.1 s/veh less	○	AM delay is 1.3 s/veh more PM delay is 1.1 s/veh more
	Individual movement operations	Level of Service	●	No discernable difference (AM Northbound LOS "D" PM Southbound LOS "C")	●	No discernable difference (AM Northbound LOS "C" PM Southbound LOS "D")	●	AM Westbound LOS "B"	○	AM Westbound LOS "C"
Multimodal Opportunities	Pedestrian accommodations	Connectivity to trail system	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference
		Number of conflict points	●	4 fewer conflict points	○	4 more conflict points	●	4 fewer conflict points	○	4 more conflict points
	Bicycle accommodations	Locations of bike lanes	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference
		Ability to provide connectivity to trail systems	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference
		Number of conflict points	●	4 fewer conflict points	○	4 more conflict points	●	4 fewer conflict points	○	4 more conflict points
Right-of-Way Impacts	Area of impact	Area of right-of-way required	●	Less ROW needed	○	More ROW needed	●	Less ROW needed	○	More ROW needed
	Remnant parcels	Area of remaining remnant parcels	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference
Agency Acceptance	Local agency acceptance	Ability to gain local agency support	●	City of Peoria prefers single left-turns	○	City of Peoria does not prefer dual left-turns	●	City of Peoria prefers single left-turns	○	City of Peoria does not prefer dual left-turns
Environmental Considerations/ Sustainability	Potential impact to environmental resources	Right-of-way, floodplains, and permitting requirements	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference
Potential Utility Impacts	Utilities to be relocated	Number of relocated utilities	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference
Roadway Geometrics	Roadway design meet standards	Compared to minimum requirements	●	No discernable difference	●	No discernable difference	●	No discernable difference	●	No discernable difference



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

## 5.2 Planning Level Cost Opinions

This section shows the planning level cost opinions for the three roadway alternatives as well as the two intersection alternatives at Happy Valley Road and Jomax Road. The estimates were developed for the ultimate six-lane roadway corridor using the MCDOT typical section show in Figure 3-2. Planning-level cost opinions are developed based on limited project information, use broad assumptions, and are used to develop an initial understanding of the possible cost for a project. Some of the assumptions used include:

- Pavement section assumes six inches of aggregate base course and six inches of asphaltic concrete pavement
- New signals are included at the El Mirage Road intersections at Happy Valley Road, Jomax Road, and the SR 303L TI
- Includes a High-Intensity Activated Crosswalk (HAWK) signal at McMicken trail crossing
- Includes a bridge crossing of the Beardsley Canal with at-grade maintenance road access
- Does not include a potential bridge crossing of the McMicken Outlet Channel
- Includes conduit and fiber optic cable only along the roadway alignments
- Utility relocation cost are an assumed amount and will need to be further defined during future project development.
- The estimates do not include any administrative costs that may be incurred
- Right-of-Way accommodates a 130' typical section and does not include a public utility easement
- Project Wide Unidentified Items include non-measured items such as:
  - Impacts to floodplain and floodway
  - Impacts on the FCDMC McMicken Outfall Channel
  - Potential noise walls
  - Other items not quantified at a concept level, but would be needed for construction of the project
- Predesign costs include items such as:
  - Development of a design concept report to further define the corridor design and requirements
  - Environmental documentation if Federal Funds are used
  - Utility coordination
- Final design costs include items such as:
  - Lighting analysis and design
  - Noise analysis and noise wall design, if required
  - Utility coordination
  - Development of final right-of-way limits
  - Development of a FEMA Conditional Letter of Map Revision (CLOMR) – The Letter of Map Revision (LOMR) would be completed after construction
  - Development of plans specifications and estimates

### MARICOPA ASSOCIATION OF GOVERNMENTS PLANNING-LEVEL CONSTRUCTION COST ESTIMATE SUMMARY - ALTERNATIVE 1

PROJECT NAME:		PROJECT DESCRIPTION: New Arterial			
ROUTE:		ESTIMATE LEVEL: Concept			
PROJECT LIMITS:		BASE YEAR: FY 2022			
LENGTH:		DATE: 6/30/2022			
ITEM	MAJOR ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
<b>EARTHWORK</b>					
	CLEARING & REMOVALS	ACRE	33.64	\$ 2,500.00	84,100
	ROADWAY EXCAVATION	CU.YD.	4,681	\$ 13.00	60,850
	BORROW	CU.YD.	61,482	\$ 17.00	1,045,190
	SUBGRADE TREATMENT	SQ.YD.	109,457	\$ 17.00	1,860,770
	FURNISH WATER	LSUM	1	\$ 25,000.00	25,000
	<b>TOTAL ITEM 200</b>				<b>3,075,910</b>
<b>BASE AND SURFACE TREATMENT</b>					
	AGGREGATE BASE	SQ.YD.	109,457	\$ 9.00	985,110
	ASPHALT PAVEMENT	SQ.YD.	122,057	\$ 36.00	4,394,050
	ARAC SURFACE	SQ.YD.	0	\$ 8.00	0
	<b>TOTAL ITEM 300 &amp; 400</b>				<b>5,379,160</b>
<b>DRAINAGE</b>					
	DRAINAGE SYSTEM (CLOSED)	L.FT.	12,100	\$ 250.00	3,025,000
	DRAINAGE SYSTEM (CONVEYANCE CHANNEL)	L.FT.	1,900	\$ 477.00	906,300
	PIPE CULVERTS	L.FT.	750	\$ 460.00	345,000
	<b>TOTAL ITEM 500</b>				<b>4,276,300</b>
<b>STRUCTURES</b>					
	BEARDSLEY CANAL BRIDGE	SQ.FT.	16,800	\$ 219.00	3,679,200
	BOX CULVERT	L.FT./CELL	750	\$ 1,712.00	1,284,000
	<b>TOTAL ITEM 600</b>				<b>4,963,200</b>
<b>TRAFFIC ENGINEERING</b>					
	SIGNING (STREET)	MILE	2.29	\$ 97,000.00	222,130
	PAVEMENT MARKING	LANE-MILE	13.74	\$ 4,600.00	63,200
	LIGHTING	MILE	2.29	\$ 500,000.00	1,145,000
	TRAFFIC SIGNAL	EACH	3	\$ 400,000.00	1,200,000
	INTELLIGENT TRANSPORTATION SYSTEM (ITS)	MILE	2.29	\$ 130,000.00	297,700
	HAWK SIGNAL	LSUM	1	\$ 150,000.00	150,000
	<b>TOTAL ITEM 700</b>				<b>3,078,030</b>
<b>ROADSIDE DEVELOPMENT</b>					
	LANDSCAPING AND TOPSOIL	SQ.YD.	37,211	\$ 17.00	632,590
	UTILITY RELOCATION	LSUM	1	\$ 50,000.00	50,000
	<b>TOTAL ITEM 800</b>				<b>682,590</b>
<b>INCIDENTALS</b>					
	CURB & GUTTER	L.FT.	48,400	\$ 30.00	1,452,000
	SIDEWALK	SQ.YD.	16,133	\$ 90.00	1,451,970
	<b>TOTAL ITEM 900</b>				<b>2,903,970</b>
<b>SUBTOTAL A (ITEMS SUBTOTAL)</b>					<b>\$24,359,200</b>
<b>PW PROJECT WIDE</b>					
	TRAFFIC CONTROL (2% OF SUBTOTAL A)			2.0%	487,200
	QUALITY CONTROL (1% OF SUBTOTAL A)			1.0%	243,600
	CONSTRUCTION SURVEYING (1.5% OF SUBTOTAL A)			1.5%	365,400
	EROSION CONTROL (1% OF SUBTOTAL A)			1.0%	243,600
	MOBILIZATION (8% OF SUBTOTAL A)			8.0%	1,948,700
	UNIDENTIFIED ITEMS (20% OF SUBTOTAL A)			20.0%	4,871,800
<b>BASE YEAR CONSTRUCTION COST (EXCLUDING BELOW THE LINE ITEMS, UTILITIES &amp; R/W)</b>					<b>\$32,519,500</b>
<b>INFL BELOW THE LINE ITEMS</b>					
	POST DESIGN SERVICES (1% OF BASE YEAR CONSTRUCTION COST)			1.0%	325,200
	CONSTRUCTION CONTINGENCIES (5% OF BASE YEAR CONSTRUCTION COST)			5.0%	1,626,000
	CONSTRUCTION ENGINEERING (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	2,601,600
<b>TOTAL ESTIMATED CONSTRUCTION COST (EXCLUDING UTILITIES &amp; R/W)</b>					<b>\$37,072,300</b>
<b>DES PREDESIGN AND FINAL DESIGN</b>					
	PREDESIGN/NEPA/PI SERVICES (3% OF BASE YEAR CONSTRUCTION COST)			3.0%	975,600
	FINAL DESIGN SERVICES (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	2,601,600
<b>TOTAL ESTIMATED DESIGN COST</b>					<b>\$3,577,200</b>
<b>R/W RIGHT-OF-WAY</b>					
	RIGHT-OF-WAY	ACRES	36.24	\$ 250,000.00	9,060,000
<b>TOTAL ESTIMATED RIGHT-OF-WAY COSTS</b>					<b>\$9,060,000</b>
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$49,710,000</b>



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

## MARICOPA ASSOCIATION OF GOVERNMENTS PLANNING-LEVEL COST ESTIMATE SUMMARY - ALTERNATIVE 2

ITEM	MAJOR ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
<b>EARTHWORK</b>					
	CLEARING & REMOVALS	ACRE	33.02	\$ 2,500.00	82,550
	ROADWAY EXCAVATION	CU.YD.	4,656	\$ 13.00	60,530
	BORROW	CU.YD.	59,288	\$ 17.00	1,007,900
	SUBGRADE TREATMENT	SQ.YD.	109,457	\$ 17.00	1,860,770
	FURNISH WATER	LSUM	1	\$ 25,000.00	25,000
	<b>TOTAL ITEM 200</b>				<b>3,036,750</b>
<b>BASE AND SURFACE TREATMENT</b>					
	AGGREGATE BASE	SQ.YD.	109,457	\$ 9.00	985,110
	ASPHALT PAVEMENT	SQ.YD.	121,611	\$ 36.00	4,378,000
	ARAC SURFACE	SQ.YD.	0	\$ 8.00	0
	<b>TOTAL ITEM 300 &amp; 400</b>				<b>5,363,110</b>
<b>DRAINAGE</b>					
	DRAINAGE SYSTEM (CLOSED)	LFT.	11,900	\$ 250.00	2,975,000
	DRAINAGE SYSTEM (CONVEYANCE CHANNEL)	LFT.	2,300	\$ 477.00	1,097,100
	PIPE CULVERTS	LFT.	750	\$ 460.00	345,000
	<b>TOTAL ITEM 500</b>				<b>4,417,100</b>
<b>STRUCTURES</b>					
	BEARDSLEY CANAL BRIDGE	SQ.FT.	16,800	\$ 219.00	3,679,200
	BOX CULVERT	LFT./CELL	560	\$ 1,712.00	958,720
	<b>TOTAL ITEM 600</b>				<b>4,637,920</b>
<b>TRAFFIC ENGINEERING</b>					
	SIGNING (STREET)	MILE	2.25	\$ 97,000.00	218,250
	PAVEMENT MARKING	LANE-MILE	13.50	\$ 4,600.00	62,100
	LIGHTING	MILE	2.25	\$ 500,000.00	1,125,000
	TRAFFIC SIGNAL	EACH	3	\$ 400,000.00	1,200,000
	INTELLIGENT TRANSPORTATION SYSTEM (ITS)	MILE	2.25	\$ 130,000.00	292,500
	HAWK SIGNAL	LSUM	1	\$ 150,000.00	150,000
	<b>TOTAL ITEM 700</b>				<b>3,047,850</b>
<b>ROADSIDE DEVELOPMENT</b>					
	LANDSCAPING AND TOPSOIL	SQ.YD.	34,488	\$ 17.00	586,300
	UTILITY RELOCATION	LSUM	1	\$ 2,050,000.00	2,050,000
	<b>TOTAL ITEM 800</b>				<b>2,636,300</b>
<b>INCIDENTALS</b>					
	CURB & GUTTER	LFT.	47,600	\$ 30.00	1,428,000
	SIDEWALK	SQ.YD.	15,867	\$ 90.00	1,428,030
	<b>TOTAL ITEM 900</b>				<b>2,856,030</b>
<b>SUBTOTAL A (ITEM SUBTOTAL)</b>					<b>\$25,995,100</b>
<b>PW PROJECT WIDE</b>					
	TRAFFIC CONTROL (2% OF SUBTOTAL A)			2.0%	519,900
	QUALITY CONTROL (1% OF SUBTOTAL A)			1.0%	260,000
	CONSTRUCTION SURVEYING (1.5% OF SUBTOTAL A)			1.5%	389,900
	EROSION CONTROL (1% OF SUBTOTAL A)			1.0%	260,000
	MOBILIZATION (8% OF SUBTOTAL A)			8.0%	2,079,600
	UNIDENTIFIED ITEMS (20% OF SUBTOTAL A)			20.0%	5,199,000
<b>BASE YEAR CONSTRUCTION COST (EXCLUDING BELOW THE LINE ITEMS, UTILITIES &amp; R/W)</b>					<b>\$34,703,500</b>
<b>INFL BELOW THE LINE ITEMS</b>					
	POST DESIGN SERVICES (1% OF BASE YEAR CONSTRUCTION COST)			1.0%	347,000
	CONSTRUCTION CONTINGENCIES (5% OF BASE YEAR CONSTRUCTION COST)			5.0%	1,735,200
	CONSTRUCTION ENGINEERING (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	2,776,300
<b>TOTAL ESTIMATED CONSTRUCTION COST (EXCLUDING UTILITIES &amp; R/W)</b>					<b>\$39,562,000</b>
<b>DES PREDESIGN AND FINAL DESIGN</b>					
	PREDESIGN/NEPA/PI SERVICES (3% OF BASE YEAR CONSTRUCTION COST)			3.0%	1,041,100
	FINAL DESIGN SERVICES (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	2,776,300
<b>TOTAL ESTIMATED DESIGN COST</b>					<b>\$3,817,400</b>
<b>R/W RIGHT-OF-WAY</b>					
	RIGHT-OF-WAY	ACRES	35.53	\$ 250,000.00	8,882,500
<b>TOTAL ESTIMATED RIGHT-OF-WAY COSTS</b>					<b>\$8,882,500</b>
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$52,262,000</b>

## MARICOPA ASSOCIATION OF GOVERNMENTS PLANNING-LEVEL COST ESTIMATE SUMMARY - ALTERNATIVE 3

ITEM	MAJOR ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
<b>EARTHWORK</b>					
	CLEARING & REMOVALS	ACRE	33.10	\$ 2,500.00	82,750
	ROADWAY EXCAVATION	CU.YD.	4,449	\$ 13.00	57,840
	BORROW	CU.YD.	58,168	\$ 17.00	988,860
	SUBGRADE TREATMENT	SQ.YD.	109,457	\$ 17.00	1,860,770
	FURNISH WATER	LSUM	1	\$ 25,000.00	25,000
	<b>TOTAL ITEM 200</b>				<b>3,015,220</b>
<b>BASE AND SURFACE TREATMENT</b>					
	AGGREGATE BASE	SQ.YD.	109,457	\$ 9.00	985,110
	ASPHALT PAVEMENT	SQ.YD.	117,844	\$ 36.00	4,242,380
	ARAC SURFACE	SQ.YD.	0	\$ 8.00	0
	<b>TOTAL ITEM 300 &amp; 400</b>				<b>5,227,490</b>
<b>DRAINAGE</b>					
	DRAINAGE SYSTEM (CLOSED)	LFT.	11,680	\$ 250.00	2,920,000
	DRAINAGE SYSTEM (CONVEYANCE CHANNEL)	LFT.	1,800	\$ 477.00	858,600
	PIPE CULVERTS	LFT.	560	\$ 460.00	257,600
	<b>TOTAL ITEM 500</b>				<b>4,036,200</b>
<b>STRUCTURES</b>					
	BEARDSLEY CANAL BRIDGE	SQ.FT.	16,800	\$ 219.00	3,679,200
	BOX CULVERT	LFT./CELL	800	\$ 1,712.00	1,369,600
	<b>TOTAL ITEM 600</b>				<b>5,048,800</b>
<b>TRAFFIC ENGINEERING</b>					
	SIGNING (STREET)	MILE	2.21	\$ 97,000.00	214,370
	PAVEMENT MARKING	LANE-MILE	13.26	\$ 4,600.00	61,000
	LIGHTING	MILE	2.21	\$ 500,000.00	1,105,000
	TRAFFIC SIGNAL	EACH	3	\$ 400,000.00	1,200,000
	INTELLIGENT TRANSPORTATION SYSTEM (ITS)	MILE	2.21	\$ 130,000.00	287,300
	HAWK SIGNAL	LSUM	1	\$ 150,000.00	150,000
	<b>TOTAL ITEM 700</b>				<b>3,017,670</b>
<b>ROADSIDE DEVELOPMENT</b>					
	LANDSCAPING AND TOPSOIL	SQ.YD.	35,168	\$ 17.00	597,860
	UTILITY RELOCATION	LSUM	1	\$ 50,000.00	50,000
	<b>TOTAL ITEM 800</b>				<b>647,860</b>
<b>INCIDENTALS</b>					
	CURB & GUTTER	LFT.	46,720	\$ 30.00	1,401,600
	SIDEWALK	SQ.YD.	15,573	\$ 90.00	1,401,570
	<b>TOTAL ITEM 900</b>				<b>2,803,170</b>
<b>SUBTOTAL A (ITEM SUBTOTAL)</b>					<b>\$23,796,400</b>
<b>PW PROJECT WIDE</b>					
	TRAFFIC CONTROL (2% OF SUBTOTAL A)			2.0%	475,900
	QUALITY CONTROL (1% OF SUBTOTAL A)			1.0%	238,000
	CONSTRUCTION SURVEYING (1.5% OF SUBTOTAL A)			1.5%	356,900
	EROSION CONTROL (1% OF SUBTOTAL A)			1.0%	238,000
	MOBILIZATION (8% OF SUBTOTAL A)			8.0%	1,903,700
	UNIDENTIFIED ITEMS (20% OF SUBTOTAL A)			20.0%	4,759,300
<b>BASE YEAR CONSTRUCTION COST (EXCLUDING BELOW THE LINE ITEMS, UTILITIES &amp; R/W)</b>					<b>\$31,768,200</b>
<b>INFL BELOW THE LINE ITEMS</b>					
	POST DESIGN SERVICES (1% OF BASE YEAR CONSTRUCTION COST)			1.0%	317,700
	CONSTRUCTION CONTINGENCIES (5% OF BASE YEAR CONSTRUCTION COST)			5.0%	1,588,400
	CONSTRUCTION ENGINEERING (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	2,541,500
<b>TOTAL ESTIMATED CONSTRUCTION COST (EXCLUDING UTILITIES &amp; R/W)</b>					<b>\$36,215,800</b>
<b>DES PREDESIGN AND FINAL DESIGN</b>					
	PREDESIGN/NEPA/PI SERVICES (3% OF BASE YEAR CONSTRUCTION COST)			3.0%	953,000
	FINAL DESIGN SERVICES (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	2,541,500
<b>TOTAL ESTIMATED DESIGN COST</b>					<b>\$3,494,500</b>
<b>R/W RIGHT-OF-WAY</b>					
	RIGHT-OF-WAY	ACRES	34.84	\$ 250,000.00	8,710,000
<b>TOTAL ESTIMATED RIGHT-OF-WAY COSTS</b>					<b>\$8,710,000</b>
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$48,420,000</b>



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

## MARICOPA ASSOCIATION OF GOVERNMENTS PLANNING-LEVEL COST ESTIMATE SUMMARY - Intersection with Single Left-Turn Lanes

PROJECT NAME:		PROJECT DESCRIPTION: New Arterial			
ROUTE:		ESTIMATE LEVEL: Concept			
PROJECT LIMITS:		BASE YEAR: FY 2022			
LENGTH:		DATE: 6/30/2022			
ITEM	MAJOR ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
	<b>EARTHWORK</b>				
	CLEARING & REMOVALS	ACRE	3.94	\$ 2,500.00	9,850
	ROADWAY EXCAVATION	CU.YD.	1,042	\$ 13.00	13,550
	BORROW	CU.YD.	1,042	\$ 17.00	17,710
	SUBGRADE TREATMENT	SQ.YD.	6,255	\$ 17.00	106,340
	FURNISH WATER	L.SUM	1	\$ 5,000.00	5,000
	<b>TOTAL ITEM 200</b>				<b>152,450</b>
	<b>BASE AND SURFACE TREATMENT</b>				
	AGGREGATE BASE	SQ.YD.	6,656	\$ 9.00	59,900
	ASPHALT PAVEMENT	SQ.YD.	19,665	\$ 36.00	707,940
	ARAC SURFACE	SQ.YD.	0	\$ 8.00	0
	<b>TOTAL ITEM 300 &amp; 400</b>				<b>767,840</b>
	<b>DRAINAGE</b>				
	DRAINAGE SYSTEM (CLOSED)	L.FT.	0	\$ 250.00	0
	DRAINAGE SYSTEM (CONVEYANCE CHANNEL)	L.FT.	0	\$ 477.00	0
	PIPE CULVERTS	L.FT.	0	\$ 460.00	0
	<b>TOTAL ITEM 500</b>				<b>0</b>
	<b>STRUCTURES</b>				
	BEARDSLEY CANAL BRIDGE	SQ.FT.	0	\$ 219.00	0
	BOX CULVERT	L.FT./CELL	0	\$ 1,712.00	0
	<b>TOTAL ITEM 600</b>				<b>0</b>
	<b>TRAFFIC ENGINEERING</b>				
	SIGNING (STREET)	MILE	0.00	\$ 97,000.00	0
	PAVEMENT MARKING	LANE-MILE	0.00	\$ 4,600.00	0
	LIGHTING	MILE	0.00	\$ 500,000.00	0
	TRAFFIC SIGNAL	EACH	0	\$ 400,000.00	0
	<b>TOTAL ITEM 700</b>				<b>0</b>
	<b>ROADSIDE DEVELOPMENT</b>				
	LANDSCAPING AND TOPSOIL	SQ.YD.	0	\$ 17.00	0
	UTILITY RELOCATION	L.SUM	0	\$ 50,000.00	0
	<b>TOTAL ITEM 800</b>				<b>0</b>
	<b>INCIDENTALS</b>				
	CURB & GUTTER	L.FT.	8,000	\$ 30.00	240,000
	SIDEWALK	SQ.YD.	2,670	\$ 90.00	240,300
	<b>TOTAL ITEM 900</b>				<b>480,300</b>
	<b>SUBTOTAL A (ITEM SUBTOTAL)</b>				<b>\$1,400,600</b>
<b>PW</b>	<b>PROJECT WIDE</b>				
	TRAFFIC CONTROL (2% OF SUBTOTAL A)			2.0%	28,000
	QUALITY CONTROL (1% OF SUBTOTAL A)			1.0%	14,000
	CONSTRUCTION SURVEYING (1.5% OF SUBTOTAL A)			1.5%	21,000
	EROSION CONTROL (1% OF SUBTOTAL A)			1.0%	14,000
	MOBILIZATION (8% OF SUBTOTAL A)			8.0%	112,000
	UNIDENTIFIED ITEMS (20% OF SUBTOTAL A)			20.0%	280,100
	<b>BASE YEAR CONSTRUCTION COST (EXCLUDING BELOW THE LINE ITEMS, UTILITIES &amp; R/W)</b>				<b>\$1,869,700</b>
<b>INFL</b>	<b>BELOW THE LINE ITEMS</b>				
	POST DESIGN SERVICES (1% OF BASE YEAR CONSTRUCTION COST)			1.0%	18,700
	CONSTRUCTION CONTINGENCIES (5% OF BASE YEAR CONSTRUCTION COST)			5.0%	93,500
	CONSTRUCTION ENGINEERING (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	149,600
	<b>TOTAL ESTIMATED CONSTRUCTION COST (EXCLUDING UTILITIES &amp; R/W)</b>				<b>\$2,131,500</b>
<b>DES</b>	<b>PREDESIGN AND FINAL DESIGN</b>				
	PREDESIGN/NEPA/PI SERVICES (3% OF BASE YEAR CONSTRUCTION COST)			3.0%	56,100
	FINAL DESIGN SERVICES (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	149,600
	<b>TOTAL ESTIMATED DESIGN COST</b>				<b>\$205,700</b>
<b>R/W</b>	<b>RIGHT-OF-WAY</b>				
	RIGHT-OF-WAY	ACRES	6.63	\$ 250,000.00	1,657,500
	<b>TOTAL ESTIMATED RIGHT-OF-WAY COSTS</b>				<b>\$1,657,500</b>
	<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$3,995,000</b>

## MARICOPA ASSOCIATION OF GOVERNMENTS PLANNING-LEVEL COST ESTIMATE SUMMARY - Intersection with Dual Left-Turn Lanes

PROJECT NAME:		PROJECT DESCRIPTION: New Arterial			
ROUTE:		ESTIMATE LEVEL: Concept			
PROJECT LIMITS:		BASE YEAR: FY 2022			
LENGTH:		DATE: 6/30/2022			
ITEM	MAJOR ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST
	<b>EARTHWORK</b>				
	CLEARING & REMOVALS	ACRE	4.47	\$ 2,500.00	11,175
	ROADWAY EXCAVATION	CU.YD.	1,573	\$ 13.00	20,450
	BORROW	CU.YD.	1,573	\$ 17.00	26,740
	SUBGRADE TREATMENT	SQ.YD.	9,441	\$ 17.00	160,500
	FURNISH WATER	L.SUM	1	\$ 5,000.00	5,000
	<b>TOTAL ITEM 200</b>				<b>223,865</b>
	<b>BASE AND SURFACE TREATMENT</b>				
	AGGREGATE BASE	SQ.YD.	10,041	\$ 9.00	90,370
	ASPHALT PAVEMENT	SQ.YD.	23,050	\$ 36.00	829,800
	ARAC SURFACE	SQ.YD.	0	\$ 8.00	0
	<b>TOTAL ITEM 300 &amp; 400</b>				<b>920,170</b>
	<b>DRAINAGE</b>				
	DRAINAGE SYSTEM (CLOSED)	L.FT.	0	\$ 250.00	0
	DRAINAGE SYSTEM (CONVEYANCE CHANNEL)	L.FT.	0	\$ 477.00	0
	PIPE CULVERTS	L.FT.	0	\$ 460.00	0
	<b>TOTAL ITEM 500</b>				<b>0</b>
	<b>STRUCTURES</b>				
	BEARDSLEY CANAL BRIDGE	SQ.FT.	0	\$ 219.00	0
	BOX CULVERT	L.FT./CELL	0	\$ 1,712.00	0
	<b>TOTAL ITEM 600</b>				<b>0</b>
	<b>TRAFFIC ENGINEERING</b>				
	SIGNING (STREET)	MILE	0.00	\$ 97,000.00	0
	PAVEMENT MARKING	LANE-MILE	0.00	\$ 4,600.00	0
	LIGHTING	MILE	0.00	\$ 500,000.00	0
	TRAFFIC SIGNAL	EACH	0	\$ 400,000.00	0
	<b>TOTAL ITEM 700</b>				<b>0</b>
	<b>ROADSIDE DEVELOPMENT</b>				
	LANDSCAPING AND TOPSOIL	SQ.YD.	0	\$ 17.00	0
	UTILITY RELOCATION	L.SUM	0	\$ 50,000.00	0
	<b>TOTAL ITEM 800</b>				<b>0</b>
	<b>INCIDENTALS</b>				
	CURB & GUTTER	L.FT.	8,000	\$ 30.00	240,000
	SIDEWALK	SQ.YD.	2,670	\$ 90.00	240,300
	<b>TOTAL ITEM 900</b>				<b>480,300</b>
	<b>SUBTOTAL A (ITEM SUBTOTAL)</b>				<b>\$1,624,300</b>
<b>PW</b>	<b>PROJECT WIDE</b>				
	TRAFFIC CONTROL (2% OF SUBTOTAL A)			2.0%	32,500
	QUALITY CONTROL (1% OF SUBTOTAL A)			1.0%	16,200
	CONSTRUCTION SURVEYING (1.5% OF SUBTOTAL A)			1.5%	24,400
	EROSION CONTROL (1% OF SUBTOTAL A)			1.0%	16,200
	MOBILIZATION (8% OF SUBTOTAL A)			8.0%	129,900
	UNIDENTIFIED ITEMS (20% OF SUBTOTAL A)			20.0%	324,900
	<b>BASE YEAR CONSTRUCTION COST (EXCLUDING BELOW THE LINE ITEMS, UTILITIES &amp; R/W)</b>				<b>\$2,168,400</b>
<b>INFL</b>	<b>BELOW THE LINE ITEMS</b>				
	POST DESIGN SERVICES (1% OF BASE YEAR CONSTRUCTION COST)			1.0%	21,700
	CONSTRUCTION CONTINGENCIES (5% OF BASE YEAR CONSTRUCTION COST)			5.0%	108,400
	CONSTRUCTION ENGINEERING (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	173,500
	<b>TOTAL ESTIMATED CONSTRUCTION COST (EXCLUDING UTILITIES &amp; R/W)</b>				<b>\$2,472,000</b>
<b>DES</b>	<b>PREDESIGN AND FINAL DESIGN</b>				
	PREDESIGN/NEPA/PI SERVICES (3% OF BASE YEAR CONSTRUCTION COST)			3.0%	65,100
	FINAL DESIGN SERVICES (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	173,500
	<b>TOTAL ESTIMATED DESIGN COST</b>				<b>\$238,600</b>
<b>R/W</b>	<b>RIGHT-OF-WAY</b>				
	RIGHT-OF-WAY	ACRES	7.16	\$ 250,000.00	1,790,000
	<b>TOTAL ESTIMATED RIGHT-OF-WAY COSTS</b>				<b>\$1,790,000</b>
	<b>TOTAL ESTIMATED PROJECT COST</b>				<b>\$4,501,000</b>



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

## 6. Conclusions, Implementation and Next Steps

Alternative 1 appears to be the most favorable alignment for the section of El Mirage Road between SR 303L and Happy Valley Road based on the screening and evaluation of alternatives described in Chapter 5. This alignment should be considered for further study. For the section of El Mirage Road between Happy Valley Road and Jomax Road, a hybrid of Variations 1 and 3 appears to be the most favorable and is recommended for further study.

The project team recommends that El Mirage Road and Happy Valley Road Intersection Alternative 1 be included in further studies of El Mirage Road, along with the Intersection Alternative 1 at El Mirage Road and Jomax Road. As part of further study, local agencies should evaluate intersection conditions and mitigate at the time of need.

### 6.1 Implementation

Figure 3-2 (on Page 11) displays the ultimate typical section of El Mirage Road. The project team recommends El Mirage Road be developed over time to reach the ultimate six-lane principal arterial with a center median in conformance with MCDOT standards, and in coordination with the City of Peoria. Based on the results of the traffic analysis discussed in this Feasibility Report, through the 2040 horizon year, El Mirage Road will operate at an acceptable LOS as a four-lane principal arterial (two lanes in each direction of travel). Construction of the four-lane facility should begin with the inside two lanes in each direction of travel, a raised median, curb and gutter, bicycle lanes, and offset sidewalks set back to the ultimate location. Beyond 2040, the third lane in each direction of travel may be needed and should be constructed by widening to the outside.

There is a growing need for a continuous connection between SR 303L and Jomax Road to provide better access and relieve some of the congestion within the study area. This could initially consist of a single lane in each direction, as shown in Figure 6-1 and Figure 6-2, to fill in the gaps between SR and Jomax Road. The interim two-lane facility could be implemented over time as funding allows. If constructed at one time, it is estimated to cost approximately \$27,434,000 in 2022 dollars (shown at right) and would include the half-street ROW and the full bridge width at the Beardsley Canal due to pavement transitions and turn lanes at the El Mirage Road and Jomax Road intersection.

If funding constraints do not allow for a continuous two-lane facility from SR 303L to Jomax Road right now, other potential options for phased implementation of a continuous facility could include:

- Construction of the segment from West Desert Sun Lane to Jomax Road, including the Beardsley Canal bridge. This would provide a continuous roadway from Happy Valley Road to Jomax Road.
- Construction of a portion of the segment from SR 303L to Happy Valley Road

As development occurs in the study area the local jurisdiction could negotiate with the developers to build some, or all, of the ultimate street cross section adjacent to their developments, consistent with the developer traffic studies, as well as contributing to filling in the "gaps." However, there may be areas within the project limits that need to be programmed without private contributions to complete the full roadway and drainage improvements. As parcels adjacent to El Mirage Road begin to develop, turn lanes can be constructed into the medians for left turning vehicles or into curb and gutter for right turning vehicles as needed. Once traffic volumes begin to approach the threshold for a six-lane arterial, El Mirage Road can be completed to its ultimate cross section.

## MARICOPA ASSOCIATION OF GOVERNMENTS PLANNING-LEVEL COST ESTIMATE SUMMARY - INTERIM TWO-LANE ROADWAY

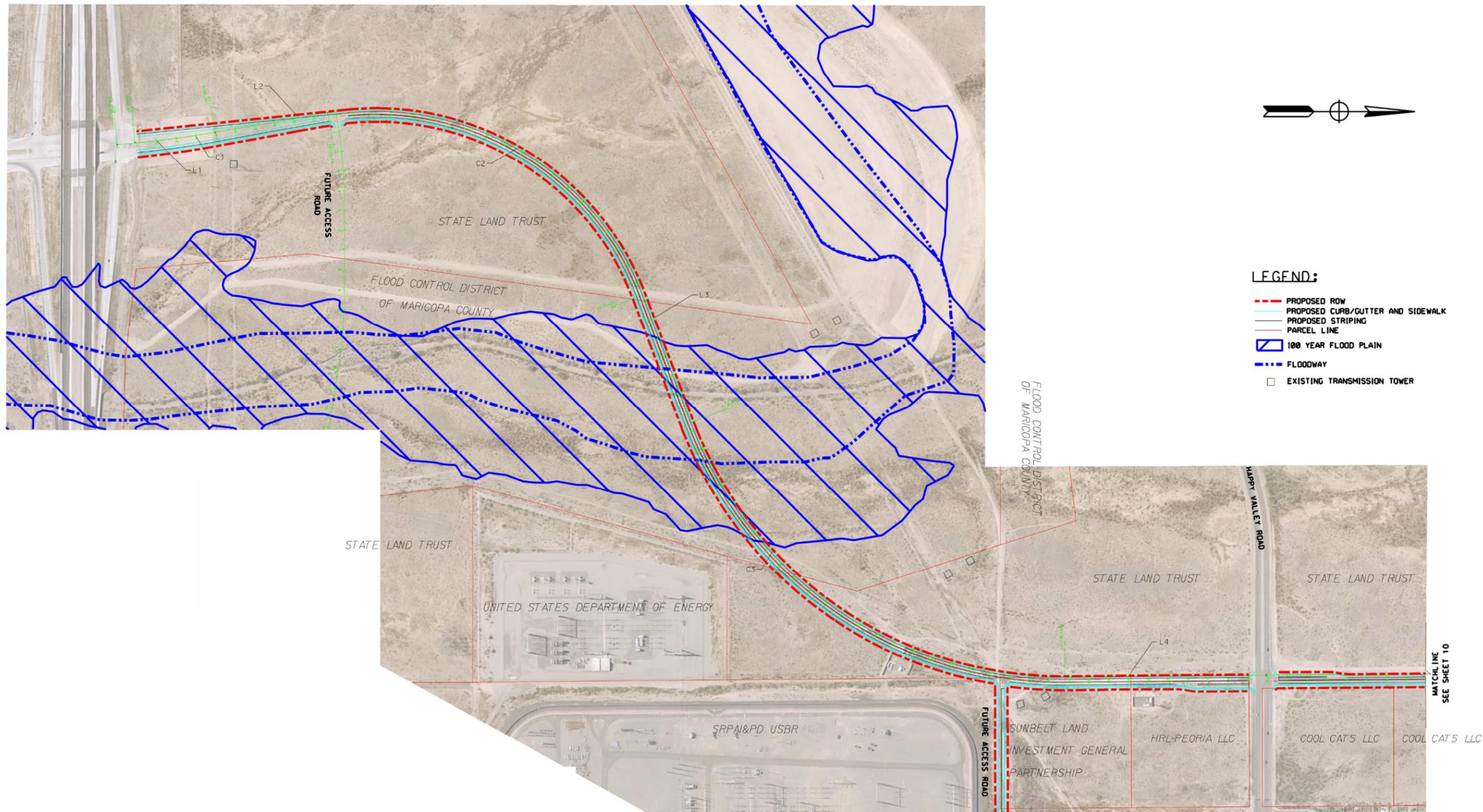
PROJECT NAME:		Feasibility Study		PROJECT DESCRIPTION:		New Half-Street	
ROUTE:		El Mirage Road		ESTIMATE LEVEL:		Concept	
PROJECT LIMITS:		SR-303L to Jomax Road		BASE YEAR:		FY 2022	
LENGTH:		2.29 Miles		DATE:		6/30/2022	
ITEM	MAJOR ITEM DESCRIPTION	UNIT	QUANTITY	UNIT COST	TOTAL COST		
<b>EARTHWORK</b>							
	CLEARING & REMOVALS	ACRE	14.40	\$ 2,500.00	36,000		
	ROADWAY EXCAVATION	CU.YD.	4,681	\$ 13.00	60,850		
	BORROW	CU.YD.	7,470	\$ 17.00	126,990		
	SUBGRADE TREATMENT	SQ.YD.	38,900	\$ 17.00	661,300		
	FURNISH WATER	L.SUM	1	\$ 15,000.00	15,000		
<b>TOTAL ITEM 200</b>					<b>900,140</b>		
<b>BASE AND SURFACE TREATMENT</b>							
	AGGREGATE BASE	SQ.YD.	38,900	\$ 9.00	350,100		
	ASPHALT PAVEMENT	SQ.YD.	38,900	\$ 36.00	1,400,400		
	ARAC SURFACE	SQ.YD.	0	\$ 8.00	0		
<b>TOTAL ITEM 300 &amp; 400</b>					<b>1,750,500</b>		
<b>DRAINAGE</b>							
	DRAINAGE SYSTEM (CLOSED)	L.FT.	8,000	\$ 250.00	2,000,000		
	DRAINAGE SYSTEM (CONVEYANCE CHANNEL)	L.FT.	1,900	\$ 477.00	906,300		
	PIPE CULVERTS	L.FT.	350	\$ 460.00	161,000		
<b>TOTAL ITEM 500</b>					<b>3,067,300</b>		
<b>STRUCTURES</b>							
	BEARDSLEY CANAL BRIDGE	SQ.FT.	16,800	\$ 219.00	3,679,200		
	BOX CULVERT	L.FT./CELL	375	\$ 1,712.00	642,000		
<b>TOTAL ITEM 600</b>					<b>4,321,200</b>		
<b>TRAFFIC ENGINEERING</b>							
	SIGNING (STREET)	MILE	2.18	\$ 97,000.00	211,460		
	PAVEMENT MARKING	LANE-MILE	2.18	\$ 4,600.00	10,030		
	LIGHTING	MILE	1.15	\$ 500,000.00	572,500		
	TRAFFIC SIGNAL	EACH	3	\$ 400,000.00	1,200,000		
<b>TOTAL ITEM 700</b>					<b>1,993,990</b>		
<b>ROADSIDE DEVELOPMENT</b>							
	LANDSCAPING AND TOPSOIL	SQ.YD.	10,309	\$ 17.00	175,250		
	UTILITY RELOCATION	L.SUM	1	\$ 50,000.00	50,000		
<b>TOTAL ITEM 800</b>					<b>225,250</b>		
<b>INCIDENTALS</b>							
	CURB & GUTTER	L.FT.	24,800	\$ 30.00	744,000		
	SIDEWALK	SQ.YD.	6,568	\$ 90.00	591,120		
<b>TOTAL ITEM 900</b>					<b>1,335,120</b>		
<b>SUBTOTAL A (ITEMS SUBTOTAL)</b>					<b>\$13,593,500</b>		
<b>PW</b>	<b>PROJECT WIDE</b>						
	TRAFFIC CONTROL (2% OF SUBTOTAL A)			2.0%	271,900		
	QUALITY CONTROL (1% OF SUBTOTAL A)			1.0%	135,900		
	CONSTRUCTION SURVEYING (1.5% OF SUBTOTAL A)			1.5%	203,900		
	EROSION CONTROL (1% OF SUBTOTAL A)			1.0%	135,900		
	MOBILIZATION (8% OF SUBTOTAL A)			8.0%	1,087,500		
	UNIDENTIFIED ITEMS (20% OF SUBTOTAL A)			20.0%	2,718,700		
<b>BASE YEAR CONSTRUCTION COST (EXCLUDING BELOW THE LINE ITEMS, UTILITIES &amp; R/W)</b>					<b>\$18,147,300</b>		
<b>INFL</b>	<b>BELOW THE LINE ITEMS</b>						
	POST DESIGN SERVICES (1% OF BASE YEAR CONSTRUCTION COST)			1.0%	181,500		
	CONSTRUCTION CONTINGENCIES (5% OF BASE YEAR CONSTRUCTION COST)			5.0%	907,400		
	CONSTRUCTION ENGINEERING (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	1,451,800		
<b>TOTAL ESTIMATED CONSTRUCTION COST (EXCLUDING UTILITIES &amp; R/W)</b>					<b>\$20,688,000</b>		
<b>DES</b>	<b>PREDESIGN AND FINAL DESIGN</b>						
	PREDESIGN/NEPA/PI SERVICES (3% OF BASE YEAR CONSTRUCTION COST)			3.0%	544,400		
	FINAL DESIGN SERVICES (8% OF BASE YEAR CONSTRUCTION COST)			8.0%	1,451,800		
<b>TOTAL ESTIMATED DESIGN COST</b>					<b>\$1,996,200</b>		
<b>R/W</b>	<b>RIGHT-OF-WAY</b>						
	RIGHT-OF-WAY	ACRES	19	\$ 250,000.00	4,750,000		
<b>TOTAL ESTIMATED RIGHT-OF-WAY COSTS</b>					<b>\$4,750,000</b>		
<b>TOTAL ESTIMATED PROJECT COST</b>					<b>\$27,434,000</b>		



# El Mirage Road

SR 303L to Jomax Road Feasibility Study

Figure 6-1: El Mirage Road from SR 303L to Happy Valley Road – Interim Two-Lane Facility

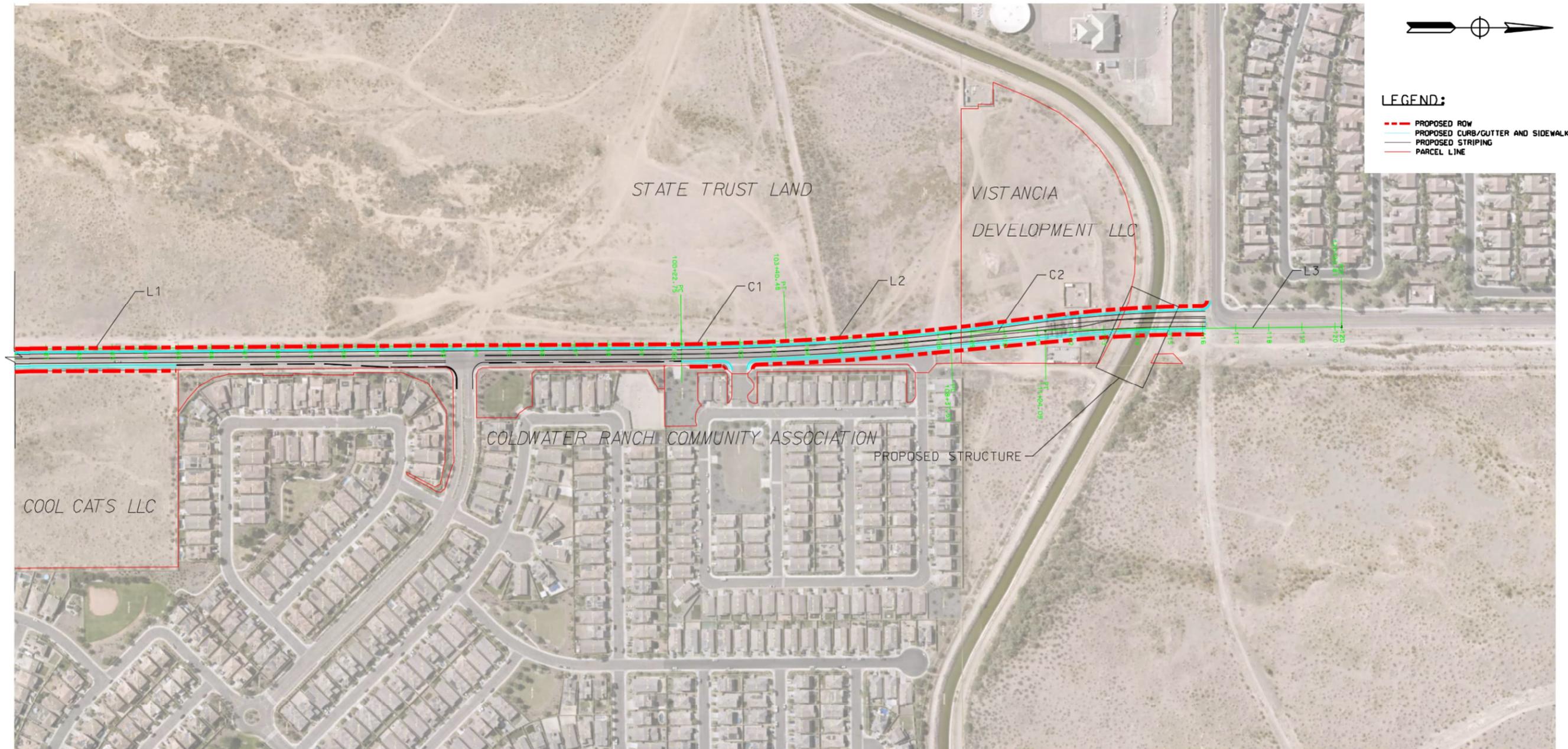




# El Mirage Road

SR 303L to Jomax Road Feasibility Study

Figure 6-2: El Mirage Road from Happy Valley Road to Jomax Road - Interim Two-Lane Facility





## El Mirage Road

SR 303L to Jomax Road Feasibility Study

### 6.2 Next Steps

This feasibility study provides an initial assessment of a future roadway alignment of El Mirage Road from SR 303L to Jomax Road, along with intersection configurations at Happy Valley Road and Jomax Road. An engineering design study is recommended as part of the next steps in the development process. This would involve further investigation of the topics and criteria that are discussed within this study. The following are some considerations that should be included during the next phases of development:

- Establish jurisdictional ownership and maintenance of the corridor responsibilities to establish final design criteria, typical section, and right-of-way requirements.
- Prepare a Design Concept Report (DCR) to further define the requirements of the corridor for future final design and construction.
- Program funding for the design concept, final design and construction phases.
- Coordinate property access needs with ASLD, MCDOT, and the City of Peoria.
- Coordinate access control requirements with ADOT near the El Mirage Road/SR 303L TI to meet the current ADOT Access Control Guidelines.
- Coordinate existing and future development plans with ASLD, MCDOT, the City of Peoria, and others to ensure compatibility with El Mirage Road. This should include discussion that the roadway improvements should not disproportionately impact any given landowner.
- Include provisions to accommodate the two trails crossing El Mirage Road within the project area: one along the Beardsley Canal and the McMicken trail south of Happy Valley Road, and a HAWK signal should be provided at the McMicken trail crossing.
- Coordinate with the Vistancia Bike club during future phases to better understand the needs and concerns of the active cycling community.
- Continue coordination with utility companies to understand potential impacts and maintenance access. Provisions for public utilities within the ROW corridor should be considered during future phases.
- Continue coordination of the Beardsley Canal crossing to ensure that maintenance access is provided.
- Assess the drainage requirements for the facilities and crossing washes and floodplains.
- Assess potential Impacts on the McMicken Wash and its floodplain, as well as FCDMC maintenance roads. Evaluate the need for a Conditional Letter of Map Revision/Letter of Map Revision or no rise certification during the design phase, including coordination with the floodplain manager and Federal Emergency Management Agency. The North Peoria Area Drainage Master Study is in development at the time of this feasibility report. This should be referred to for additional information in future phases.
- Coordinate with the FCDMC on the maintenance access requirements at the McMicken Outlet Channel.
- Consider noise mitigation near existing development during future project phases.
- Landscaping requirements should be evaluated during future phases.
- A noise study and potential noise mitigation may be required and should be evaluated during future phases of development.

If the future corridor is developed using the City of Peoria standard typical section shown in Figure 3-4, the project estimated cost would increase approximately \$2,190,000 to accommodate the additional 20 feet of right-of-way and 12' of public utility easement (6 feet on each side).

If federal funds are used for the implementation of any phase of this corridor, an environmental study compliant with the National Environmental Policy Act will be needed. Additionally, since much of the project corridor is within land managed by the ASLD, additional requirements may be necessary to comply with their policies, such as mineral rights and payments, plant salvage, and other requirements as necessary.