

# **FINAL FEASIBILITY REPORT and ENVIRONMENTAL OVERVIEW**

## **SR 69**

### **Prescott Lakes Pkwy to Frontier Village MP 293.8-294.8**



**ADOT Project No. 069 YV 293 H8739 01L  
Federal Project No. 069-A(217)T  
Cordes Junction – Prescott Highway**

**December 2015**

**Prepared for:  
Arizona Department of Transportation  
Intermodal Transportation Division  
Statewide Project Management Group**



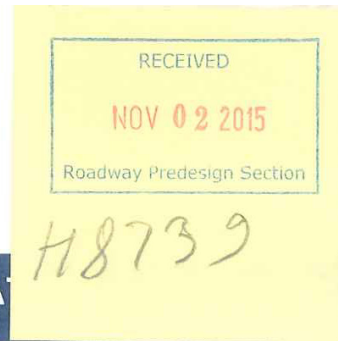
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*In Association with EcoPlan*







## PROJECT DETERMINATION

Project Number	County and ADOT District	Project Name and Highway
069 YV 293 H8739 01L	Yavapai County	SR 69, Prescott Lakes Pkwy to Frontier Village
069-A(217)T	Prescott District	Cordes Junction – Prescott Highway

Project Description:	Widen SR 69 from west of Prescott Lakes Pkwy at MP 293.8 to east of Yavpe Connector at MP 294.8.
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Existing Program	Program Year	Programmed Budget	Operating Partnership Category					
	TBD	--	S	F	T	D	Z	N/A
Yes	No	PA Construction Cost Estimate			X			
	X	\$6,727,000						

Public Hearing: In the Highway Development Process, at least one public hearing or the opportunity for a hearing will be offered for any project that:

<input type="checkbox"/>	Requires a significant amount of new right-of-way;	<input type="checkbox"/>	Otherwise has a significant social, economic, environmental or other effect
<input type="checkbox"/>	Substantially changes the layout or function of connecting roadway or the facility being improved;	<input type="checkbox"/>	Is controversial on environmental grounds;
<input type="checkbox"/>	Has a significant adverse impact on abutting real property;	<input type="checkbox"/>	Or has significant floodplain encroachment
		X	None of the above conditions apply

Recommends:

Yes:	No:	Environmental Category		
x		Public Forum	Class 1	Class II
	x	Offer a combined Location / Design Hearing		Class III
	x	Offer Separate Location/Design Hearing		X
	x	Hold a Design Public Hearing		

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Project Manager 614E  
Statewide Project Management Group  
Date 09/28/2015

Paul O'Brien  
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Date 9/28/15

Concur:  
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Prescott District Engineer, P800  
Date 10.26.15

Approved:  
Reed Henry  
Deputy Roadway Engineer 615E  
Date 11/16/15

Comments:  
Cost estimate needs to be revised. Should be close to \$100 million  
MODIFY ICAP P8. DRH





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# Executive Summary

The Arizona Department of Transportation (ADOT), in partnership with the Federal Highway Administration (FHWA), has initiated a feasibility study and environmental overview to evaluate proposed widening to SR 69 in Prescott, Arizona. ADOT Project No. 069 YV 293 H8739 01L [Federal Project Number 069-A(217)T] consists of a study to develop and evaluate widening concepts for the addition of one lane in each direction to State Route 69 (SR 69) from west of Prescott Lakes Parkway at milepost (MP) 293.8 to Frontier Village, east of the Yavpe Connector at MP 294.8. This project is located in Yavapai County and within ADOT's Prescott District.

This feasibility report was prepared to document the development and evaluation of widening considerations and the team's recommendations. Fifteen percent plans have been prepared for the recommended alternative, along with identification of right-of-way needs and utility relocations, and a preliminary construction cost estimate. The Environmental Overview is included in Chapter 5 of this report. The AASHTO Controlling Design Criteria Report is included in Appendix B. A Preliminary Drainage Report was prepared in December 2014.

The ADOT Environmental Planning Group Manager has indicated that based on the scope of work described in the Feasibility Report, the project does not qualify under (c)(22), (c)(23), or (c)(26) for a CE Checklist.

This project is not listed in the FY 2016-2020 ADOT Five-Year Transportation Facilities Construction Program.

Three widening alternatives and the No Build alternative were developed and evaluated for widening SR 69. Two additional alternatives for re-profiling a segment of SR 69 to accommodate a future City of Prescott intersection were developed but eliminated from further consideration when the City abandoned its plan for the new intersection. The recommended alternative is described below.

The **Recommended Alternative** consists of widening SR 69 to the north. SR 69 will consist of three lanes in each direction with a two-way left-turn lane and will include an eight-foot multi-use trail on the north side of SR 69. Approximately 1.5 acres of new right-of-way would be required.

An urban typical section is recommended, with 12-foot inside lanes, 14-foot outside lanes, and curb and gutter. The standard cross slope will be 0.020'/ft. in tangent sections. Superelevation rates for horizontal curves will match the existing superelevation.

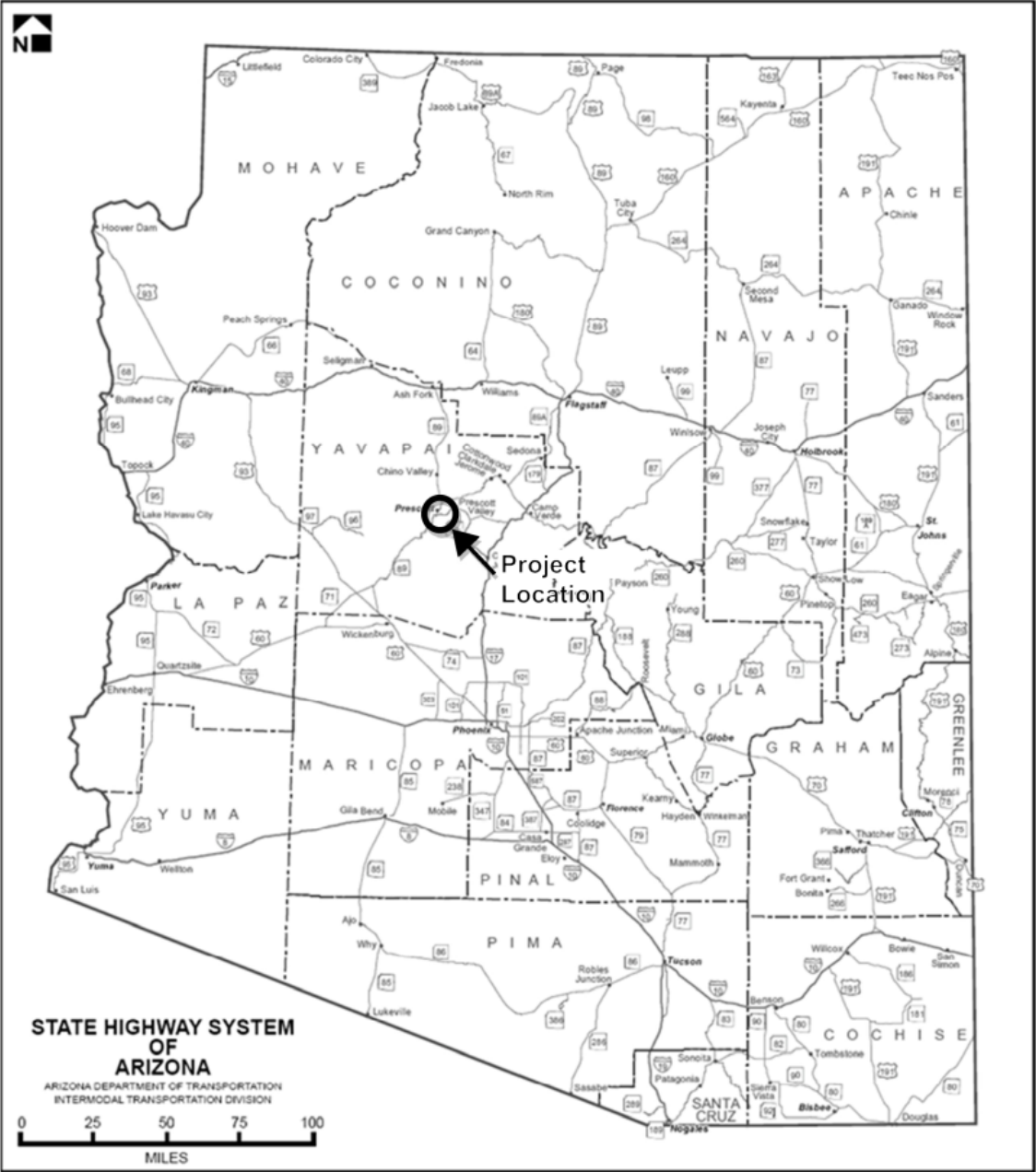
No changes to the existing horizontal or vertical alignments are anticipated.

SR 69 is not an access-controlled facility. Existing access points are allowed by permit from ADOT. Numerous driveways and two intersections exist within the study area. Four driveways and one intersection would be impacted with the recommended alternative.

The estimated cost for the SR 69 widening is \$6,819,000.



Figure 1– Vicinity Map



# 1.0 Introduction

## 1.1 Background

The Arizona Department of Transportation (ADOT), in partnership with the Federal Highway Administration (FHWA), has initiated a feasibility study and environmental overview to evaluate proposed widening to SR 69 in Prescott, Arizona. ADOT Project No. 069 YV 293 H8739 01L [Federal Project Number 069-A(217)T] consists of a study to develop and evaluate widening concepts for the addition of one lane in each direction to State Route 69 (SR 69) from west of Prescott Lakes Parkway at milepost (MP) 293.8 to Frontier Village, east of the Yavpe Connector at MP 294.8. This project is located in Yavapai County and within ADOT's Prescott District.

This project is not listed in the FY 2016-2020 ADOT Five-Year Transportation Facilities Construction Program.

The purpose of this project is to improve traffic operations. The SR 69 cross sections east and west of the project limits consist of six lanes. The four-lane cross section within the project limits creates a "bottleneck," which would be eliminated by widening SR 69 in the project area to six lanes.

State Route 69 connects Interstate 17 at Cordes Junction (MP 262.58) to the City of Prescott at the SR 69 junction with SR 89 at MP 296.25. The project area is bounded by Prescott Lakes Parkway on the east and the Yavpe Connector on the west. The study area is in rolling terrain.

Commercial development exists around the SR 69 intersection with Prescott Lakes Parkway; otherwise, the eastern segment of the project area is undeveloped. The western end of the project area is bordered by commercial development, including the large Frontier Village Center on the south side of SR 69. Adjacent land is owned by private parties, Arizona State Land Department, and the Yavapai-Prescott Indian Tribe.

The intersections on both ends of the project, Prescott Lakes Parkway and Yavpe Connector, are signalized. The SR 69 intersection with Holiday Drive is also signalized. Prescott Canyon Drive provides access to a residential area north of SR 69 and east of Yavpe Connector.

SR 69 runs east-west through the project area; however, because SR 69 in general is a south-north route, the stationing and milepost labeling increase from east to west. Hence, the study area will be described from east to west.

## 1.2 Description of Project

This feasibility report is being prepared to document the development and evaluation of widening considerations and the study team's recommendations. Fifteen percent plans have been prepared for the recommended alternative, along with identification of right-of-way needs and utility relocations, and a preliminary construction cost estimate. An Environmental Overview is included. Implementation of the study recommendations will depend on funding availability.

The SR 69 study area is located in the City of Prescott. Figure 1 shows a statewide vicinity map of the project area. Figure 2 (Page 2) illustrates the project area in its regional setting. Figure 3 (Page 2) reflects the SR 69 study area. Figure 4 (Page 5) shows a larger view of the study area.



Figure 2 – Regional Setting

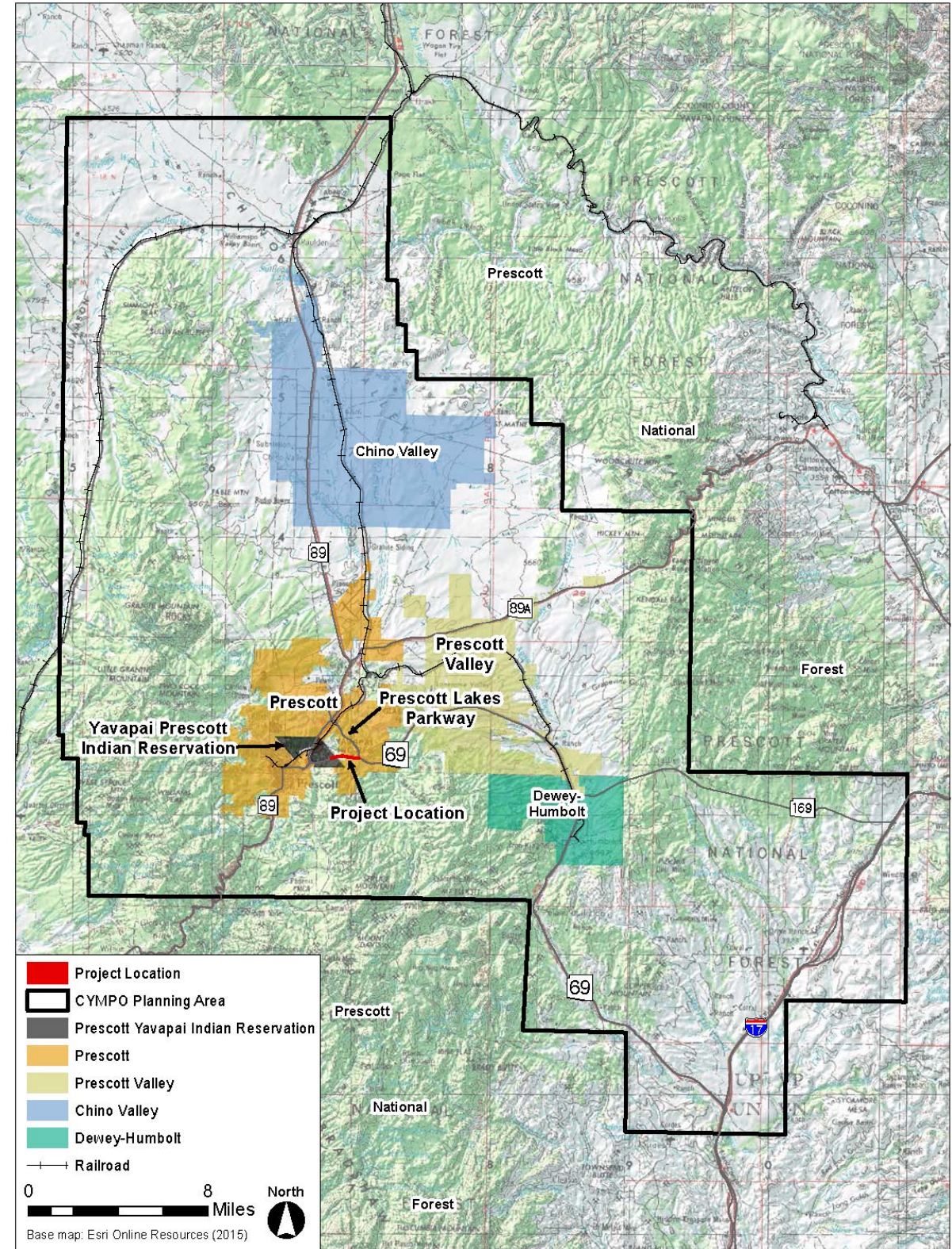
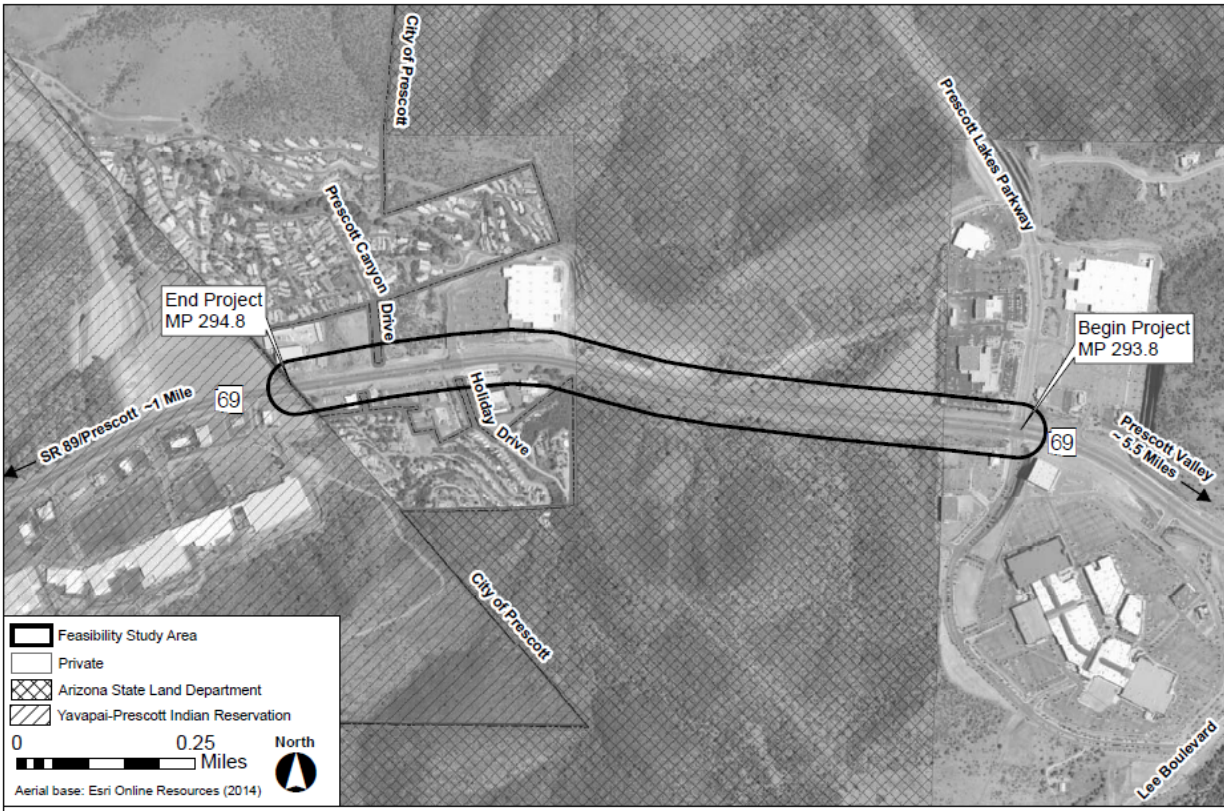


Figure 3 – Study Area



### 1.3 Project Objectives

The primary objectives of this report include evaluating widening alternatives for SR 69, describing the environmental issues associated with widening the roadway, and developing estimated construction costs associated with each alternative.

### 1.4 Existing Conditions

SR 69 is a principal arterial that serves regional needs and serves east-west traffic in Prescott.

#### 1.4.1 Land Use

Commercial development exists around the SR 69 intersection with Prescott Lakes Parkway; otherwise, the eastern half of the project area is undeveloped. The western end of the project area is bordered by commercial development, including a large home improvement store, restaurants, and a shopping center (Frontier Village).

Commercial development of the eastern segment of the project area is anticipated in the future.



1.4.2 Roadway Characteristics

The following projects were constructed within or adjacent to the project limits:

Table 1 – Record Drawings

PROJECT NUMBER	DATE	BEGIN MILEPOST	END MILEPOST	DESCRIPTION
S38(6)	1952	292.70	296.48	Bullwacker Pass - Prescott MBS
F-029-1(1)	1986	279.00	296.66	Overlay, guardrail
F-029-1(5)	1987	294.60	295.85	Pipe ext., turnouts, geometry, resurface
F-029-1(6)	1987	289.60	294.55	Realign, geom., widening (4-6 lanes), CBCs
STP-029-1(22)P	1995	292.80	296.10	Walker Rd - Jct 89 Mill & Repl AR and AC-FC
F-029-1-528	1999	294.66	294.74	Constr RT Lane @ Presc Cany Estates
Prescott Proj. D-11-1060	2001	293.31	293.80	Walker Rd to SR 69/SR 89 Connector Rd
AC-NH-069-A(1)P	2003	292.84	296.00	Mill & repl AC, AR-ACFC. Walker Rd-Heather Hts Dr
S-069-A-502	2003	294.54	294.54	SR 69 signal @ Holiday Dr., intersect. w/ Lowe's
S-069-A-510	2006	292.60	293.30	Walker Rd const.
HX109 01C	2008	294.28	294.68	Roadway widening, E. of Holiday Dr to Prescott Cyn Rd
Prescott Proj. 23764.9	2012	294.67	295.71	Connector Rd Phase IV

Roadway

The study area consists of rolling terrain with an average elevation of 5,500 feet.

SR 69 is functionally classified as a Principal Arterial. The posted speed limit is 45 miles per hour in both directions.

This segment of SR 69 is a four-lane urban highway. Right-turn lanes, left-turn lanes, and a two-way continuous left-turn lane exist throughout the project limits. One signalized intersection is located within the project limits, at Holiday Drive.

From MP 293.8 to MP 294.2, SR 69 has five 12-foot lanes and 8-foot shoulders. Where guardrail is present, there is an additional 2-foot shy distance. From MP 294.2 to MP 294.8, SR 69 has a five-lane section, turn lanes at some local developments, and concrete curb and gutter. The normal pavement cross slope is 2.0%.

There are seven right-turn lanes located at cross streets and business entrances. Curb and gutter exists on both sides of SR 69 from the west end of the project to Holiday Drive. The curb and gutter continues approximately 500 feet beyond Holiday Drive on the south side. The remaining portion of SR 69 is mostly bordered by guardrail. There are no sidewalks in the project area.

Many of the commercial properties in the western section of the project are accessed by steep driveways with existing grades between 10.5% and 19.0%.

Existing profile grades vary from 4.8% in the eastern section of the project to 1.2% in the western section. The profile descends from east to west, with the low point of the profile at the Yavpe Connector intersection.



Photo 1. Existing commercial driveway, looking southeast near Sta 4922+50.

Existing cross slope and superelevation rates range from 0.02’/ft to 0.067’/ft. Existing side slopes are steep in some areas – up to 1.5H:1V.

There are no transit stops or bus pullouts in the project limits.

1.4.3 Utilities

ADOT’s Prescott District Utility Permit Log and field observations indicate the presence of multiple underground and overhead utilities, both crossing and alongside SR 69.

The following table lists the major existing utilities which run parallel to and/or cross SR 69 within the study area.

Table 2 – Existing Utilities

COMPANY	FACILITY TYPE	STATION
ADOT	Storm drain, south side	4882+70 – 4887+35
	Storm drain, crossing	4902+90, 4935+10, 4944+35
	Culvert, crossing	4898+00, 4921+50, 4929+25
Arizona Public Service (APS)	Overhead electric, north side	4917+95 – 4928+65
	Overhead electric, crossing	4928+65, 4937+25, 4940+10
	Underground electric, south side	4939+35 – 4943+55
Cable One	Underground fiber optic, crossing	4928+65
	Underground fiber optic, south side	4928+65 – 4950+70
Calvary Chapel	Low pressure sewer, south side	4929+35 – 4935+40
Century Link	Underground cable, south side	Entire project length
	Underground cable, north side	4882+70 – 4888+25
		4925+20 – 4933+30
	Underground cable, crossing	4888+25, 4925+20, 4928+60
	Overhead cable, crossing	4937+25
	Underground fiber optic, south side	Entire project length
	Underground fiber optic, crossing	4928+65, 4950+30
	Overhead fiber optic, crossing	4939+50
	Underground fiber optic, north side	4939+50 – 4950+30
City of Prescott	Sewer, north side	4899+75 – 4929+35
	Sewer, crossing	4929+35
	Water, north side	4918+10 – 4934+05
	Water, south side	4927+85 – 4950+70
Holiday Hills Water District	Water, south side	4935+30
Prescott Coke	Water, crossing	4922+55
The Ranch at Prescott	Sewer, south side	4882+70 – 4899+75
	Sewer, crossing	4899+75
Unisource Energy	Gas, south side	4905+50 – 4917+40
		4922+85 – 4928+05
		4934+65 – 4943+20
		4917+40, 4934+65
	Gas, crossing	4917+40 – 4939+15
	Gas, north side	

There are no railroads near the study area.

1.4.4 Drainage

The study area lies in rolling terrain within the Upper Verde River Watershed. The only named drainage within the study area is Slaughterhouse Gulch, which has several unnamed smaller tributaries that drain the areas east and south of the study area. The tributaries of Slaughterhouse Gulch are conveyed under SR 69 through concrete box culverts near MP 294.1, under the Lowe’s parking lot, and just west of the Holiday Drive intersection.

Existing Drainage Conditions and Facilities

Existing drainage facilities along SR 69 consist of reinforced concrete box culverts, catch basins, closed storm drains, scuppers, roadside ditches, and area inlets.

In the eastern half of the project area (from Lowe’s east to Prescott Lakes Parkway), offsite flows drain toward SR 69 from both the north and south. West of Lowe’s to Frontier Village, offsite flows originate from the south and drain north toward SR 69.

Existing cross culverts within the project limits include 1-10’ x 8’ RCBC approximately 0.3 mile west of Prescott Lakes Parkway, 1-6’ x 7’ RCBC approximately 700 feet east of the Holiday Drive intersection, and 2-8’ x 7’ RCBC on the west side of the Holiday Drive intersection.

A listing of the large box culverts is shown in Table 3 (source: topographic mapping and record drawings).

Table 3 – Existing Drainage Facilities

EXISTING MAJOR DRAINAGE PIPES AND CULVERTS		
STATION	SIZE	LENGTH (ft)
4898+00 (East)	1-10’x8’ RCBC	234.25
4921+42 (Central)	1-6’x7’ RCBC	180.44
4929+27 (West)	2-8’x7’ RCBC	147.62

RCBC = reinforced concrete box culvert



Figure 4 – SR 69 Study Area





1.4.5 Right-of-Way

Right-of-way (R/W) widths vary from 250 feet to 300 feet in the eastern section of the project. From approximately the project midpoint to the west end, the existing R/W width is 200 feet. Adjacent land is owned by private parties, the Arizona State Land Department (ASLD), and the Yavapai-Prescott Indian Tribe. Land ownership is shown in Figure 5. SR 69 is located on ADOT-owned R/W adjacent to private lands and is on easements from ASLD and the Yavapai-Prescott Indian Tribe elsewhere.

Figure 5 – Study Area Land Ownership

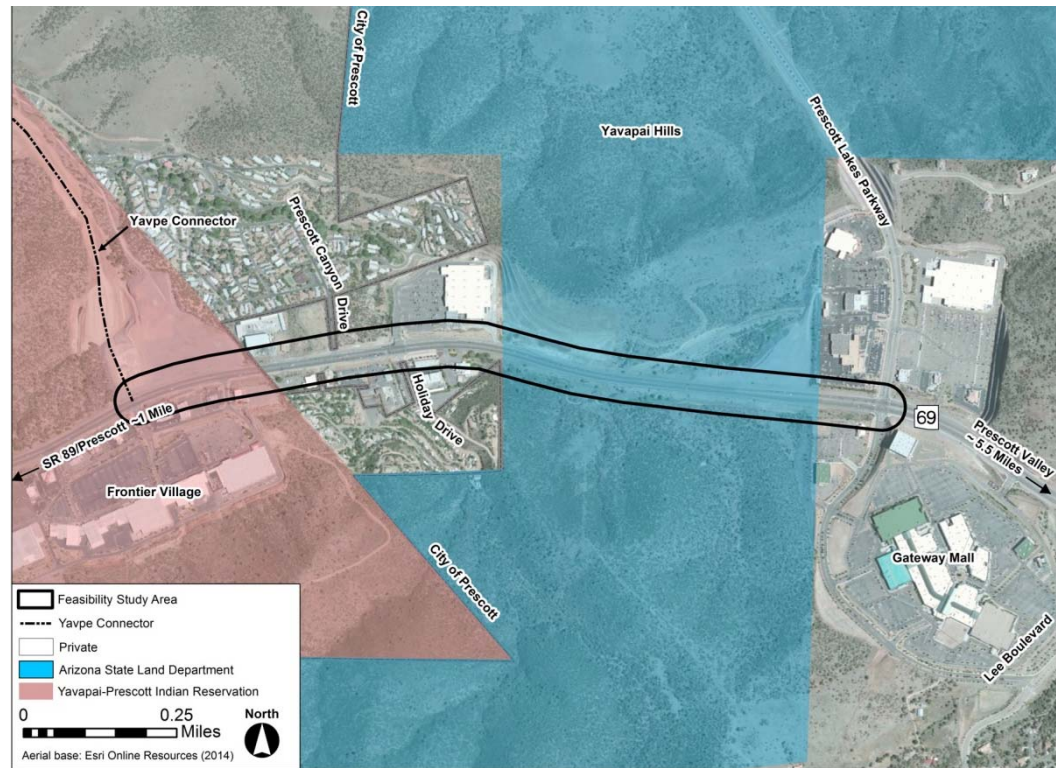


Photo 2. Existing SR 69, looking northwest.

1.4.6 Existing Structures

According to the ADOT Bridge Log, there are no existing structures within the project limits.

## 2.0 Traffic Data

### 2.1 Background

The existing posted speed limit within the study section is 45 MPH.

### 2.2 Existing Traffic Volumes

As reported by ADOT’s Multimodal Planning Division website, the estimated Annual Average Daily Traffic (AADT) and traffic factors (K, D and T) in the vicinity of the project are shown in Table 4. The 2014 ADT was derived from traffic count data obtained by ADOT over a two-week period in October and November, 2014.

ADOT shows the current average daily traffic from Prescott Lakes Parkway to Frontier Village, MP 293.8 to MP 294.8, as 36,739 vehicles per day. This is a 2014 count with a K factor of 9, a D factor of 60, and a T factor of 12. Based on the count data in 2014, there are 3,307 vehicles per hour in the peak hour, with 1,984 vehicles per hour in the peak direction and 1,323 vehicles per hour in the off-peak direction.

### 2.3 Forecast Traffic Volumes

Population in the city of Prescott is projected to grow by 90% between 2010 and 2040, according to the draft CYMPO Regional Transportation Plan Update 2040. The employment growth projection for the same period is 140%.

#### 2.3.1 2030 Forecast Traffic Volumes

The 2030 forecast for this segment of SR 69 is 58,044 vehicles per day based on an average annual growth rate of 1.029%. The 2030 volumes, using the same K and D factors, equates to 3,134 vehicles per hour in the peak direction and 2,090 vehicles per hour in the off-peak direction.

#### 2.3.2 2040 Forecast Traffic Volumes

The same growth rate was used to forecast 2040 volumes. The 2040 projected ADT is 77,251 vehicles per day with a peak hour volume of 6,953 vehicles per hour. This is 4,172 vehicles per hour in the peak direction and 2,781 vehicles per hour in the off-peak direction.

The 2030 and 2040 projected AADT were calculated by annually compound the 2014 traffic count by an average annual growth rate of 1.029%. Table 4 shows the design factors, existing AADT, and projected AADT.

Table 4 – SR 69 Traffic Data

LOCATION (MP)		TRAFFIC COUNTER SYSTEM	SEGMENT DESCRIPTION (START – END)	DESIGN FACTORS (%) 2011			AADT	PROJECTED AADT *	PROJECTED AADT *
BEGIN	END	MP		K	D	T	2014	2030	2040
293.8	294.8	294.7	MP 293.76 – MP 295.40	9	60	12	36,739 (3,307 Pk)	58,044 (5,224 Pk)	77,251 (6,953 Pk)

## 2.4 Traffic Conditions

### 2.4.1 Performance Criteria

The concepts of quality and level of service are defined in the Highway Capacity Manual (HCM) 2010 published by the Transportation Research Board. Quality of service is a qualitative measure to characterize operational conditions within a traffic stream. Level of service (LOS) is a qualitative measure describing operational conditions of a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Letters designate each level from A to F, with A representing the best operating conditions and F the worse. The quality measure used to provide an estimate of multi-lane highway LOS is density expressed in terms of the number of equivalent passenger cars per lane per mile (pc/ln/mi). Table 5 provides the LOS criteria for multi-lane highways analysis.

Table 5 – Multi-Lane Highway LOS Density Ranges

LOS	HIGHWAY MAINLINE DENSITY (pc/mi/ln)
A	≥11
B	>11-18
C	>18-26
D	>26-35
E	>35-45
F	>45

Source: HCM 2010 Chapter 14 and Exhibit 14-4, Transportation Research Board

Design LOS and capacity goals for Arizona state roadways are described in the *Roadway Design Guidelines* (RDG) from the ADOT Roadway Engineering Group. The design LOS for various highway types as published in Table 103.2A of the RDG are shown in Table 6.

Table 6 – ADOT RDG Level of Service Criteria

CONTROLLED ACCESS HIGHWAY TYPE	DESIGN LOS
Level Terrain	B
Rural / Rolling Terrain	B
Mountainous Terrain	B-C
Urban / Fringe Urban Areas	C-D

### 2.4.2 Existing Level of Service

A level of service analysis was conducted using the HCS 2010 Software, Multi-Lane Highways application. This calculation resulted in a LOS D for the peak direction and LOS B for the off-peak direction. This is a roadway level of service; it is anticipated that the adjacent signalized intersections might operate at a worse level of service. Peak hour traffic and LOS for 2014 is summarized in Table 7.

**Table 7 – Existing (2014) LOS**

DIRECTION	2014 PEAK HOUR TRAFFIC	2 LANES	
		LOS	DENSITY (pc/mi/ln)
Peak Direction	3,307	D	26.2
Off-Peak Direction	1,984	B	17.5

**2.4.3 2030 Forecast LOS**

Based on the 2030 forecast traffic volumes, with two lanes in each direction, SR 69 would operate at LOS E for the peak direction and LOS D for the off-peak direction. Improving SR 69 to three lanes in each direction would result in LOS D for the peak direction and LOS C for the off-peak direction for year 2030. Peak hour traffic and LOS for 2030 are summarized in Table 8.

**Table 8 – 2030 Forecast LOS**

DIRECTION	DESIGN LOS	2030 PEAK HOUR TRAFFIC	2 LANES		3 LANES	
			LOS	DENSITY (pc/mi/ln)	LOS	DENSITY (pc/mi/ln)
Peak Direction	C - D	3,134	E	43.3	D	27.3
Off-Peak Direction	C - D	2,090	D	27.3	C	18.2

**2.4.4 2040 Forecast LOS**

As a two-lane highway, SR 69 would operate at LOS F in the peak direction and LOS E in the off-peak direction. As a three-lane highway, SR 69 would operate at LOS E in the peak direction and LOS C in the off-peak direction. The analyses were based on the 2040 forecast volumes. Peak hour traffic and LOS for 2040 is summarized in Table 9.

**Table 9 – 2040 Forecast LOS**

DIRECTION	DESIGN LOS	2040 PEAK HOUR TRAFFIC	2 LANES		3 LANES	
			LOS	DENSITY (pc/mi/ln)	LOS	DENSITY (pc/mi/ln)
Peak Direction	C - D	4,172	F	N/A*	E	37.2
Off-Peak Direction	C - D	2,781	E	37.2	C	24.2

\*HCS+ does not compute a density when LOS is F

**2.5 Crash Data**

Crash data was obtained from ADOT for SR 69 between Prescott Lakes Parkway and Yavpe Connector (Frontier Village). This crash data has been summarized in Tables 10 to 15.

Table 10 shows the number of crashes by the manner of collision. The data indicates that approximately 63% of crashes in the past five years have been rear end collisions. The least likely manners of collisions are sideswipe (opposite direction), head-on, and rear to side.

**Table 10 – SR 69, Crashes by Manner of Collision**

MANNER OF COLLISION	06/2009 TO 05/2010	06/2010 TO 05/2011	06/2011 TO 05/2012	06/2012 TO 05/2013	06/2013 TO 06/2014	5 YEAR TOTAL	YEARLY AVG TOTAL
Single Vehicle	9	4	7	9	13	42	8.4
Sideswipe (same direction)	5	10	15	10	18	58	11.6
Sideswipe (opposite direction)	0	0	0	2	0	2	0.4
Left Turn	5	8	4	15	10	42	8.4
Rear End	56	84	92	69	64	365	73
Head On	0	0	0	2	2	4	0.8
Rear to Side	0	0	0	0	2	2	0.4
Angle (front to side) (other than left turn)	12	11	10	9	13	55	11
Other	2	4	2	0	4	12	2.4
<b>Total</b>	<b>89</b>	<b>121</b>	<b>130</b>	<b>116</b>	<b>126</b>	<b>582</b>	<b>116.4</b>

Table 11 shows the number of crashes by severity. The data indicates that approximately 64% of crashes are property damage only and approximately 21% are possible injury only. For each year in the data collection period, approximately one fatal crash and three incapacitating crashes occur.

**Table 11 – SR 69, Crashes by Severity**

SEVERITY	06/2009 TO 05/2010	06/2010 TO 05/2011	06/2011 TO 05/2012	06/2012 TO 05/2013	06/2013 TO 06/2014	5 YEAR TOTAL	YEARLY AVG TOTAL
Fatal	0	0	0	2	2	4	0.8
Incapacitating Injury	0	6	2	6	0	14	2.8
Non-Incapacitating Injury	11	14	18	7	20	70	14
Possible Injury	21	20	35	33	11	120	24
Property Damage Only (No Injury)	57	81	75	68	93	374	74.8
<b>Total</b>	<b>89</b>	<b>121</b>	<b>130</b>	<b>116</b>	<b>126</b>	<b>582</b>	<b>116.4</b>



Table 12 shows the number of crashes by first harmful event. The data indicates that approximately 92% of the crashes occur with the first harmful event being the motor vehicle is in transport. The next likely first harmful event is a wild game animal with approximately 5%.

Table 12 – SR 69, Crashes by First Harmful Event

FIRST HARMFUL EVENT	06/2009 TO 05/2010	06/2010 TO 05/2011	06/2011 TO 05/2012	06/2012 TO 05/2013	06/2013 TO 06/2014	5 YEAR TOTAL	YEARLY AVG TOTAL
Motor Vehicle in Transport	80	115	123	107	113	538	107.6
Face of Guardrail	1	0	0	0	0	1	0.2
End of Guardrail	1	0	0	0	0	1	0.2
Traffic Sign Support	1	0	0	0	0	1	0.2
Impact Attenuator or Crash Cushion	0	0	0	1	0	1	0.2
Work Zone Maintenance Equipment	0	0	0	1	0	1	0.2
Other Fixed Object	1	0	0	0	1	2	0.4
Cargo Equipment Loss Shift	0	0	1	0	0	1	0.2
Struck by Falling or Shifting Cargo or Object	0	1	0	0	0	1	0.2
Other Non-Fixed Object	0	1	0	0	0	1	0.2
Ditch	0	0	0	0	1	1	0.2
Embankment	0	0	1	0	0	1	0.2
Pedestrian	0	2	0	0	0	2	0.4
Animal-Livestock	0	0	0	0	1	1	0.2
Animal-Wild Game	5	2	5	7	9	28	5.6
Animal-Wild Non-Game	0	0	0	0	1	1	0.2
Total	89	121	130	116	126	582	116.4

Table 13 shows the number of crashes by road surface condition. Approximately 90% of crashes occur when the road surface is dry while 7% occur when the road is wet.

Table 13 – SR 69, Crashes by Road Surface Condition

ROAD SURFACE CONDITION	06/2009 TO 05/2010	06/2010 TO 05/2011	06/2011 TO 05/2012	06/2012 TO 05/2013	06/2013 TO 06/2014	5 YEAR TOTAL	YEARLY AVG TOTAL
Dry	77	109	122	108	110	526	105.2
Wet	7	6	6	6	16	41	8.2
Ice or Frost	3	0	0	0	0	3	0.6
Snow	2	0	2	2	0	6	1.2
Unknown	0	6	0	0	0	6	1.2
Total	89	121	130	116	126	582	116.4

Table 14 shows the number of crashes by weather condition. Approximately 80% of crashes happen when the weather is clear while the next most common weather condition for accidents is cloudy with approximately 12%.

Table 14 – SR 69, Crashes by Weather Condition

WEATHER CONDITION	06/2009 TO 05/2010	06/2010 TO 05/2011	06/2011 TO 05/2012	06/2012 TO 05/2013	06/2013 TO 06/2014	5 YEAR TOTAL	YEARLY AVG TOTAL
Clear	76	90	112	93	97	468	93.6
Cloudy	5	20	14	19	14	72	14.4
Rain	3	5	0	2	13	23	4.6
Snow	5	0	4	2	2	13	2.6
Unknown	0	6	0	0	0	6	1.2
Total	89	121	130	116	126	582	116.4

Table 15 shows the number of crashes by daylight condition. Approximately 85% of crashes happened during daylight hours. Approximately 6.7% of the accidents occurred when it was dark but lighted and 5% when it was dark and not lighted.

Table 15 – SR 69, Crashes by Daylight Condition

DAYLIGHT CONDITION	06/2009 TO 05/2010	06/2010 TO 05/2011	06/2011 TO 05/2012	06/2012 TO 05/2013	06/2013 TO 06/2014	5 YEAR TOTAL	YEARLY AVG TOTAL
Daylight	69	111	111	97	106	494	98.8
Dark (lighted)	7	4	7	9	12	39	7.8
Dark (not lighted)	7	4	5	8	5	29	5.8
Dusk	6	2	3	2	3	16	3.2
Dawn	0	0	4	0	0	4	0.8
Total	89	121	130	116	126	582	116.4

# 3.0 Widening Alternatives

## 3.1 Introduction

Existing SR 69 through the project limits consists of two lanes in each direction and a two-way left-turn lane. Paved shoulders are present from Prescott Lakes Parkway west to approximately 500 feet east of Holiday Drive. From Holiday Drive to the west, curb and gutter is present on both sides of the roadway. In several locations, right-turn lanes have been developed through various projects. Beyond the project limits to the east and west, SR 69 consists of three lanes in each direction and a two-way left-turn lane. The goal of this study is to identify a recommended widening strategy for a six-lane cross section through the project limits.

## 3.2 No Build Alternative

In the no build alternative, the existing roadway would remain with two lanes in each direction and a two-way left-turn lane.

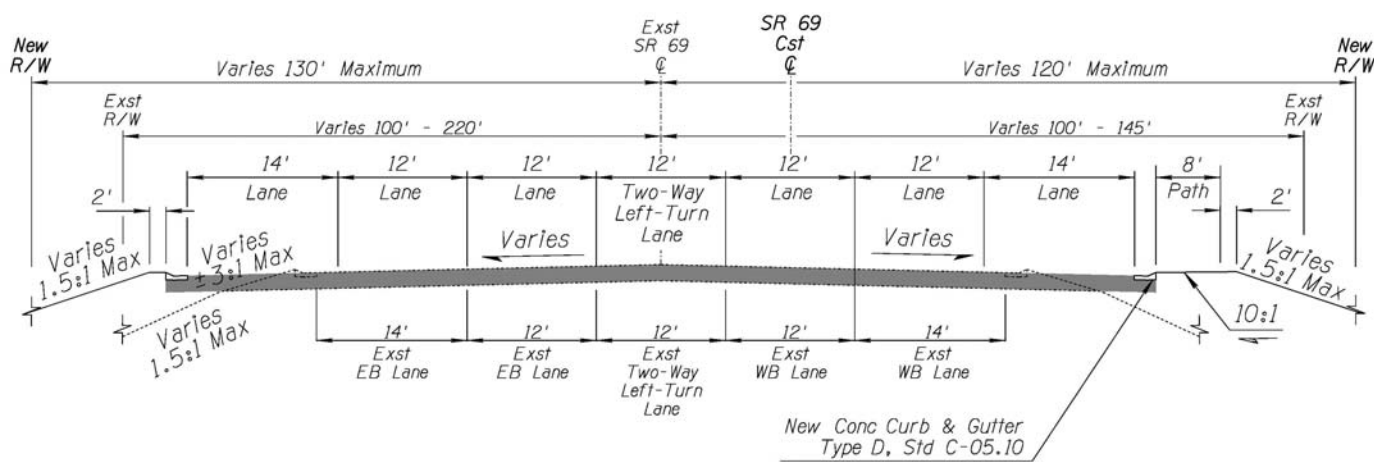
## 3.3 Build Alternatives

### 3.3.1 Widen SR 69 Symmetrically

There have been several minor improvements to SR 69 within the project limits, including turn lane additions for businesses which included surplus pavement width for use in the future. Widening symmetrically would allow the additional pavement to be utilized. A 14-foot outside lane and curb and gutter would be added to both sides of the roadway with an 8-foot multi-use path added on the north side of the roadway. Locating the path on the south side was also considered but the south side location was rejected due to several existing developments with steep driveways.

The existing pavement would be sawcut at the edge of traveled way and widened. The pavement structural section for the widening was assumed to be 7.5 inches of asphaltic concrete (AC) on 20 inches of aggregate base (AB) (Class 2) with ½ inch AR-ACFC. The typical section is shown in Figure 6.

Figure 6 – Widen Symmetrically Typical Section



In this alternative, the existing crown would remain in the center of the two-way left-turn lane and the existing cross slope would be matched throughout. Side slopes vary from 1.5:1 to 4:1 and would require 3800 feet of guardrail and 160 feet of 5-foot high retaining wall from Station 4934+35 to Station 4935+95. Because of the steep driveways to existing businesses on the south side of SR 69, the path is recommended on the north side. Even with the path on the north side, all driveways and side street intersections would need to be reconstructed. Existing driveway grades exceed 19% in areas and would be steepened with the proposed widening. The existing and proposed profiles for the west driveway to Audio Express near Station 4938+20 are shown on Figure 9 (Page 11). The Audio Express driveway is shown due to the high grades, existing and proposed, at this location. Temporary construction easements would be required at six of the driveways.

The approximate R/W required for this alternative would be 1.45 acres.

Utilities would be impacted with this widening. Major impacts include one pole associated with a fiber optic overhead crossing near Station 4939+50. Construction would also impact the wash running along the south side of SR 69 from Station 4891+00 to Station 4901+50 and the east culvert as proposed fill slopes would impede this wash. Retaining walls would likely be required in this area. Other impacts include storm drain inlets at Stations 4935+80 Rt, 4934+70 Lt, 4928+50 Lt, and 4927+40 Lt, and various minor impacts such as valve, manhole, and pedestal adjustments.

The southern two corners of the signalized intersection with Holiday Drive will be impacted as part of this alternative, including two signal poles, one pedestrian signal, and several pull boxes.

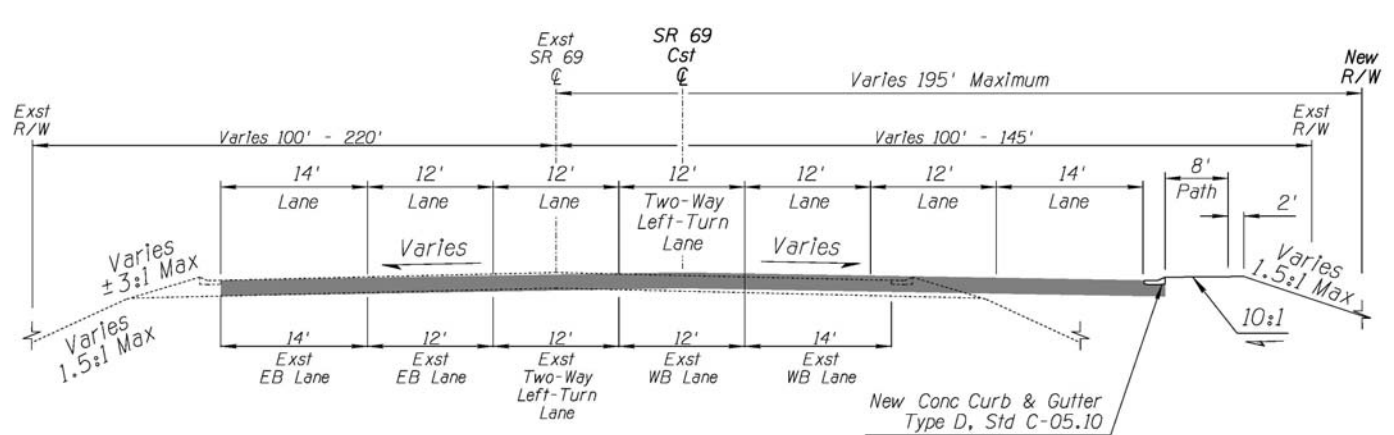
The estimated construction cost for the Widen Symmetrically Alternative is \$8,534,000.

### 3.3.2 Widen SR 69 to the North

With this alternative, pavement, curb and gutter, an eight-foot multi-use path, and guard rail would be added to the north side of SR 69. Widening to the north restricts construction to one side of the roadway, reducing impacts to traffic during construction; however, 96 square yards of existing pavement, Station 4939+00 to Station 4942+75, would not be utilized for the proposed roadway widening.

The existing pavement would be sawcut at the north edge of traveled way and widened. The pavement structural section for the widening was assumed to be 7.5 inches of AC on 20 inches of AB (Class 2) with ½ inch AR-ACFC. The typical section is shown in Figure 7.

Figure 7 – Widen to the North Typical Section



The existing pavement crown would be located in the center of the inside southbound lane. Pavement reconstruction, including differential milling, would be required to shift the crown location to the center of the two-way left-turn lane. The existing cross slope would be matched throughout. Side slopes vary from 1.5:1 to 4:1 and would require 3200 linear feet of guardrail. No retaining walls would be required.

Driveway and side street reconstruction would be required at five locations: U-Haul driveway (near Station 4938+75), Prescott Lakes Parkway, Holiday Drive, Lowe’s east entrance, and a pump station east of Lowe’s. Temporary construction easements would be required at two of the locations, U-Haul and Holiday Drive. Improvements would extend 35 feet beyond the existing right-of-way at U-Haul and 20 feet at Holiday Drive. All of the locations except the U-Haul driveway would be reconstructed using acceptable driveway grades. U-Haul has a current maximum grade of 10.9%; the grade would need to be increased to 11.6% to minimize impacts to the property beyond the driveway. All other reconstructed driveways have proposed grades of 6% or less. Driveway connections on the south side of SR 69 would not be affected.

The approximate R/W required for this alternative would be 1.5 acres.

Utilities would be impacted with this widening. Major impacts include a pole for the fiber optic overhead crossing near Station 4939+50. The wash on the south side of SR 69 west of Prescott Lakes Parkway would not be affected. Other impacts include storm drain outlets at Stations 4935+80 Rt and 4933+10 Rt, and various minor impacts such as valve and manhole adjustments (one CenturyLink manhole at Station 4933+10 Rt is located partially in the shared-use path).

The northern two corners of the signalized intersection with Holiday Drive will be impacted as part of this alternative, including one signal pole, two pedestrian signals, and several pull boxes. One 55-foot mast arm signal pole and one power pole are narrowly missed in this alternative; however, the contractor would need to use caution as these poles will be within four feet of proposed work areas.

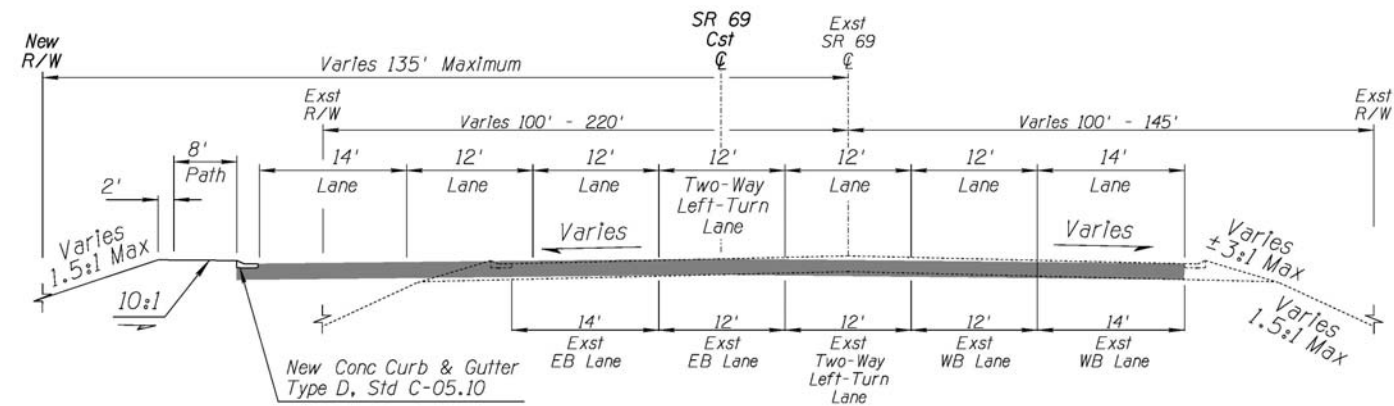
The estimated construction cost for the Widen to the North Alternative is \$6,819,000.

**3.3.3 Widen SR 69 to the South**

With this alternative, pavement, curb and gutter, an 8-foot multi-use path, and guard rail would be added to the south side of SR 69. Widening to the south restricts construction activities to one side of the roadway, reducing impacts to traffic during construction.

The existing pavement would be sawcut at the south edge of traveled way and widened. The pavement structural section for the widening was assumed to be 7.5 inches of AC on 20 inches of AB (Class 2) with ½ inch AR-ACFC. The typical section is shown in Figure 8.

**Figure 8 – Widen to the South Typical Section**



The existing crown would be located in the center of the inside northbound lane; shifting it to the middle of the center turn lane would require differential milling. The existing cross slope would be matched throughout. Side slopes vary from 1.5:1 to 4:1 and would require 3700 feet of guardrail and 160 feet of 10-foot high retaining wall from Station 4934+35 to Station 4935+95.

Driveway and side street reconstruction would be required at nine locations. In order to match the widened pavement, seven driveways would be reconstructed with grades steeper than the existing grades, which exceed 19% in areas. Temporary construction easements would be required at five of the driveways.

The approximate R/W required for this alternative would be 0.30 acres.

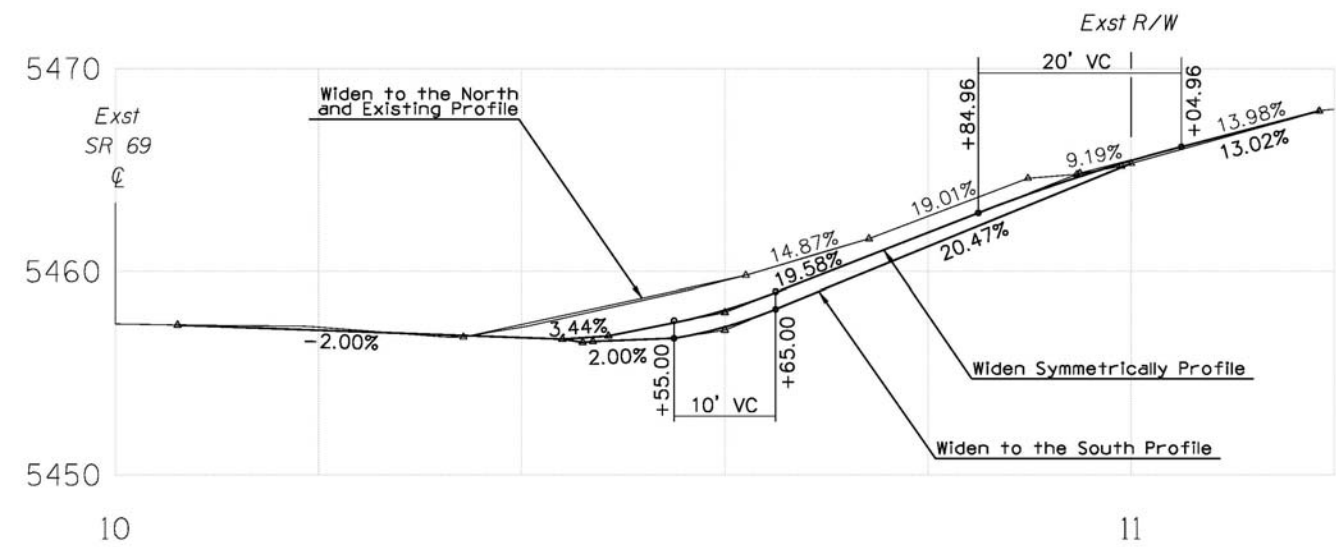
Utilities would be impacted with this widening. Major impacts include one pole associated with a fiber optic overhead crossing near Station 4939+50. Construction would also impact the wash running along the south side of SR 69 from Station 4891+00 to Station 4901+50 and the east culvert as proposed fill slopes would impede this wash; additional retaining walls in this area would likely required. Other impacts include storm drain inlets at Stations 4934+70 Lt and Station 4934+50 Lt, and various minor impacts such as valve and manhole adjustments.

The southern two corners of the signalized intersection with Holiday Drive would be impacted as part of this alternative, including two signal poles, one pedestrian signal, and several pull boxes.

The estimated construction cost for the Widen to the South Alternative is \$8,118,000.



Figure 9 – Audio Express (Sta. 4938+20) Driveway Profiles



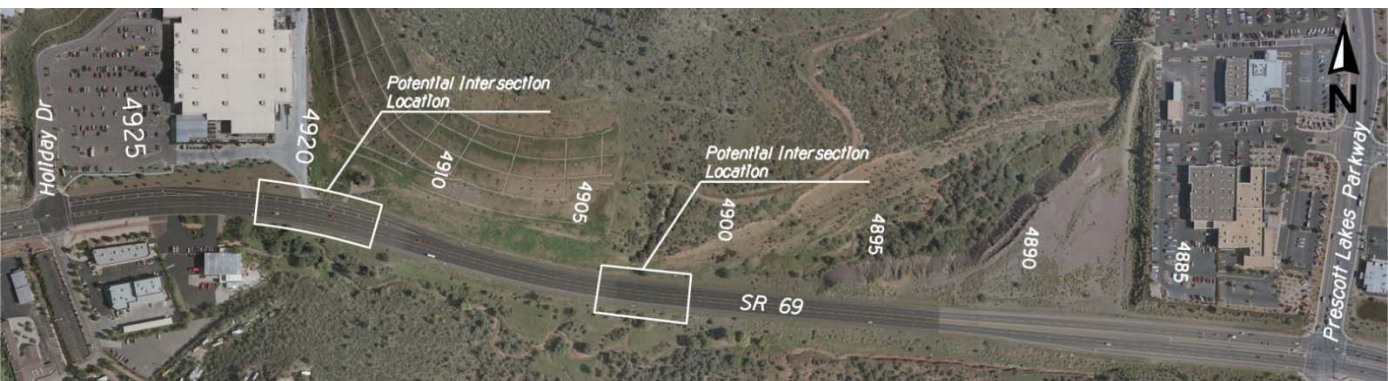
### 3.3.4 Widening with Future Intersection

The City of Prescott considered constructing a new arterial roadway that would intersect SR 69 between Prescott Lakes Parkway and Holiday Drive in the future. Two proposed intersection locations are shown conceptually in Figure 10. In order to provide a flatter area for the intersection, the existing roadway profile would need to be modified. Two modified profiles were developed, each creating a “platform” for a future intersection.

One sub-alternative proposed the intersection location near Station 4903+00, midway between Prescott Lakes Parkway and Holiday Drive. The existing profile grade of 4.8% would be modified to provide a flatter area for the future intersection. The grade through the intersection “platform” would be 2 percent, with the grades on the adjacent roadway sections steepened to 6 percent from Station 4897+50 to Station 4909+30. Full reconstruction of approximately 3300 feet SR 69 would be required. Side slopes would vary up to 1.5:1. No driveways would be impacted due to the modified profile regardless of widening alternative.

The other sub-alternative proposed the intersection near Station 4920+00, at the east driveway for Lowe’s. The existing profile grade of 4.8% would be maintained and the profile would be modified to provide a platform of 3%. Full reconstruction of SR 69 would be required for 1100 feet. Side slopes would vary up to 1.5:1. With this alternative, three driveways would be impacted regardless of widening alternative: Lowe’s east driveway and two driveways for Coca-Cola.

Figure 10 – Proposed Intersection Locations



### 3.4 Alternatives Evaluation

The City of Prescott abandoned its plans for the proposed intersection along SR 69, which eliminated the Widening with Future Intersection Alternatives. The remaining alternatives were developed further. Figures 11 and 12 show the eastern and western segments of the three widening alternatives. The evaluation matrix on the following page compares the remaining alternatives:

- No Build Alternative
- Widen SR 69 Symmetrically
- Widen SR 69 to the North
- Widen SR 69 to the South

The evaluation of the alternatives included the following evaluation criteria:

- Level of Service
- Constructability
- Drainage Impacts
- Driveway Impacts
- Potential Utility Conflicts
- Estimated R/W Needs
- Preliminary Earthwork Quantity
- Preliminary Construction Cost
- Environmental Impacts (see Chapter 5 for detailed analyses)
- Agency Acceptance



Figure 11 – Widening Alternatives on the East End of the Study Area



Figure 12 – Widening Alternatives on the West End of the Study Area



**Table 16 – SR 69 Widening Alternatives Selection Matrix**

CRITERION	NO BUILD ALTERNATIVE	WIDEN SR 69 SYMMETRICALLY	WIDEN SR 69 TO THE NORTH	WIDEN SR 69 TO THE SOUTH	COMMENT/ CONCLUSION
<b>Description</b>	Maintain existing roadway cross section.	Symmetrical widening throughout the project.	All widening completed to the north.	All widening completed to the south.	-
<b>Level of Service</b>	No improvement to future traffic operations.	All of the widening alternatives offer the same LOS improvement.	All of the widening alternatives offer the same LOS improvement.	All of the widening alternatives offer the same LOS improvement.	-
<b>Constructability</b>	N/A	Work will occur on both sides of SR 69, impacting both directions of traffic.	Work would occur on the north side of SR 69, reducing the impact to traffic during construction.	Work would occur on the south side of SR 69, reducing the impact to traffic during construction.	<b>WIDEN SR 69 TO THE NORTH</b> and <b>WIDEN SR 69 TO THE SOUTH</b> result in the least amount of impact to traffic.
<b>Drainage Impacts</b>	HW/D criterion at central culvert not improved	The central culvert is recommended for replacement. The east culvert will need to be extended approximately 32' and will require two new headwalls. The west culvert will be extended approximately 6' and will require one new headwall. 1050' of the wash on the south side of SR 69 would be impacted.	The central culvert is recommended for replacement. The east culvert will need to be extended approximately 22' and will require one new headwall. The west culvert will be extended approximately 5' and will require one new headwall. There would be no impacts to the wash on the south side of SR 69.	The central culvert is recommended for replacement. The east culvert will need to be extended approximately 22' and will require one new headwall. The west culvert will be extended approximately 5' and will require one new headwall. 1190' of the wash on the south side of SR 69 would be impacted.	<b>WIDEN SR 69 TO THE NORTH</b> has the least impact on existing drainage facilities and the wash on the south side of SR 69. (Expected impacts to Waters of the U.S. are similar for all build alternatives and are expected to require a Nationwide permit #14.)
<b>Driveway/Side Street Impacts</b>	None	13 driveways throughout the project will be impacted. The steepest driveway slope increased to 19.6% from 19%.	5 driveways on the north side of SR 69 will be impacted. The steepest driveway slope increased to 11.6% from 10.9%.	9 driveways on the south side of SR 69 will be impacted. The steepest driveway slope increased to 20.5% from 19%.	<b>WIDEN SR 69 TO THE NORTH</b> has the least impact on the existing driveways.
<b>Potential Utility Conflicts</b>	No conflicts	Conflicts with one pole of the fiber optic overhead crossing. Storm drain inlets, valves, and manholes will be impacted. The southern corners of the signal at Holiday Blvd will be impacted.	Conflicts with one pole of the fiber optic overhead crossing. Storm drain inlets, valves, and manholes will be impacted. The northern corners of the signal at Holiday Blvd will be impacted.	Conflicts with one pole of the fiber optic overhead crossing. Storm drain inlets, valves, and manholes will be impacted. The southern corners of the signal at Holiday Blvd will be impacted.	-
<b>Estimated R/W (Preliminary)</b>	0 acres	1.45 acres with six TCEs	1.5 acres and two TCEs	0.30 acres with six TCEs	<b>WIDEN SR 69 TO THE SOUTH</b> requires the least amount of new R/W.
<b>Earthwork Quantity (Preliminary)</b>	0 cubic yards	46,000 cubic yards	7,000 cubic yards	96,000 cubic yards	<b>WIDEN SR 69 TO THE NORTH</b> requires the least amount of earthwork.
<b>Estimated Construction Cost</b> (Preliminary, rounded. Includes R/W and final design. Does not include utility relocation or environmental mitigation costs.)	\$0	\$8,534,000	\$6,819,000	\$8,118,000	<b>WIDEN SR 69 TO THE NORTH</b> has the lowest estimated cost.

CRITERION	NO BUILD ALTERNATIVE	WIDEN SR 69 SYMMETRICALLY	WIDEN SR 69 TO THE NORTH	WIDEN SR 69 TO THE SOUTH	COMMENT/ CONCLUSION
Environmental Impacts (based on Environment Overview)	None	No federally protected plant or animal species are known to be present. Minor impacts on vegetation and biological resources. Air Quality and Noise Impacts are expected to be similar. No socio-economic impacts, including Environmental Justice/Title VI are expected. No known hazardous materials issues. Clean Water Act Nationwide Permit. Cultural Resource impacts are expected to be minimal, potential to impact one site.	No federally protected plant or animal species are known to be present. Minor impacts on vegetation and biological resources. Air Quality and Noise Impacts are expected to be similar. No socio-economic impacts, including Environmental Justice/Title VI are expected. No known hazardous materials issues. Clean Water Act Nationwide Permit. Cultural Resource impacts are expected to be minimal, potential to impact one site.	No federally protected plant or animal species are known to be present. Minor impacts on vegetation and biological resources. Air Quality and Noise Impacts are expected to be similar. No socio-economic impacts, including Environmental Justice/Title VI are expected. No known hazardous materials issues. Clean Water Act Nationwide Permit. Cultural Resource impacts are expected to be minimal. Would avoid the cultural site.	<b>The evaluation of social, economic, and environmental resources in the study area did not identify any substantive issues that would affect the selection of a viable alternative in the Feasibility Study. Specifically, the EO analysis concludes there are no “fatal flaw” impacts on social, economic, and environmental resources known for the study area. Impacts would be expected to be minor and within the normal range expected with a roadway widening project.</b>
Agency Acceptance	Lowest agency acceptance since traffic congestion is not addressed.	Moderate agency acceptance.	Most acceptable to local agencies because of constructability and fewer driveway/access impacts.	Moderate agency acceptance.	<b>WIDEN SR 69 TO THE NORTH</b> has the highest agency acceptance.

Recommendations

The Widen Symmetrically Alternative is not recommended for the following reasons:

- Similar LOS compared to other alternatives.
- Impacts steep existing driveways on the south side of SR 69.
- High volume of borrow material required, 46,000 cubic yards.
- Most substantial impact to traffic during construction with work on both sides of SR 69.
- Culvert will need to be extended to both sides.
- Impacts to the wash along the south side of SR 69.

The Widen to the South Alternative is not recommended for the following reasons:

- Similar LOS compared to other alternatives.
- Impacts steep existing driveways on the south side of SR 69.
- High volume of borrow material required, 96,000 cubic yards.
- Impacts to the wash along the south side of SR 69.

The Widen to the North Alternative is recommended for further study for the following reasons:

- Impacts driveways only on the north side of SR 69.
- Fewer impacts to traffic during construction with work on one side of the road.
- Lowest volume of borrow material required, 7,000 cubic yards.
- No impacts to the wash on the south side of SR 69.
- Culverts will need to be extended to one side only.
- Lowest construction cost.



# 4.0 Major Design Features of the Recommended Alternative

## 4.1 Introduction

This chapter will describe the major design features associated with the recommended SR 69 widening.

## 4.2 Design Controls

The SR 69 widening will be designed to meet current ADOT RDG and AASHTO design guidelines. Table 17 presents the preliminary roadway design criteria used to develop the recommended alternative.

Table 17 – Preliminary Design Criteria

DESCRIPTION OF CRITERION	VALUE FOR DESIGN
Functional Classification:	Principal Arterial - Urban
Design Year:	2040
ADT:	77,250
Elevation Range:	5430 feet to 5660 feet
Posted Speed:	45 mph
Design Speed:	50 mph
Number of Lanes, Lane Width:	6 lanes at 12 feet
Shoulder Width: Outside Shoulder Inside Shoulder	2' (=14' outside lane width, exclusive of C&G) N/A (12' two-way center left-turn lane)
Normal Cross Slope:	2.0%
Superelevation: (Elevation > 6000'):	Match existing
Median Barrier:	None; use 12' TWLTL
Minimum Horizontal Curve Length:	Match existing
Maximum Degree of Curve:	Match existing
Maximum Gradient:	6%
Maximum Driveway Gradient	6% desirable. Match or improve existing grades.
Side Slope:	4:1 typical 6:1 desirable
Sidewalk Width:	8' multi-use path on one side
Minimum Vertical Curve Length:	150 feet (3 X design speed)

DESCRIPTION OF CRITERION	VALUE FOR DESIGN
Design Vehicle:	WB 67 or as appropriate for specific locations
Taper Rate (Lane Drop): Taper Rate (Lane Addition):	50:1 (design speed (mph) to one) 25:1
Horizontal/Lateral Clearances: Clear Zone / Recovery Area Width:	30 feet

## 4.3 Horizontal and Vertical Alignments

### 4.3.1 Typical Section

The proposed typical section for SR 69 consists of three 12-foot travel lanes in both directions, with 2-foot outside shoulders and a 12-foot center two-way left-turn lane, for a total pavement width of 88 feet. Two lanes will be added to the north side of SR 69.

The typical section will also provide an 8-foot multi-use trail on the north side of SR 69.

The standard cross slope will be 0.020'/ft in tangent sections. Superelevation rates for horizontal curves will match the existing superelevation.

The existing pavement will be sawcut at the north edge of traveled way and new pavement will be added on the north side. Sawcutting and widening is more cost-effective than full pavement reconstruction because the existing pavement can be re-used. However, depending on the condition of the existing pavement when construction occurs, additional work on the existing pavement may be needed and the final design should re-evaluate the cost-effectiveness of sawcutting. For the purposes of this report, it was assumed that the existing pavement would be retained and sawcut as described for the cost estimate.

The existing crown is located in the center of the existing roadway. Widening entirely to the north would result in an asymmetrical crown location or would require that the location of the crown be moved. To shift the crown, a variable-depth milling of the existing pavement followed by new AC pavement at a uniform thickness is recommended.

### 4.3.2 Horizontal Alignment

No changes to the existing horizontal alignment are anticipated. A design alignment, approximately 11.8' from the existing horizontal alignment, was created to reflect the proposed center of the widened roadway. The geometry for the design alignment is shown in Appendix A.

### 4.3.3 Vertical Alignment

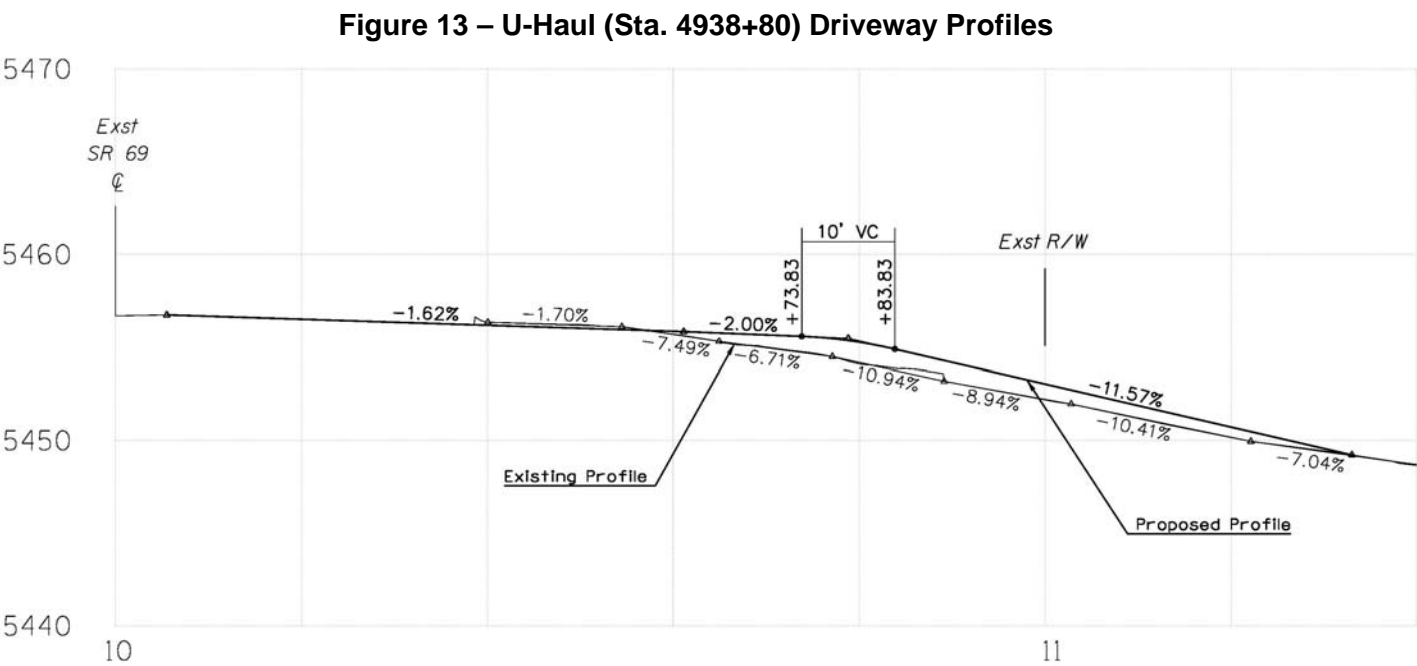
No changes to the existing vertical alignment are anticipated.

## 4.4 Access

SR 69 is not an access-controlled facility. Existing access points are allowed by permit from ADOT.

Several driveways and two intersections exist throughout the study area. Four driveways and one intersection would be impacted with the recommended alternative. Three of the driveways will be modified to accommodate the SR 69 widening using acceptable driveway grades. However, the profile grade for the

driveway at one location, the driveway for U-Haul at Station 4938+80, will require reconstruction at a slightly steeper grade to accommodate the recommended widening. This proposed driveway profile is shown in Figure 13.



#### 4.5 Right-of-Way

New right-of-way and temporary construction easements (TCEs) are necessary for the SR 69 widening. The approximate R/W requirement would be 1.5 acres plus 0.08 acres of TCE. The following table lists the R/W needs for the recommended widening alternative (widening to the north).

**Table 18 – Preliminary Right-of-Way Needs**

LAND OWNER	ACREAGE
U-Haul - TCE	0.04
Lowe's - TCE	0.04
ASLD	0.48
Private owners	0.28
Yavapai-Prescott Indian Tribe	0.74

Right-of-way lines shown on the drawings in this technical memorandum are based on limits of disturbance in the conceptual design layout and may not indicate the final right-of-way requirements or easements necessary for construction. Actual limits will be established during the final design process.

There are a number of section corners in the project area which are in or near the roadway. The monuments shall be preserved or replaced if disturbed by construction.

#### 4.6 Drainage Considerations

A preliminary drainage report was prepared for the SR 69 study in December 2014.

##### Existing Culvert Hydraulics

A hydraulic analysis was done for the existing culverts that were identified in the field surveys along the project. Culvert calculations were performed for both the 50-year and the 100-year design frequencies. Table 19 provides a summary of the existing culverts that were analyzed.

##### Proposed Culvert Hydraulics

Proposed culverts were sized to convey the 50-year discharge at a headwater elevation equal to or less than the headwater elevation determined for the 50-year discharge in the existing culvert hydraulic analysis.

Culvert headwaters were checked against the 100-year discharge to verify that properties adjacent to the ADOT right-of-way would not be adversely impacted. Headwater depths were also limited to a maximum of three inches below the adjacent edge of pavement elevation and the maximum allowable headwater was set at (HW/D) not to exceed 1.5.

A Manning’s roughness coefficient 0.013 was used for the concrete culverts.

**Table 19 – Culvert Headwater Summary**

CONCENTRATION POINT	50-YEAR EXISTING (ft)	100-YEAR EXISTING (ft)	50-YEAR PROPOSED (ft)	100-YEAR PROPOSED (ft)
West	5464.13	5465.20	5464.13	5465.20
Central	5465.86	5470.26	5461.99	5463.83
East	5520.54	5521.27	5521.56	5522.29

##### Catch Basin Design

The roadway inlets for this project are designed for the 10-year peak discharge. Curb opening inlets are used where curb and gutter exists or is proposed. Roadway inlets will be placed prior to cross slope reversals, upstream of intersections, and where the street capacity exceeds the maximum allowable spread. The existing roadway profile and superelevation are being retained. The new roadway configuration generally creates a maximum allowable roadway spread of 10 feet, which includes a 4-foot shoulder and half of the adjacent 12-foot lane. Where turning lanes are present, the roadway spread allowance is increased to include the turn lane width.

Roadway inlets, catch basins and scuppers are designed to meet acceptable flow depths and spread, and are generally sized for 90 percent interception with 100 percent interception at critical locations. Inlet capture ratios of 0.50 and 0.80 were applied to grated inlets and curb opening inlets, respectively. These clogging factors directly reduce the inlet efficiencies to yield a more conservative design.

All roadway widening is proposed along on the north side of SR 69. To accommodate the proposed widening, new inlets will be required along the proposed north edge. The existing inlets along the south side will be maintained. However, due to the roadway superelevation, flows from the proposed widening will cross the roadway to the south side, potentially affecting existing inlets along the south side.

Several of the existing inlets along the south side do not meet the 90% capture criteria but the spread criteria are maintained for most of the inlets. The additional flows from the roadway widening and superelevation result in violations of the spread criteria in two locations. Two additional inlets are required and are proposed to be scuppers matching the existing inlets adjacent to the proposed inlets. For the existing inlets where the spread criteria are met but the capture ratio is not met, additional inlets are not proposed.

Storm Drain Design

The storm drains outfall to cross culverts or ditches. Storm drains were designed such that the hydraulic grade line is at least six inches below the grate elevation or the gutter elevation at the inlets. A Manning's roughness coefficient of 0.013 was used in the analysis and the HEC-22 head loss method was applied.

There are a total of three proposed storm drain systems. The eastern system has four catch basins between Station 4904+50 and 4910+47 and outfalls to the offsite culvert system on the east side of Lowe's. The cross culvert is very deep and is not maintained by ADOT due to an agreement established with the City of Prescott. To provide maintenance access to the storm drain system, a manhole is being proposed immediately upstream of the proposed storm drain connection to the cross culvert. The layout is shown in Appendix C of the Preliminary Drainage Report.

The remaining two storm drain systems are west of Holiday Drive. One storm drain is the outfall for a catch basin at the Prescott Canyon Drive intersection that discharges to a wash west of Prescott Canyon Drive. The final storm drain system has a catch basin upstream of the business entrance approximately 475 feet west of Prescott Canyon Drive and another catch basin approximately 200 feet west of the business entrance that discharges to a wash adjacent to the western most catch basin.

**4.6.1 Offsite Drainage Features**

West Culvert

The west culvert is located on the west side of the SR 69/Holiday Drive intersection at Station 4929+27 (MP 294.6). The culvert is a two-barrel 8' x 7' concrete box culvert. The culvert slopes from south to north. The culvert has a 30 degree bend approximately 38 feet from the outlet end. Offsite flows approach the culvert from the south through a narrow channel. There are two vertical drops varying in height from approximately 2 feet to 3 feet upstream from the culvert. The culvert outlets downstream into a natural wash. The roadway is being widened along the north side in this area; therefore, the culvert only needs to be extended on the downstream side. The culvert location is shown in Figure 14.

Central Culvert

The central culvert is located near Lowe's, approximately 700 feet east of the SR 69/Holiday Drive intersection at Station 4921+42 (MP 294.4). The culvert is a single-barrel 6' x 7' concrete box culvert. The culvert slopes from the south to north and has a 30 degree bend approximately 20 feet downstream from the inlet and another 30 degree bend approximately 20 feet upstream of the outlet. ADOT maintenance personnel indicated that the oldest section of the culvert in the middle portion between the two bends was constructed of brick. When Lowe's was developed, a new culvert was constructed under the parking lot and connected to the existing culvert at the outfall. The new culvert is a single barrel 8' x 10' concrete box culvert that is approximately 1000 feet long.

Analysis of the culvert shows that existing headwater elevation violates ADOT's 1.5 depth to culvert height ratio at a ratio of 1.84. To meet the HW criterion, it is recommended that the existing culvert be upsized to a single barrel 8' x 8' concrete box culvert. The new culvert will be approximately 175 feet long and will

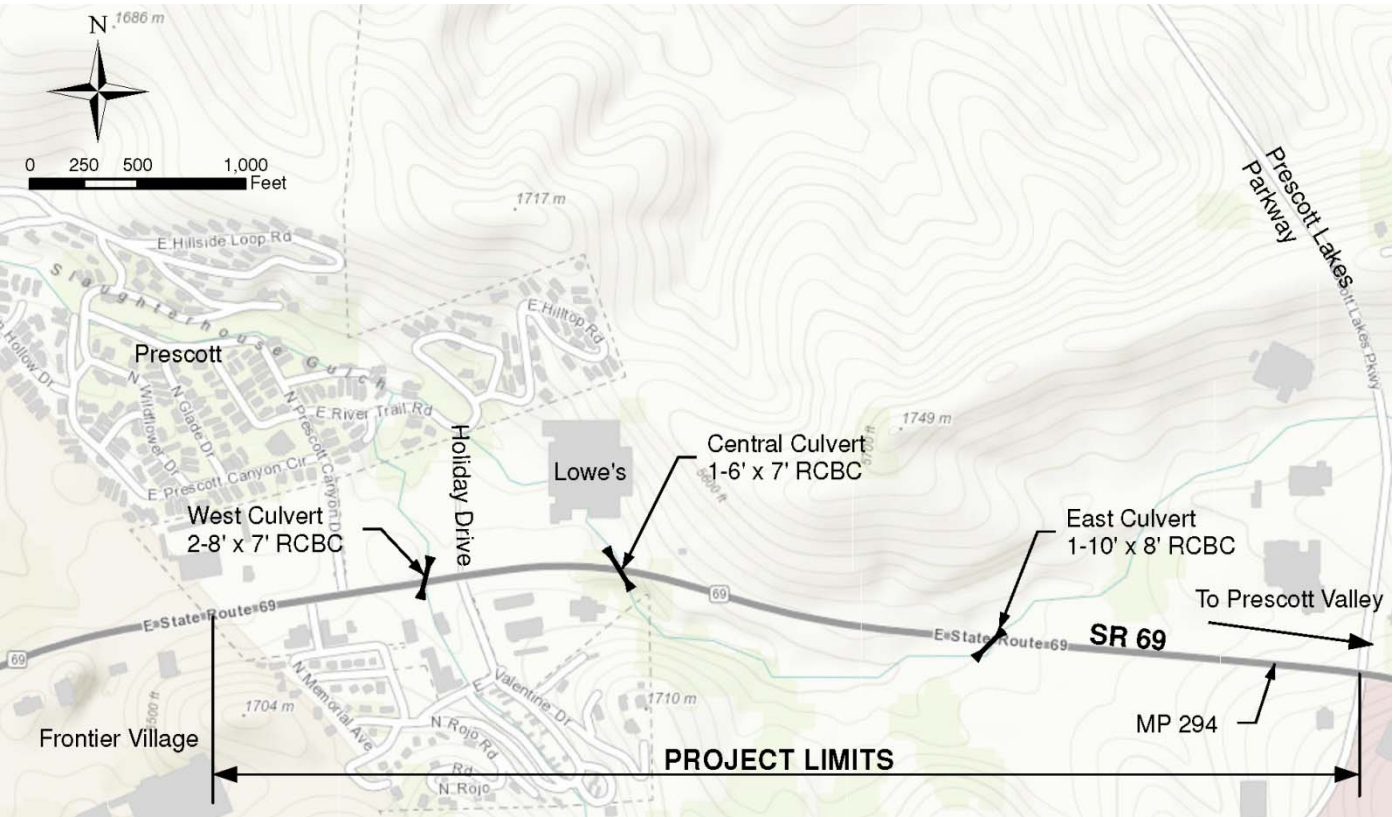
eliminate the two 30 degree bends. The new culvert would connect to the existing CBC under Lowe's. The culvert location is shown in Figure 14.

East Culvert

The east culvert is located approximately 0.3 mile west of the SR 69/Prescott Lakes Parkway intersection at Station 4898+00 (MP 294.1). The culvert is a single barrel 10' x 8' concrete box culvert. The culvert slopes from north to south and has a straight alignment with no internal bends. The culvert discharges to a wash that flows downstream to the central culvert.

This culvert will need to be extended on the north side (upstream) approximately 22 feet to accommodate the roadway widening. Since the culvert is operating under inlet control conditions, the extension of the culvert creates a rise in the headwater elevation of approximately one foot with the increase in invert elevation. The headwater will extend beyond the existing ADOT right-of-way. To account for this water surface rise, additional right-of-way would need to be obtained. The culvert location is shown in Figure 14.

**Figure 14 – Drainage Features**



Offsite Channels

At the east end of the project along the south side of SR 69, an existing storm drain system discharges from the parking lot of the Prescott Gateway Mall into ADOT right-of-way. There is a small riprap pad at the culvert outlet. Because of the steep slope downstream of the culvert outlet, the discharge has cut a ditch along the bottom of the slope beginning at the end of the riprap pad and continuing west to approximately Station 4895+50. The ditch is about 850 feet in length, 7 to 10 feet wide, and varies in depth from 8 to 12 feet. Portions of the ditch are at the toe of SR 69's fill slope and utilities running parallel to SR 69 have been exposed.



Improvements are recommended to minimize further damage within ADOT's right-of-way. These improvements include an energy dissipator at the culvert outlet. It is also recommended that the ditch be repaired to reestablish the grades in the area. The ditch should then be lined with riprap for the entire length. Finally, a cutoff wall should be placed at the downstream end of the ditch to help maintain the slope.

**4.6.2 Drainage Recommendations**

Widening recommendations from the preliminary drainage report include the following:

- Extension of the 10' x 8' and 2-8' x 7' concrete box culverts as a result of the roadway widening.
- Replacement of the existing 6' x 7' concrete box culvert that does not meet ADOT's 1.5 HW/D ratio with an 8' x 8' concrete box culvert within ADOT R/W.
- New catch basins with storm drains and scuppers to drain the paved areas.
- Improvements to alleviate erosion issues at the east end of the project along the south side of SR 69.

The final designer should coordinate with the Yavapai-Prescott Indian Tribe, which is conducting a study to evaluate mitigation for seasonal flooding within the Slaughterhouse Gulch drainage basin.

**4.7 Signing and Pavement Marking**

Existing signs along the north side of SR 69 will be relocated to accommodate the added pavement and path. Beyond the project limits on both ends of the project area, signing that indicates the width reductions from three lanes to two lanes will be eliminated or modified.

Pavement marking will be dual component epoxy. The legends and arrows will be preformed tape. Type C recessed pavement markers will be included at 40-foot spacing on the lane lines. Type D recessed pavement markers will be included at 80-foot spacing on the two-way left-turn lane striping.

**4.8 Joint Project Agreements / Intergovernmental Agreements**

An intergovernmental agreement would be needed if this section of SR 69 is turned over to the City of Prescott in the future.

**4.9 Section 404 of the Clean Water Act**

Coordination with the US Army Corps of Engineers (COE) will be necessary during project design to ascertain the need for any nationwide or individual permits required under Section 404 of the Clean Water Act. Any deposition of fill material or excavation below the ordinary high water mark will require a permit. Construction activities that would require permits include, but are not limited to, culvert installations, replacements and/or extensions requiring excavation and placement of fill material, and roadway embankment widening. Activities affecting Waters of the U.S. are expected to require a Nationwide Permit #14.

**4.10 Earthwork**

Earthwork factors, cut and fill slope recommendations, and material sources will be addressed later in project development. The shrink potential for the native soils throughout this segment of SR 69 was assumed to be 10%.

All disturbed areas will be seeded.

**4.11 Constructability and Traffic Control**

Existing movements and access must be maintained during construction. Work will occur on primarily one side of the roadway; approximately 6500 feet of temporary concrete barrier is estimated to protect the work area from traffic. Construction activities that disrupt traffic should be performed during off-peak hours whenever possible. The need for detours is not anticipated.

Final construction sequencing/phasing will be determined during final design. Traffic control requirements will be in accordance with the current edition of the *MUTCD*, the *Arizona Supplement*, the ADOT Traffic Control Design Guidelines, and/or by special provisions.

**4.12 Utilities**

During final design, each utility company will receive and review the preliminary design for this project and develop plans for any relocations and/or adjustments.

Preliminary utility conflicts include the fiber optic overhead crossing near Station 4939+50, storm drain inlets at Stations 4935+80 Rt, 4933+10 Rt, and 4897+40 Rt, and various minor impacts such as valve and manhole adjustments (one CenturyLink manhole at Station 4933+10 Rt is located partially in the shared-use path).

The northern two corners of the signalized intersection with Holiday Drive will be impacted, including one signal pole, two pedestrian signals, and several pull boxes. One 55-foot mast arm signal pole and one power pole are narrowly missed by the proposed widening; the contractor will need to use caution as these poles will be within a few feet of proposed work areas.

**4.13 Structures**

There are no existing or proposed structures within the project limits.

**4.14 Preliminary Pavement Design**

ADOT Materials or its consultant will provide recommendations for the pavement design later in the project development process. For purposes of this study, a pavement structural section of 7.5 inches of AC on 20 inches of AB (Class 2) with ½ inch AR-ACFC was assumed based on recent projects in the immediate area.

**4.15 Design Exceptions**

Existing geometric features within the study area were evaluated in an AASHTO Controlling Design Criteria Report in September 2014. The report is included in Appendix B.

The need for a design exception for superelevation was identified in the AASHTO report. The existing superelevation in the curve at MP 294.42 is 0.04'/ft., while the recommended minimum rate using AASHTO Method 5 is 0.045'/ft. However, when evaluated using AASHTO Method 2 for a posted speed limit of 45 mph or less, the recommended minimum superelevation is -0.079'/ft., which is satisfied by the existing condition and requires no design exception.

**4.16 Yavapai-Prescott Indian Tribe**

The Yavapai-Prescott Indian Tribe indicated that they would like a driveway added for future development along SR 69. The proposed addition of a driveway will add approximately \$55,000 to the project. The driveway location is shown on the plans in Appendix A.

## 5.0 Environmental Overview

### 5.1 Introduction

This Environmental Overview (EO) describes the existing environment, including social, economic, and natural resources, and identifies potential environmental issues associated with widening State Route 69 from MP 293.8 to MP 294.8, in Prescott, Yavapai County, Arizona, Figure 1 (Page 1) and Figure 2 (Page 2). This EO is not intended to provide compliance with the National Environmental Policy Act (NEPA) but is meant to identify, early in the planning process, those issues, constraints, and opportunities that should be considered in the analysis of alternatives. The information presented in this document is based on an existing records review, coordination with local jurisdictions and regulatory agencies, and limited field review. Future analyses will address environmental considerations in greater detail.

Throughout the EO, the term “study area,” as shown in Figure 3 on Page 2, refers to a corridor generally ¼ mile on either side of SR 69. Data collection and analysis of potential issues or impacts extend as much as three miles outside the study area. The results of the Feasibility Study will assist ADOT and the City of Prescott in determining how best to proceed with the project into the programming and design phases.

#### 5.1.1 Alternatives

This EO addresses the roadway widening alternatives evaluated in the previous chapters: widening on both sides of the roadway, widening to the north, widening to the south, and a no-build alternative. All build alternatives retain the general SR 69 alignment; no alternate route or realignment options were considered. All three build alternatives are carried through the analysis equally because none of the alternatives was deemed to have a fatal flaw that would require removal from consideration.

##### No Build Alternative

With the no build alternative, the existing roadway would remain two lanes in each direction with a center turn lane; no capacity improvements would be undertaken. Regular maintenance and intersection or turning-lane improvements would continue. In the future Design Concept Report (DCR)/environmental documentation phase, the no build alternative will be carried forward for comparison.

##### Build Alternatives

Three build alternatives have been carried through the Feasibility Study: Widen SR 69 Symmetrically to Both Sides, Widen SR 69 to the North, and Widen SR 69 to the South as shown in Figure 15 (Page 22). A fourth alternative to add a new arterial roadway and intersection to SR 69 between Prescott Lakes Parkway and Holiday Drive was considered at the request of the City of Prescott. After preliminary evaluation, this alternative was dropped from consideration and not evaluated in the EO.

### 5.2 Affected Environment and Environmental Concerns

This section describes the affected environment for the overall study area and the environmental concerns for the study corridor by resource topic. Recommendations for additional analysis and coordination are identified in the Environmental Concerns sections throughout this document. For each aspect of the affected environment addressed below, additional analysis would be conducted later during design.

Based on a review of available information, no prime or unique farmlands (NRCS 2014), wetlands (USFWS 2014a), wilderness areas (Arizona Land Resource Information System [ALRIS] 2014), or wild and scenic

rivers (National Wild and Scenic Rivers 2014) are present in the study area. Therefore, these items are not discussed further in this EO.

#### 5.2.1. Physical and Natural Environment

##### Topography/Physiography

##### *Affected Environment*

The study area lies on moderately rolling terrain within the Upper Verde River Watershed (EPA 2014). The only named drainage in the study area is Slaughterhouse Gulch (Yavapai County 2014a), which has several unnamed smaller tributaries that drain the areas east and south of the study area. The tributaries of Slaughterhouse Gulch are conveyed under SR 69 through concrete box culverts near MP 294.1, under the Lowe’s parking lot, and just west of the Holiday Drive intersection. This is shown in Figure 16 (Page 23). These tributaries converge into Slaughterhouse Gulch just beyond the northwest corner of the Lowe’s parking lot. From this point, Slaughterhouse Gulch is an intermittent drainage that flows to the northwest and drains into Granite Creek approximately 1.0 mile northwest of the study area, eventually entering the Verde River approximately 22 miles north of the study area.

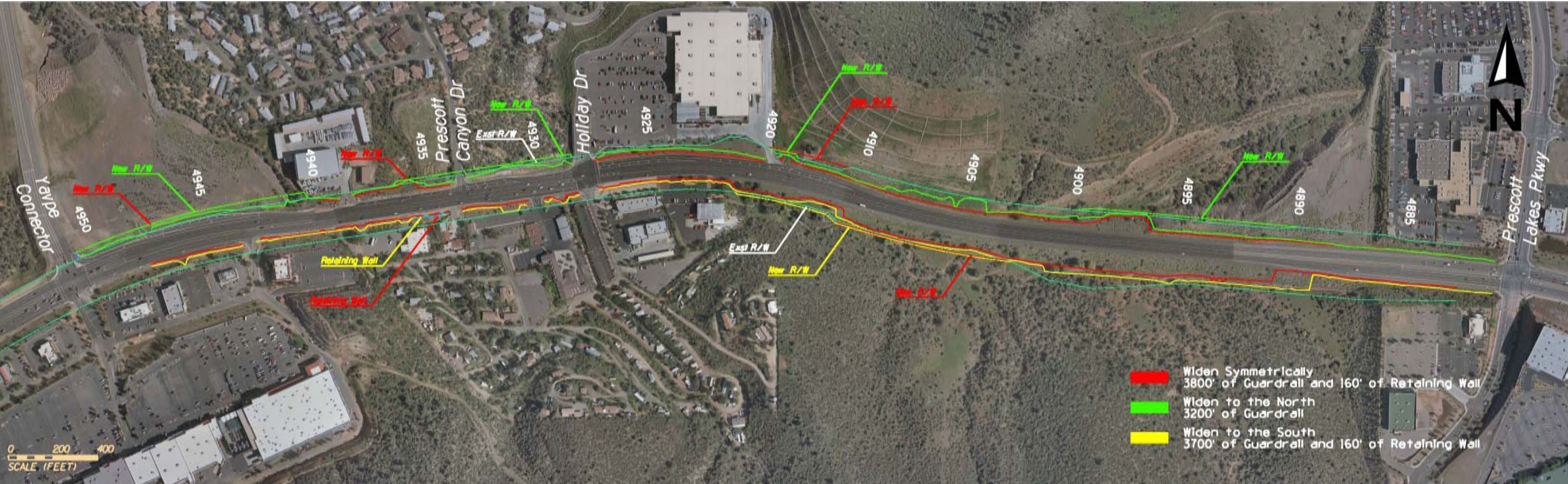
The study area lies within the gentle to moderate slopes of the northern foothills of the Bradshaw Mountains at approximately 5,400 to 5,600 feet elevation. The terrain becomes increasingly steeper and rugged progressing south and into the Bradshaw Mountains, which rise to 7,797 feet at Union Peak approximately 10 miles south of the study area.

North of the study area, the foothills of the Bradshaw Mountains transition to the Yavapai Hills and then the relatively flat landscape of Chino Valley and Lonesome Valley.

Soils in the western portion of the study area are dominated by those of the Lonti-Balon-Lynx Association. These are deep, well-drained, moderately fine and fine-textured to gravelly, nearly level soils on floodplains and undulating to steep valley slopes and plains. They are mixed old alluvium, and in mixed recent alluvium, weathered mainly from granite, schist, sandstone, shale, limestone, and volcanic rocks. Soils toward the eastern end of the study area are of the Cabezon-Thunderbird-Springerville Association. These are well-drained, shallow to deep, gravelly, cobbly and stony, fine-textured, nearly level to very steep soils on basaltic plains, mesas, hills, and very steep escarpments. They are in residuum and alluvium weathered from basalt and ash-flow tuffs, cinders, and related volcanic materials (Hendricks 1985).

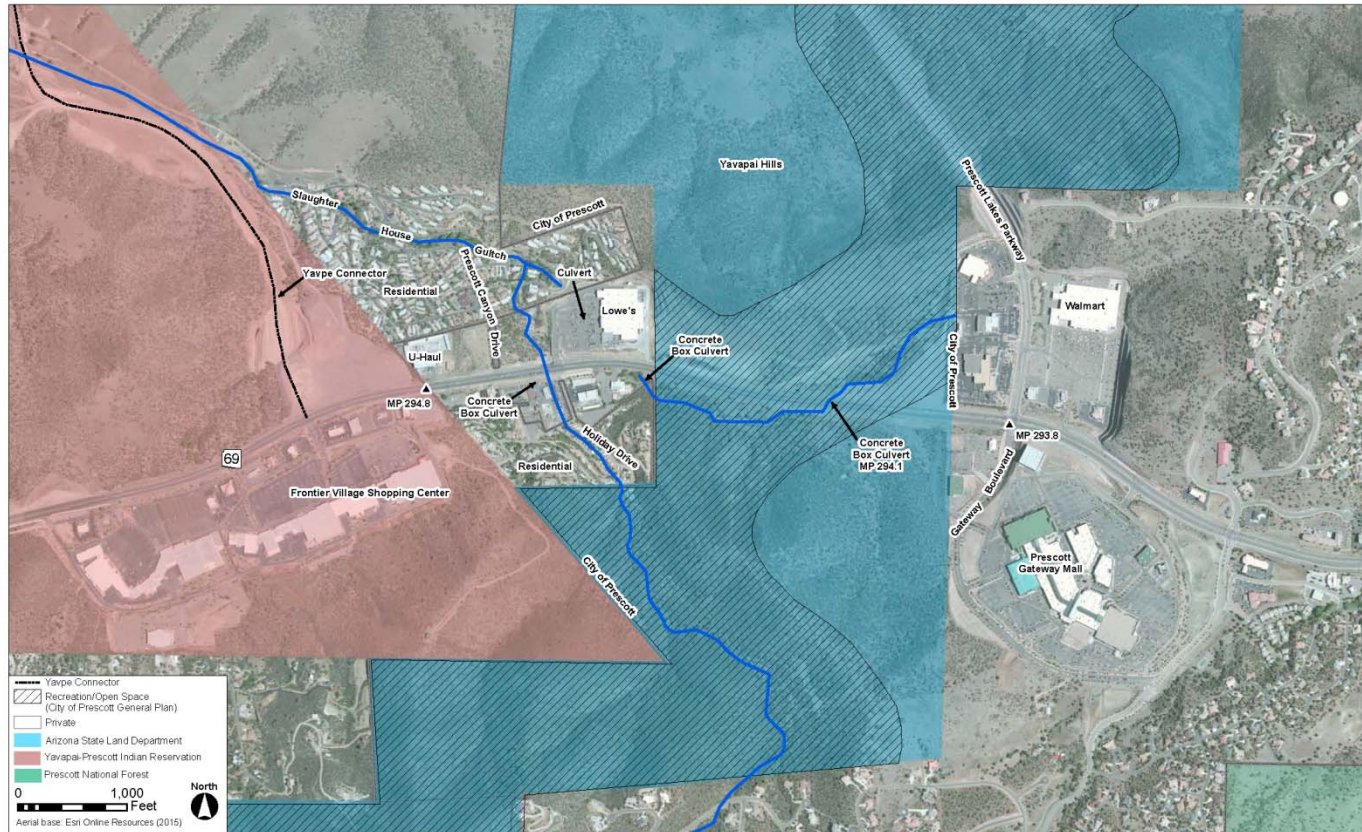


Figure 15 – SR 69 Alternatives





**Figure 16 – Project Features**



#### Environmental Concerns and Recommendations for Further Analysis

Local landforms and topography would be slightly altered by cut/fill activities required for widening approximately one mile of SR 69 and extending drainage structures to accommodate the wider roadbed. However, impacts would be minimal because the roadway and drainage structures already exist and will be modified along their current alignments. Widening of SR 69 in the study area would not be precluded by existing topography, landform, geologic features, soil, or drainages. It is expected that no substantive changes would occur to local drainage; however, an analysis of drainage needs would occur during design. A geotechnical evaluation of soils would also be expected during design to determine roadbed, pavement, slope protection, and other structural needs.

The three build alternatives would have similar effects on topography. Widening the pavement would require earthwork on the side slopes outside of the current roadway cross-section. The Widen SR 69 Symmetrically and Widen SR 69 to the South alternatives would require more guardrail and retaining walls than the Widen SR 69 to the North alternative to address the topography cross-slope. The Widen SR 69 Symmetrically and Widen SR 69 to the South alternatives would require approximately 3,700 feet to 3,800 feet of guardrail and 160 feet of retaining wall. The Widen SR 69 to the North alternative would require approximately 3,000 feet of guardrail and no retaining walls.

#### **5.2.2. Vegetation**

##### Affected Environment

Vegetation in the area is transitional between interior chaparral and Great Basin and Plains grassland and includes elements of Great Basin conifer woodland and Rocky Mountain (Petran) conifer woodland (Turner

and Brown 1994). Vegetation includes patches of chaparral dominated by species such as Sonoran scrub oak (*Quercus turbinella*) and squawbush (*Rhus trilobata*), and including others like alderleaf mountain mahogany (*Cercocarpus montanus*) and Stansbury cliffrose (*Purshia stansburiana*). Within these patches, woodland trees, such as twoneedle pinyon (*Pinus edulis*) and Utah juniper (*Juniperus osteosperma*), are scattered. Chaparral patches are interspersed with more open areas dominated by grassland species like sideoats grama (*Bouteloua curtipendula*), hairy grama (*Bouteloua hirsuta*), cane beardgrass (*Bothriochloa [Andropogon] barbinodis*), plains lovegrass (*Eragrostis intermedia*), and the introduced Lehmann lovegrass (*Eragrostis lehmanniana*). Historic land uses have resulted in the increased abundance of such species as wait-a-minute bush (*Mimosa aculeaticarpa* var. *biuncifera*), broom snakeweed (*Gutierrezia sarothrae*), purple pricklypear (*Opuntia macrocentra* var. *macrocentra*), and whipple cholla (*Cylindropuntia whipplei*). Native vegetation along the study corridor is largely confined to undeveloped areas.

Development of the SR 69 transportation corridor has removed native vegetation within and along the roadway out to the edge of the clear zone beyond the built-up shoulder. Land development adjacent to the study area has also removed native vegetation, in part or entirely, from some parcels. There is limited landscaping in areas west of Lowe's, adjacent to commercial development. Natural growth of some native shrubs and grasses has resulted in the restoration of a semi-natural vegetation community in previously disturbed areas. Disturbed areas typically support a mix of volunteers from the native plant community and invasive native and exotic species adapted to the colonization of disturbed terrain. Invasive species would likely include desertbroom (*Baccharis sarothroides*), camphorweed (*Heterotheca subaxillaris*), carellessweed (*Amaranthus palmeri*), prickly Russian thistle (*Salsola tragus*), and others.

#### Environmental Concerns and Recommendations for Further Analysis

Any widening or improvement of SR 69 in the study area has the potential to affect native plants, including shrubs and trees protected under the Arizona Native Plant Law. The majority of the relatively undisturbed vegetation is on the eastern end of the study area from the Lowe's commercial development to Prescott Lakes Parkway. West of Lowe's to the Yavpe Connector development, both sides of the roadway supports only limited naturally occurring vegetation.

All three build alternatives would impact some native vegetation. The Widen SR 69 to the South alternative would impact the greatest surface area due to potential fill slopes or retaining walls needed on the south side of SR 69. The Widen SR 69 Symmetrically alternative would have the least impact because the need for fill slopes or walls would be reduced on both north and south side of the roadway. The Widen SR 69 to the North alternative would have slightly less impact than the Widen SR 69 to the South alternative due to large areas on the north side of the roadway that have been previously cleared of vegetation. The loss of native plants and the presence of invasive species would not represent a substantial obstacle to the proposed SR 69 widening.

Native plant removal would be subject to the Arizona Native Plant Law and require notification to the Arizona Department of Agriculture.

#### **5.2.3. Biology**

##### Affected Environment

##### *Threatened and Endangered Species*

The U.S. Fish and Wildlife Service (USFWS) Information, Planning, and Conservation (IPaC) System website was accessed on October 31, 2014 (USFWS 2014b). An official list of federally protected species with the potential to occur in the SR 69 study area was obtained. This list was reviewed by a qualified biologist (Stephen Hale, EcoPlan Associates, Inc.) to determine which species may occur in the study area, shown in Table 20 below.



**Table 20 – USFWS Listed Species, Status, Habitat Requirements, and Potential for Occurrence in the Study Area**

NAME	STATUS	HABITAT REQUIREMENTS	POTENTIAL FOR OCCURRENCE
<b>Birds</b>			
Mexican spotted owl <i>Strix occidentalis lucida</i>	T	Mixed conifer or pine forest with multilayered foliage structure in steep canyons or on high mesas. Elevation: 4,100 to 9,000 feet.	No suitable habitat. No mixed conifer or pine forest with multilayered foliage structure in steep canyons or on high mesas in study area. The nearest population of Mexican spotted owls lies in the Bradshaw Mountains to the south of the study area. Although there are no records of owls within 3 miles, designated critical habitat for the species extends to within 3 miles south of the study area.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	E	Cottonwood/willow and saltcedar vegetation communities along rivers and streams. Elevation: <8,500 feet.	No suitable habitat. No cottonwood/willow and saltcedar vegetation communities along rivers and streams in the study area. The nearest seasonal records of occurrence for the species to the study area lie along the Verde River approximately 30 miles north of the study area.
Yellow-Billed Cuckoo <i>Coccyzus americanus</i>	T	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries). Elevation: <6,500 feet.	No suitable habitat. No large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries) in the study area. The species nests along the Verde River within 30 miles to the north of the study area and there is a single record of occurrence within 10 miles west of the study area.
<b>Fishes</b>			
Headwater chub <i>Gila nigra</i>	C	Found in middle to headwater reaches of medium-sized streams of the Gila River basin. Usually found in large pools and associated with cover such as undercut banks, large pools, or deep places created by obstructions like trees or rocks. Typical adult microhabitat consists of deep, pools near shore adjacent to swifter riffles and runs. Elevation: 3,035 to 6,651 feet	No suitable habitat. There are no perennial streams in the study area. The nearest records of occurrence lie in tributaries of the Verde River approximately 40 miles to the east of the study area.
Roundtail chub <i>Gila robusta</i>	C	Cool to warm water in rivers and streams throughout the Colorado River basin. Often occupying open areas of the deepest pools and eddies of mid-sized to larger streams. Often associated with areas of cover in the form of boulders, overhanging cliffs, undercut banks, or vegetation. Elevation: 1,210 to 7,220 feet, more commonly found between 2,000 and 5,000 feet.	No suitable habitat. There are no perennial streams in the study area. The nearest records of occurrence lie along the Verde River and some of its tributaries to within approximately 30 miles north of the study area.
<b>Mammals</b>			
Black-footed ferret <i>Mustela nigripes</i>	EPNE	Grassland plains on mountain basins to elevation. Usually found in association with prairie dogs, which serve as their primary food source while also providing the ferrets with abandoned burrows for shelter. Elevation: 5,250 to 6,234 feet.	No suitable habitat. No prairie dog towns are in the study area. The nearest records of occurrence lie in the Aubrey Valley approximately 50 miles northwest of the study area.
<b>Reptiles</b>			
Northern Mexican gartersnake <i>Thamnophis eques megalops</i>	T	Found in cienegas and stock tanks and river habitat that includes pools and backwaters. Elevation: 3,000 to 8,500 feet.	No suitable habitat. There are no areas of perennial water in the study area. Though there are historic records from along the lower Agua Fria River, as well as one isolated record within approximately 10 miles west of the study area, these populations have been extirpated. The nearest extant population occurs in the vicinity of the Page Spring Fish Hatchery, along Oak Creek, a tributary to the Verde River approximately 35 miles north of the study area.
<b>Snails</b>			
Page springsnail <i>Pyrgulopsis morrisoni</i>	C	Springs, seeps, cienegas, marshes, spring pools, outflows, and diverse lotic waters. The most common habitat is a rheocrene, or a spring, emerging from the ground as a free-flowing stream. Elevation: 3,500 feet.	No suitable habitat. No springs or marshes are in the study area. The Page springsnail is only known from the vicinity of the Page Spring Fish Hatchery, along Oak Creek, a tributary to the Verde River approximately 35 miles north of the study area.

C = Candidate, E = Endangered, EPNE = Experimental Population, Nonessential, T = Threatened

Other Special Status Species

The Arizona Game and Fish Department (AGFD) On-line Environmental Review Tool (AGFD 2014) was accessed on October 29, 2014, to determine other special status species known to occur within 3 miles of the study area (Table 20). The AGFD On-line tool identified the Yavapai-Prescott Indian Reservation, critical habitat for the Mexican spotted owl, and the federally protected species listed in Table 21.

Table 21 – Other Special Status Species in Yavapai County, Arizona, and Evaluation of Effects

SCIENTIFIC NAME	COMMON NAME	STATUS	SUITABLE HABITAT PRESENT?	OCCUPIED HABITAT PRESENT?	SPECIES AFFECTED?
<i>Anaxyrus microscaphus</i>	Arizona toad	SC	No	No	No
<i>Aquila chrysaetos</i>	Golden eagle	BGA, S	No	No	No
<i>Coccyzus americanus</i>	Yellow-billed cuckoo	T, S, WSC	No	No	No
<i>Erigeron anchana</i>	Mogollon fleabane	SC, S	No	No	No
<i>Haliaeetus leucocephalus</i> (wintering population)	Bald eagle–winter population	SC, BGA, S, WSC	No	No	No
<i>Haliaeetus leucocephalus</i> pop. 3	Bald eagle–Sonoran Desert population	SC, BGA, S, WSC	No	No	No
<i>Megaceryle alcyon</i>	Belted kingfisher	WSC	No	No	No
<i>Phlox amabilis</i>	Arizona phlox	S	Yes	Yes	Yes
<i>Setophaga ruticilla</i>	American redstart	WSC	No	No	No

BGA = Bald and Golden Eagle Protection Act, S = U.S. Forest Service or Bureau of Land Management Sensitive, SC = USFWS Species of Concern, T = Threatened, WSC = Wildlife of Special Concern in Arizona (AGFD 2014)

The AGFD responded to the project scoping with a letter (see Appendix C) as a follow-up to the AGFD tool search results. The letter reiterates that the tool results show the golden eagle (special status species), yellow-billed cuckoo (proposed threatened and endangered species), and designated critical habitat for the Mexican spotted owl are within three miles of the project area. As noted in Table 20 and Table 21, no suitable habitat for these species is known to be present. As the project development process continues, a review of USFWS listed species and special status species would be required.

Wildlife Movement Corridors and Linkages

The movement of wildlife through the study area depends on the availability of preferred habitat, foraging range, migration, and dispersal patterns. Many resident birds and terrestrial wildlife species find the limited cover, altered habitat, and the presence of structures and roads in developed areas to be a barrier to movement. For these species, wildlife corridors include gaps in development where animals are funneled between patches of preferred habitat. A review of aerial photographs, literature from wildlife management agencies, wildlife-vehicle collision data, and anecdotal information were combined to locate and determine potential wildlife movement corridors and linkages in the study area (ADOT 2006).

The roadway, traffic, noise, development, and right-of-way fencing associated with SR 69 pose barriers for most large mammals and other terrestrial species seeking to disperse across the study area, increasing mortality rates and the likelihood of negative wildlife-human interactions. Some individuals may avoid the corridor altogether, remaining within preferred habitat of undeveloped areas north and south of the roadway well away from SR 69. Terrestrial wildlife seeking to cross SR 69 may frequent areas where relatively undisturbed habitat abuts the roadway and where drainage crossing structures exist; however, wildlife-vehicle collision (WVC) data collected along this section of SR 69 suggest that wildlife are also crossing the open roadway where no crossing structures exist, placing motorists and wildlife in danger (Appendix C, Norris Dodd memo).

Wildlife use minimally disturbed and undeveloped areas as movement corridors due to their isolation from human disturbances. The natural drainage channels (tributaries to Slaughterhouse Gulch) crossing the study area may act as wildlife corridors because they provide isolated areas, as well as uninterrupted passages, between disconnected wildlife habitats. These movement corridors are beneficial to wildlife because they provide:

- Continuous natural corridors through areas of development
- Ephemeral water sources
- A visual screen from surrounding development, which increases actual and perceived sense of security
- A corridor of preferred habitat for riparian birds
- Habitat and migration corridors for smaller terrestrial species (rodents, reptiles, and amphibians)
- Habitat for xeroriparian plant species

A larger tributary to Slaughterhouse Gulch crosses SR 69 through a concrete box culvert at MP 294.1 within one of the few areas where undeveloped terrain abuts either side of SR 69 in the study area. This culvert is 8 feet tall and 10 feet wide and approximately 235 feet long. It is not ideal for use by larger wildlife species due to the relationship between the length and opening. To meet AGFD guidelines, the culvert width would need to be in the range of a 10-foot by 18-foot opening. The location represents the most favorable corridor for the safe passage of wildlife from one side of the highway to the other in the study area.

The Arizona Wildlife Linkages Workgroup is a cooperative effort among ADOT, the USFWS, the Bureau of Land Management (BLM), the AGFD, and several other federal and state agencies, academic institutions, and conservation organizations. This group has identified known and potential wildlife corridors and developed the Arizona’s Wildlife Linkages Assessment. The Workgroup has identified Linkage 35, *East-West Prescott National Forest Linkage*, a wildlife movement corridor between mountain ranges and other areas of preferred habitat north and south of SR 69 (AFGD 2013). The study area lies within this wildlife linkage area, which is a movement corridor across SR 69 for species such as mule deer, javelina, coyote, mountain lion, bobcat, fox, and others. Maintaining linkages between blocks of habitat helps to ensure that wildlife populations remain healthy and viable by allowing day-to-day movement, seasonal migration routes, dispersal of offspring, and gene flow, and increasing the potential for recolonization of unoccupied habitat.

A draft 10-year study of WVCs conducted by ADOT within the study area showed the seventh highest incidence of WVCs (1.8 WVCs/mile/year) in Arizona between 2004 and 2013 (ADOT 2014). Species involved in these incidents are not specified; however, given that there is a mule deer population in the area, it is assumed that the majority of the SR 69 WVCs involved mule deer.

#### Environmental Concerns and Recommendations for Further Analysis

Proposed project improvements have limited or no potential to affect plants and wildlife identified in the AGFD special status species list or the USFWS threatened and endangered species list. During the DCR/ environmental documentation phase, a more detailed Biological Evaluation would be needed to determine the specific presence/absence of protected species and potential mitigation measures. Further coordination with the USFWS, the AGFD, the Yavapai-Prescott Indian Tribe, the Arizona Wildlife Linkages Workgroup, and the City of Prescott would also be needed.

The primary known species of concern based on the limited data collection and field review would be the Arizona phlox (*Phlox amabilis*), a U.S. Forest Service sensitive species. There is a record for the species adjacent to SR 69 in the study area; therefore, there is the likelihood that additional individuals may be present and impacted by project activity.

The study area lies within the *East-West Prescott National Forest Linkage* wildlife movement corridor, which will be affected by the proposed project. The wildlife corridor identified in this document is based on current data, information obtained from Arizona's Wildlife Linkages Assessment, and communication with ADOT. Widening of SR 69 will increase the width of the roadway, creating a greater barrier to wildlife passage than the existing roadway. However, if features to reduce and mitigate the effects to wildlife are incorporated in the final design, safe wildlife passage may be improved along SR 69 in the study area.

Design features to address WVC issues along the portion of SR 69 encompassing the study area should be incorporated in the final design for this project. In an internal memorandum dated September 16, 2014 (Appendix C), Norris Dodd, Wildlife Connectivity Program Coordinator, ADOT Environmental Planning Group provided several design recommendations to reduce the potential for WVCs in the study area related to the project:

- Signage to alert motorists to the risk of WVCs
- Avoidance of design features, such as raised median barriers, that may inhibit the movement of wildlife across SR 69 and exacerbate the potential for WVCs
- Installation of ungulate barrier fencing along either side of the SR 69 roadway, anchored to commercial development at each end of the project stretch, to funnel wildlife to the concrete box culvert at MP 294.1

There are minimal differences between the three build alternatives related to impacts. The mitigation measures noted above could be provided with any of the build alternatives. Consideration of a wildlife crossing/underpass at MP 294.1 should be balanced with future development in this area.

During the design process for this project, it is recommended that the design team coordinate with the AGFD, the USFWS, the Yavapai-Prescott Indian Tribe, the Arizona Wildlife Linkages Workgroup, and the City of Prescott to determine the appropriate design elements and features to protect wildlife from roadway traffic and allow for safe movement of wildlife across the study area. A survey for protected native plants (as defined by the Arizona Department of Agriculture) should be undertaken during future project design and environmental analyses in compliance with the Arizona Native Plant Law.

#### **5.2.4. Hydrology**

##### Affected Environment

##### *Floodplains*

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) 04025C2070G, revised September 3, 2010, indicates that the study area does not fall within a 100-year

floodplain (FEMA 2014). The Yavapai County Flood Control District noted no concerns with the project. Floodplain administration in the project area is the responsibility of the City of Prescott (Appendix C).

##### *Water Quality*

Section 404 of the Clean Water Act regulates the placement of fill or dredged material into Waters of the United States (Waters). The U.S. Army Corps of Engineers has regulatory jurisdiction of Waters. A Section 401 Water Quality Certification, which is administered by the Arizona Department of Environmental Quality (ADEQ), is required for any action subject to Section 404; however, most projects that fall under a Nationwide Permit are conditionally certified under Section 401. In Arizona, Waters generally include rivers, natural ponds, lakes, most washes, wetlands, and some canals.

Two drainages, tributaries to Slaughterhouse Gulch, cross SR 69 near MP 294.1, under the Lowe's parking lot, and just west of the Holiday Drive intersection shown in Figure 16 (Page 23). Both drainages exhibit characteristics indicative of Waters.

The project is expected to disturb more than one acre of land, requiring a Clean Water Act Section 402 Arizona Pollutant Discharge Elimination System permit.

##### *Sole Source Aquifer*

The study area is not within a sole source aquifer as designated by the US Environmental Protection Agency (EPA). In accordance with the November 2002 EPA/FHWA Memorandum of Understanding, a Safe Drinking Water Act Section 1424(e) review by the EPA would not be required for this project. Depth to groundwater based on registered wells in the study area varies from 30 feet to 160 feet (Allands 2014).

#### Environmental Concerns and Recommendations for Further Analysis

There would be no impacts to floodplains or Sole Source Aquifers because the study area does not fall within or intersect these types of features. However, the two tributary drainages to Slaughterhouse Gulch that cross SR 69 would likely be considered Waters. Because the project would likely extend structures for these drainages into areas expected to be Waters, a jurisdictional delineation should be conducted to identify all Waters in the study area. Drainage analysis during design would be needed to determine the degree of impact. Work within Waters would be anticipated to qualify under a Section 404 Nationwide Permit 14 for Linear Transportation Projects. If permanent impacts to Waters would be less than 0.1 acre, the work could qualify for a non-notifying Nationwide Permit. Under the Nationwide Permit category, Section 401 Water Quality is conditionally certified.

All three build alternatives have the potential to impact Waters. Each alternative would include lengthening the three existing box culverts that cross under SR 69. The Widen SR 69 Symmetrically and the Widen SR 69 to the South alternatives would have the greatest potential impact on Waters because a wash parallels the south side of SR 69 for about 1,400 feet between Prescott Lakes Parkway and Lowe's. This wash is shown in Figure 16 (Page 23). Depending on the slope protection measures used, fill could encroach on this wash with widening to the south.

#### **5.2.5. Noise**

The following terms are used to quantify impacts and define sound levels:

- *Decibel*. A decibel (dB) is a unit of measure for the intensity or loudness of sound.
- *dBA*. The dBA represents the noise levels in decibels measures with an A-weighted frequency. The A-weighting corresponds to the A-scale on a standard sound level instrument that closely approximates frequencies that the human ear can detect.

- *L<sub>eq</sub>*. *L<sub>eq</sub>* is defined as the equivalent continuous sound level. For normal human hearing, the actual sound level measurement is modified by applying A-weighting. The A-weighted sound level is the most widely used measure of environmental noise. *L<sub>Aeq1h</sub>* is used when *L<sub>eq</sub>* is measured hourly and the A-weighted scale is used.

The key regulations and guidance that assist in the determination of noise impacts in Arizona and when it is applicable to provide mitigation for impacted receptors include:

- FHWA Procedures for Abatement of Highway Traffic Noise and Construction Noise (Code of Federal Regulations [CFR] Title 23, Part 772)
- FHWA Highway Traffic Noise Analysis and Abatement Guidance, July 2010 (FHWA 2010)
- ADOT Noise Abatement Policy, July 2011 (ADOT 2011)

CFR Title 23, Part 772, provides procedures for preparing operational and construction noise studies and evaluating noise abatement considered for federal and federal-aid highway projects. Under CFR Title 23, Part 772.7, projects are categorized as Type I, Type II, or Type III. A Type I project includes construction of a highway on a new location; physical alteration of an existing highway; addition of a new through lane, high-occupancy-vehicle lane, or auxiliary lane; addition or relocation of interchange lanes or ramps added to complete an existing partial interchange; restriping existing pavement for the purpose of adding a through traffic lane or auxiliary lane; or addition of a new or substantial alteration of a weigh stations, rest stops, ride share lot, or toll plaza. A noise analysis is required for all Type I projects. A Type II project is a noise barrier retrofit project that involves no changes to highway capacity or alignment. ADOT does not currently have a Type II program. A Type III project is one that does not meet the classification of a Type I or Type II project. The addition of turn lanes would be a Type III project. Type III projects do not require a noise analysis. The proposed improvements include the addition of through lanes, which is considered a Type I project. Therefore, a noise analysis is required.

The FHWA Noise Abatement Criteria (NAC) has defined noise levels for land activity categories (Table 22). ADOT has adopted these NAC and established thresholds for noise levels that approach the FHWA NAC. ADOT defines this threshold as 3 dBA below the NAC for Categories A–E. Categories F and G do not have a noise impact threshold. FHWA guidelines also state that noise abatement should be considered when the noise levels substantially exceed the existing noise levels (CFR Title 23, Part 772.5[g]). This criterion is defined by ADOT as increases in the *L<sub>eq</sub>* of 15 dBA or more above existing noise levels.

**Table 22 – FHWA Noise Abatement Criteria. Hourly A-Weighted Sound Level Decibels (dBA)**

ACTIVITY CATEGORY	<i>L<sub>Aeq1h</sub></i> EXTERIOR	<i>L<sub>Aeq1h</sub></i> INTERIOR	DESCRIPTION OF ACTIVITY CATEGORY
A	57	–	Lands on which serenity and quiet are of extraordinary significance and serve an important public need, and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose
B <sup>a</sup>	67	52	Residential
C1	67	–	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings
D	–	52	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios
E <sup>a</sup>	72	–	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F
F	–	–	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing
G	–	–	Undeveloped lands that are not permitted for development

<sup>a</sup> Includes undeveloped lands permitted for this activity category.

**Affected Environment**

Noise receivers/receptors in the study area consist of residential and commercial development, light industrial uses, and places of worship. The study area adjacent to SR 69 near the intersection of Prescott Lakes Parkway is moderately developed for commercial uses. The study area adjacent to SR 69 from Holiday Drive to Frontier Village is moderately developed, with businesses situated along SR 69 and residential developments behind them. The central portion of the study area is largely undeveloped open space. Existing noise sources affecting the study area include traffic noise associated with SR 69 and adjoining side streets, and the aircraft noise associated with Prescott Municipal Airport, which is approximately 6.5 miles north of the study area.

Approximately 150 residential receivers are within 1,000 feet of the study area. These residences are present on both sides of SR 69 between Holiday Drive and Frontier Village, and the nearest residences are set back approximately 200 feet from the roadway as shown in Figure 16 (Page 23). There are no residential receivers in the central and eastern portions of the study area between Holiday Drive and Prescott Lakes Parkway. There are no parks or recreation areas in the project vicinity.

**Environmental Concerns and Recommendations for Further Analysis**

A detailed noise analysis should be completed during the DCR/environmental analysis phase of project development. Widening the roadway from four to six lanes would increase capacity, which may potentially



increase traffic noise and impacts to sensitive receivers. Noise-sensitive receivers within 1,000 feet of the SR 69 study corridor would be modeled using the FHWA’s approved Traffic Noise Model version 2.5 (TNM2.5). In addition, the TNM2.5 would be used to validate field measurements.

Because future traffic noise impacts may occur as a result of the proposed project, noise abatement measures should be assessed for all affected noise-sensitive receivers. Due to the current set-back of residential receivers from SR 69 and the presence of commercial buildings (current and planned) fronting SR 69, noise impacts requiring mitigation are not anticipated. Noise analysis and modeling would be needed to confirm this preliminary evaluation. Typical noise abatement measures considered would include alteration of the roadway alignment, acquisition of right-of-way to provide buffer zones, traffic management measures (control devices and traffic/vehicle restrictions), and noise barriers (noise walls, noise berms, and combination wall/berms). If required, feasible and reasonable noise abatement measures would be recommended.

The City of Prescott has developed a code of ordinances and noise policies to protect sensitive land uses from temporary construction noise (City of Prescott 2014a). The city ordinance limits construction activities to between the hours of 6 a.m. and 8 p.m. Best management practices would be recommended, as necessary, for temporary construction-related noise impacts.

Minimal differences in noise would be generated by the three alternatives. Due to existing development on the west end of the project, all three alternatives would bring the roadway closer to residential receptors. Commercial property, both developed (U-Haul) and undeveloped, is situated between the residences and SR 69 in this location.

5.2.6. Air Quality

Affected Environment

Air quality is assessed at the regional and project level. The study area is under the jurisdiction of the EPA, the ADEQ, and the Central Yavapai Metropolitan Planning Organization (CYMPO).

Areas can be classified as non-attainment, attainment, or maintenance. Geographic areas that exceed National Ambient Air Quality Standards (NAAQS) for a criteria pollutant are considered “non-attainment” areas for that pollutant. Conversely, areas that are below a criteria pollutant standard are considered “attainment.” Maintenance areas are defined as previously exceeding the NAAQS (non-attainment) for a criteria pollutant but are currently attaining that standard. Maintenance areas are required to develop a maintenance plan outlining steps for continued attainment over the maintenance period.

The Clean Air Act (CAA) of 1970, which was last amended in 1990, is the federal law that governs air quality. The EPA is responsible for establishing NAAQS for each of six criteria pollutants to protect the public from the health hazards associated with air pollution. These six criteria pollutants are carbon monoxide (CO), ozone (O<sub>3</sub>), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), particulate matter less than 2.5 microns in diameter and less than 10 microns in diameter (PM<sub>2.5</sub> and PM<sub>10</sub>), and lead (Pb). The State of Arizona has adopted the NAAQS for these criteria pollutants. Pollutants typically associated with vehicle traffic are CO, O<sub>3</sub>, nitrogen oxides, and particulate matter (PM). Table 23 provides the NAAQS for criteria pollutants.

There are no non-attainment or maintenance air quality areas within or near the study area. This project would add capacity to SR 69 and require air quality conformity. Projects within an attainment /maintenance area must be included in the current fiscally constrained and air quality conforming Regional Transportation Plan and Transportation Improvement Plan. The analysis would be conducted through the CYMPO when the project is placed in a 5-Year Transportation Improvement Plan.

Table 23 – NAAQS for Criteria Pollutants

POLLUTANT/AVERAGING TIME	NATIONAL STANDARD
<b>Carbon monoxide (CO)</b>	
8-hour (primary)	9 ppm <sup>a</sup>
1-hour (primary)	35 ppm
<b>Lead (Pb)</b>	
Rolling 3-month average (primary and secondary)	0.15 µg/m <sup>3</sup>
<b>Nitrogen dioxide (NO<sub>2</sub>)</b>	
Annual arithmetic mean (primary and secondary)	53 ppb
1-hour (primary)	100 ppb
<b>Ozone (O<sub>3</sub>)</b>	
8-hour (primary and secondary)	0.075 ppm
<b>Particulate matter less than 10 microns (PM<sub>10</sub>)</b>	
24-hour (primary and secondary)	150 µg/m <sup>3</sup>
<b>Particulate matter less than 2.5 microns (PM<sub>2.5</sub>)</b>	
Annual (primary)	12 µg/m <sup>3</sup>
Annual (secondary)	15 µg/m <sup>3</sup>
24-hour (primary and secondary)	35 µg/m <sup>3</sup>
<b>Sulfur dioxide (SO<sub>2</sub>)</b>	
1-hour (primary)	75 ppb
3-hour (secondary)	0.5 ppm

ppm = parts per million; µg/m<sup>3</sup>= micrograms per cubic meter; ppb = parts per billion.

Source: EPA NAAQS (2011).

Mobile Source Air Toxics

In addition to the NAAQS for criteria air pollutants, the EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the CAA. MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

Section 202(l)(2) of the CAA requires the EPA to set emission standards to control air toxics from motor vehicles and motor vehicle fuels. Unlike the criteria pollutants for which the NAAQS are established, the CAA did not grant the EPA the authority to establish health-based ambient air quality standards for MSATs.

In addition there are no transportation conformity requirements for MSATs to ensure consistency between air toxic reduction efforts and the transportation planning process. However, the requirement of NEPA for federal agencies to consider the environmental consequences of their actions is broad and extends beyond the need to comply with other substantive environmental laws and regulations (FHWA 2012). Thus, though there are no ambient air quality standards or transportation conformity requirements for MSATs, MSATS are within the broader purview of NEPA and would be evaluated as the SR 69 project moves into the DCR/environmental documentation phase.

There are three categories of analysis:

1. No analysis for projects with no potential for meaningful MSAT effects;
2. Qualitative analysis for projects with low potential MSAT effects; and
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

This project falls into the second category because the projected future traffic volumes are less than 140,000 to 150,000 annual average daily traffic, and thus have low potential MSAT effects.

Environmental Concerns and Recommendations for Further Analysis

During the DCR/environmental documentation phase of the project, quantitative microscale air quality impacts would be evaluated using FHWA CAL3HQC model. The degrees of air quality impacts are contingent on the operational efficiency of each alternative. Factors such as traffic volume, level of service, intersection delay times, speed, percent heavy truck, and directional flow influence the modeling. All three build alternatives would have similar results because the alternatives retain the current alignment of SR 69 and include the same capacity improvements. In general, it would be expected that the build alternatives would result in improved air quality due to higher level of service offered by the six-lane roadway versus the current congested four-lane roadway.

**5.2.7. Hazardous Materials**

Hazardous materials are regulated by the EPA pursuant to the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act. The regulation and administration of hazardous materials, incidents, and databases is the responsibility of the ADEQ and the EPA. A background review of federal and state hazardous materials databases was completed for the project (Allands 2014). The purpose of the background review was to evaluate and identify the presence of hazardous materials or similar environmental concerns that may adversely affect the project. This effort included a review of recent aerial photography and an evaluation of a study area database search.

Affected Environment

The database search for the study area revealed six underground storage tank (UST) locations, five leaking UST sites, and two RCRA sites in the vicinity of the study corridor. No landfills are known to be located in the study area and no other facilities that would be of concern for the presence of hazardous or regulated materials appear in the database.

None of the leaking UST cases remain open; all were closed by the ADEQ between 1986 and 2000. All former leaking UST facilities were granted regulatory case closure when their subsurface soils were mitigated to meet the state risk-based correction action levels.

Environmental Concerns and Recommendations for Further Analysis

No hazardous materials issues are known within the current ADOT right-of-way or the immediately adjacent properties. Though several properties adjacent to SR 69 use or contain hazardous or regulated materials, none currently is subject to any remediation activity. There are no known hazardous materials sites or incidents that would pose a significant obstacle to project development or any alternative. A more detailed evaluation based on specific right-of-way needs should occur during the DCR/environmental documentation phase of project development. This would include preparation of a Preliminary Initial Site Assessment and analysis of potential lead-based paint and asbestos-containing materials.

**5.2.8. Section 4(f) and 6(f) Resources**

Section 4(f) of the U.S. Department of Transportation Act of 1966 states that the Secretary of Transportation:

“...may approve a transportation program or project ... requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, state, or local significance, or land of an historic site of national, state, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if ... there is no prudent and feasible alternative to using that land and the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use” (49 U.S.C. 303[c]).

A “use” of a Section 4(f) resource, as defined in CFR Title 23, Part 771.135(p) occurs:

- a) when property is permanently incorporated into a transportation facility;
- b) when there is a temporary occupancy of land that is adverse in terms of the statute’s preservation purpose; or
- c) when there is a constructive use of a Section 4(f) property.

A constructive use of a Section 4(f) resource occurs when the transportation project does not incorporate land from a Section 4(f) resource but the project’s proximity impacts are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired. For example, a constructive use can occur when:

- a) the projected noise level increase attributable to the project substantially interferes with the use and enjoyment of a noise-sensitive facility of a property protected by Section 4(f);
- b) the proximity of the proposed action substantially impairs aesthetic features or attributes of a property protected by Section 4(f), where such features or attributes are considered important contributing elements to the value of the property. Examples of such an effect would be the location of a proposed transportation facility in such proximity that it obstructs or eliminates the primary views of an architecturally significant historical building, or substantially detracts from the setting of a Section 4(f) property which derives its value in substantial part due to its setting; or
- c) the project results in a restriction of access which substantially diminishes the utility of a significant publicly owned park, recreation area, or historic site.

A historic site is considered a Section 4(f) property if it is eligible for the National Register of Historic Places (NRHP) under Criterion A, B, or C if the site (A) is associated with events that have made a significant contribution to the broad patterns of our history, (B) is associated with the lives of persons significant in our past, or (C) embodies the distinctive characteristics of a type, period, or method of construction, or that

represent the work of a master, or that possess high artistic values, or that represent a significant distinguishable entity whose components may lack individual distinction.

The Land and Water Conservation Fund Act (LWCFA) of 1965 regulates user fees at certain recreational areas and establishes a fund in the U.S. Department of the Treasury to subsidize governmental acquisition of lands and waters for recreational and conservation purposes (16 U.S.C. 460I-4 et seq.). Under Section 6(f) of the LWCFA, any conversion to non-recreational uses for recreational lands and waters that used LWCFA funds during facility acquisition, establishment, or improvements requires the prior approval of the National Park Service and Arizona State Parks.

Affected Environment

The study area was reviewed for historic sites, publicly owned parks, recreation areas, and wildlife or waterfowl refuges protected under Section 4(f). The study area, which includes a ¼-mile buffer, accounts for potential constructive use impacts (i.e., noise and visual) that may extend outside of the study area. No parks, recreation areas, or wildlife or waterfowl refuges are in the study area. The nearest park/recreation areas are the City of Prescott Whipple Park about 2 miles east and Watson Woods Riparian Preserve about 4.5 miles north. The Prescott Bicycle and Pedestrian Master Plan (City of Prescott 2014b) includes a recommended bike and/or pedestrian path along SR 69 from the east city limits to Pioneer Parkway and Gateway Mall. Currently, there are no existing trails in the project area.

There are no cultural resource sites that have been determined eligible for the NRHP under Criterion A, B, or C. SR 69 has been determined eligible under Criterion D. There is one artifact scatter identified in proximity to the study area near Prescott Canyon Drive. This site has not been evaluated for eligibility. General Land Office (GLO) maps identify several historic roads that formerly crossed SR 69 in the eastern half of the project. These roads have not been evaluated for eligibility.

Environmental Concerns and Recommendations for Further Analysis

The unevaluated artifact scatter near Prescott Canyon Drive may be in close enough proximity to warrant further analysis. Alternatives to widen symmetrically and widen to the north would shift the roadway closer to this site, while the alternative to widen to the south would not be expected to encroach on the site. The historic roads listed on GLO maps no longer exist and are not protected as Section 4(f) properties. Further study in the DCR/environmental documentation for cultural resources and consultation through the Section 106 process would occur to confirm the presence or lack of Section 4(f) historic resources. There are no parks, recreation areas or refuges in proximity to the project. The build alternatives all include an eight-foot-wide multi-use path on either the north or south side of SR 69.

**5.3 Socioeconomic Environment**

**5.3.1 Land Use, Ownership, and Jurisdiction**

Affected Environment

The study area is in the city of Prescott, Arizona. The adjacent lands are privately owned, with the exception of lands administered by ASLD and the Yavapai-Prescott Indian Tribe shown in Figure 16 (Page 23). Nearby jurisdictions include the town of Prescott Valley three miles northeast and the town of Chino Valley ten miles north of the study area.

Land use planning in the study area is the responsibility of the City of Prescott as described in the *2014 Prescott General Plan, A Community Vision* (City of Prescott, 2014c). The *Yavapai County Comprehensive Plan* (Yavapai County, 2014b) also provides planning tools for growth and development in the study area and the surrounding region. These plans and ALRIS (2014) were used to determine existing land

ownership as well as representative existing and proposed future land uses within and adjacent to the study area.

Existing land uses were verified using current Yavapai County and City of Prescott planning data and aerial photography of the study area. Land uses along SR 69 throughout the study area are a mix of commercial development and undeveloped land. Residential developments are on the north and south sides of SR 69 toward the west end of the study area. These residential areas are set back from SR 69 behind the commercially developed areas shown in Figure 16 (Page 23).

Commercial development occurs on both sides of SR 69 on the east end with the Prescott Gateway Mall, a large retail complex. The west end of the project area includes the commercial Frontier Village on the Yavapai-Prescott Indian Tribe lands and commercial development on the north and south side of SR 69 east to the Prescott city limits boundary. Residential property is north and south of SR 69 behind the commercial properties. Undeveloped lands occur on a large central portion of the project coincident to the ASLD property. There are currently no development plans for the ASLD land; however, the City of Prescott has indicated to the ASLD its intention to consider future acquisition of state lands within its municipal planning area.

The City of Prescott future land use plans indicate that the project corridor falls within planned commercial zones on the east and west ends, with a recreation/open space designation through a portion of the ASLD lands (City of Prescott, 2014c). A bike and/or pedestrian path is planned by the city within the study area.

Environmental Concerns and Recommendations for Further Analysis

The planned improvements identified for SR 69 would not alter land use or jurisdiction. Minor right-of-way acquisition would occur from private owners and a right-of-way grant may be needed from the Yavapai-Prescott Indian Tribe for a multi-use path. Each build alternative includes a multi-use path on the north or south side of SR 69 consistent with the city’s future plans. Access to adjacent lands would not be altered with the project. The Widen SR 69 to the North alternative would have the greatest right-of-way impact at 1.5 acres and the Widen SR 69 to the South alternative would have the least, at 0.30 acre. No right-of-way acquisition would require the displacement or relocation of any developed property.

During the DCR/environmental documentation phase of the project, design refinement might change the actual right-of-way requirements, but it would not be expected to result in a substantive change in right-of-way needed.

**5.3.2 Socioeconomics**

Affected Environment

The study area is primarily within the City of Prescott. The far western end of the project falls within the Yavapai-Prescott Indian Tribe reservation boundary. The city population based on the 2010 census was 38,843, with a growth rate since 1995 of about 2 percent. The Yavapai County population in the 2010 census was 131,406. Projected population for the city and county, respectively, by 2030 is 62,245 and 220,905 (CYMPO 2012). Primary employment sectors include government, retail, tourism, education, health care, manufacturing, and construction. The retail employment element is well represented in the study area.

The residential neighborhoods in the study area are north and south of SR 69 at the west end of the project, separated by the roadway and commercial development. No social and public services – police, fire, hospitals and schools – are located in the study area. The nearest police and fire services are about 3 miles west at the Prescott Fire Department on White Spar Road and the Yavapai County Sheriff’s Office on Gurley Street. The Veterans Administration Medical Center is about 1.5 miles west on the Yavapai-Prescott

Indian Tribe land, and Yavapai Regional Medical Center is about 5 miles west on Willow Creek Road. Yavapai College is 1.5 miles west on Sheldon Street. Elementary, middle, and high schools are 2.5 to 7 miles west of the project area. A charter school is at the Calvary Chapel Church on Holiday Drive south of SR 69.

Environmental Concerns

The SR 69 improvements would not result in any developed property acquisitions. No impacts would be expected to employment other than temporary hires for roadway construction activities. The improved traffic operations would benefit the commercial/retail businesses through reduced traffic delay times. The improvements identified in the Feasibility Study for SR 69 would not be expected to represent a major economic impact in the corridor. Neighborhood continuity impacts would not appreciably increase compared with the existing condition. No social services facilities are in near proximity to the project area. The three build alternatives would have similar potential impacts, limited negative impacts related to temporary construction activities, and long-term positive benefits through improved traffic operations.

As with any major construction projects, access during and after construction is likely to be of primary concern to residents and business owners. The Prescott Fire Department noted the importance of maintaining emergency vehicle access during construction (Appendix C). An effective public and business community involvement program is critical to minimize issues and assist businesses.

**5.3.3. Title VI/Environmental Justice**

Title VI of the Civil Rights Act of 1964 and related statutes ensure that individuals are not excluded from participation in, denied the benefit of, or subjected to discrimination under any program or activity receiving federal financial assistance on the basis of race, color, national origin, age, sex, and disability. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, which was signed by President Clinton on February 11, 1994, directs that programs, policies, and activities identify and address, as appropriate, disproportionately high and adverse human health and environmental effects on minority and low-income populations.

Table 24 summarizes the demographic data obtained from the US Census Bureau, 2009-2013 American Community Survey 5-Year Estimate (U.S. Census Bureau 2014) for the block groups of interest, the City of Prescott, and Yavapai County as a whole. Demographic data are included for racial and ethnic groups, total minority populations, persons 60 and older, disabled persons, persons living below the poverty level, and the number of households with a female head of household with children younger than 18. For environmental justice evaluations, a racial or ethnic minority population is an aggregate composed of the following categories: Black/African American, American Indian and Alaska Native, Asian, Native Hawaiian and Other Pacific Islander, Other Races, Two or More Races, and Hispanic. Table 24 provides a breakdown of the percentage of each minority population category in each of the selected block groups and lists the aggregate of these minority populations.

Affected Environment

Two census tracts (CT) are in the study area, with SR 69 as the dividing line between the tracts. CT 5 is north of SR 69 and includes individuals with the Yavapai-Prescott Indian Tribe. CT 8.02 is south of SR 69. The census data indicate that minority populations, persons 60 or older (elderly residents), persons with disabilities, persons living below the poverty level, and households with a female head of household with children younger than 18 reside in the selected CTs (Table 24). The percentages of these populations reflect concentrations that are lower than, similar to, or only moderately higher than those of the comparison populations of Prescott and Yavapai County. The only exception is the percentage of elderly residing in CT 8.02. The 44.1 percent elderly population is meaningfully higher than the 34.3 percent county average.

Environmental Concerns and Recommendations for Further Analysis

The planned improvements would not create a disproportionate impact on any group and would benefit all populations. The future DCR/environmental documentation phase would allow meaningful participation in the project development process by all residents, including low-income and minority populations.

**5.3.4. Visual Resources**

Affected Environment

The visual character of the study area varies from a highly developed urban setting in the west half of the project, to an undeveloped mostly natural setting in the middle, and an urban setting on the east end. No designated scenic roads/byways or land management agency visual analysis requirements apply to the study area. Views outside the study area include the Yavapai Hills to the north and the Bradshaw Mountains in the Prescott National Forest to the south. The central portion of the study area is open with views of rolling hills covered in trees, shrubs and grasses. Both ends of the study area are dominated by commercial buildings.

Environmental Concerns and Recommendations for Further Analysis

The proposed SR 69 widening is consistent in scope and scale with the current transportation facility and adjacent land uses. The project area is about one mile from the Prescott National Forest boundary. Visual impacts to the national forest would not be expected. The widening would result in new surface excavation, vegetation removal, and placement of guardrail in some sections. This would slightly detract from current views by motorists. The Widen SR 69 Symmetrically and the Widen SR 69 to the South alternatives would require retaining walls for a short segment (about 160 feet). The height of the walls has not been determined at this stage of project development. In general, impacts to visual resources would not be a substantive factor in determining viability of the SR 69 improvements in the study area.

**5.3.5. Right-of-Way**

Affected Environment

The existing ADOT right-of-way and easements from the Yavapai-Prescott Indian Tribe and ASLD vary in width over the length (approximately 1 mile) of the project. The eastern segment varies from 250 feet to 300 feet in width. From approximately the midpoint of the project west to the Yavapai Connector, the right-of-way and easements are 200 feet wide. Adjacent land is privately owned, managed by the ASLD, or on Yavapai-Prescott Indian Tribe lands.

Environmental Concerns and Recommendations for Further Analysis

Detailed analysis of right-of-way needs would occur in the DCR/environmental documentation phase. All new right-of-way would appear to be privately owned, require an easement from the ASLD, or a grant from the Yavapai-Prescott Indian Tribe. The right-of-way requirements of the three build alternatives vary from 0.30 acre to 1.50 acres. The minor amounts of right-of-way needed are not expected to be a major factor in the alternative selection or design considerations.

A grant of right-of-way from the Yavapai-Prescott Indian Tribe would require action by the Bureau of Indian Affairs (BIA) due to a transfer of tribal trust lands as an easement to ADOT. This action requires compliance with NEPA. Coordination with the BIA Western Regional Office indicates that the NEPA process typically followed by FHWA/ADOT would satisfy BIA requirements (Appendix C, Record of Conversation).



Table 24 – Total Minority, Ages 60 or Older, Below Poverty Level, Disabled, and Female Head of Household Populations

AREA	TOTAL POPULATION	TOTAL MINORITY <sup>a</sup>		AGES 60 OR OLDER		TOTAL POPULATION FOR WHOM DISABLED IS DETERMINED	DISABLED		TOTAL POPULATION FOR WHOM POVERTY IS	BELOW POVERTY LEVEL		HOUSEHOLDS	FEMALE HEAD OF HOUSEHOLD	
		#	%	#	%		#	%		#	%		#	%
Census Tract 5	5,298	427	8.1	1,881	35.5	5,298	964	18.2	5,298	670	12.6	2,355	117	5.0
Census Tract 8.02	3,278	153	4.7	1,446		3,278	527	16.1	3,278	349	10.6	1,697	140	8.2
City of Prescott	40,003	3,220	8.0	16,401	41.0	39,203	6,732	17.2	38,415	5,800	15.1	18,592	1,561	8.4
Yavapai County, Arizona	211,968	17,099	8.1	72,705	34.3	210,256	37,309	17.7	208,864	33,026	15.8	91,349	8,043	8.8

Source: U.S. Census Bureau, 2009-2013 American Community Survey 5-Year Estimate.

# = Number, % = Percentage, BG = Block Group, CT = Census Tract.

Bolded item denotes population that is meaningfully higher than the comparison populations.

<sup>a</sup> “Total Minority” is composed of all people who consider themselves Non-White racially plus those who consider themselves White Hispanic.

5.3.6 Utilities

Affected Environment

The study area contains the full range of utilities expected in an urban community: water, wastewater, above- and below-ground power, above- and below-ground communications, and fuel oil/gas. Major utilities include:

- Electric power - Arizona Public Service
- Gas - Unisource Energy and Southern Union Gas
- Water - City of Prescott and Holiday Hills Water District
- Communications - Cable One, CenturyLink, Group W Cable

Environmental Concerns and Recommendations for Further Analysis

Any improvements in the SR 69 corridor would involve multiple utilities. During the DCR/environmental documentation phase, additional investigation into the degree of impacts and any needed relocation or service interruptions would be evaluated. Coordination with utility companies would occur during this phase. Each of the three build alternatives would potentially affect an overhead fiber optic cable west of Prescott Canyon Drive.

5.4 Cultural Resources

Cultural resources are properties that reflect the heritage of local communities, states, and nations. Properties judged to be significant and to retain sufficient integrity to convey that significance are termed “historic properties” and are afforded certain protection in accordance with state and federal legislation. The National Historic Preservation Act (NHPA) of 1966, as amended, defines historic properties as sites, buildings, structures, districts (including landscapes) and objects included in, or eligible for inclusion in, the NRHP, as well as the artifacts, records, and remains related to such properties. Traditional cultural properties having heritage value for contemporary communities (often, but not necessarily, Native American groups) also can be determined eligible for, and listed in, the NRHP because of their association with historic cultural practices or beliefs that are important in maintaining the cultural identities of such communities.

Section 106 of the NHPA requires federal agencies (in this case, the FHWA assisted by ADOT) to consider the potential effects of their undertakings on historic properties. Effects can be direct and result in physical alteration to the property, or indirect, as when the characteristics that qualify the property for NRHP listing are altered as a result of visual, auditory, or atmospheric intrusions.

To be considered eligible for listing in the NRHP, a property must meet at least one of the following criteria:

- Is associated with events that have made a significant contribution to the broad patterns of our history
- Is associated with the lives of persons significant in our past
- Embodies the distinctive characteristics of a type, period, or method of construction or that represents the work of a master, or that possesses high artistic values, or that represents a significant distinguishable entity whose components may lack individual distinction
- Has yielded, or may be likely to yield, information important in prehistory or history

Archival research and record searches were conducted at the ADOT Historic Preservation Portal, the GLO plats, and the AZSITE cultural resource database to identify surveys and recorded or suspected cultural

resources in the study area. Information regarding previous surveys or cultural resources on the westernmost portion of the study area was not available because it is situated on Yavapai-Prescott Indian Tribe land.

Affected Environment

Research identified four cultural resources, summarized in Table 25, and 11 prior cultural resource investigations, summarized in Table 26, in the study area. Prior cultural resource inventories have covered approximately 85 percent of the current study area; however, all but one of these surveys were conducted more than 10 years ago and might require re-survey.

Cultural resources in the study area include a prehistoric archaeological site, historic-age roads, and a historic artifact scatter, shown in Table 25. EcoPlan coordinated with Andy Christensen, Ph.D., an independent archaeological consultant, with respect to the site identified as a historic artifact scatter near Prescott Canyon Drive (AZ N:7:171 [ASM]). Christensen consolidated multiple site records from that location into the single AZ N:7:171 (ASM) site file in 2005. A traditional cultural property is also located near the SR 69 project location. Scott Kwiatkowski of the Yavapai-Prescott Indian Tribe cultural resource office confirmed that it is outside the current project limits.

Table 25 - Previously Recorded Cultural Resources in the Study Area

SITE NAME/ NUMBER	DESCRIPTION	NRHP STATUS <sup>1</sup>	REFERENCE
AZ N:7:171 (ASM)	Artifact scatter with associated features	Unevaluated	Christenson 2007
AZ N:7:339 (ASM)	Historic trash scatter and rock cairn	Recommended not eligible	Christenson 2002
SR 69	Historic road	Determined eligible, Criterion D	Interim Procedures 2002 <sup>2</sup>
GLO Roads	Historic road	Unevaluated	GLO maps

<sup>1</sup> An eligible property may include contributing and noncontributing elements. Consultation has not yet taken place for cultural resource identified as “recommended” eligible or not eligible. Some properties in the project area have never been formally evaluated.

A property must meet at least one of the following criteria in order to qualify for listing in the NHPA:

- A: Is associated with events that have made a significant contribution to the broad patterns of our history
- B: Is associated with the lives of persons significant in our past
- C: Embodies the distinctive characteristics of a type, period, or method of construction that represents the work of a master, of that possess high artistic values, or that represents a significant distinguishable entity whose components may lack individual distinction
- D: Has yielded, or may be likely to yield, information important in prehistory or history

<sup>2</sup> *Interim Procedures for the Treatment of Historic Roads* November 15, 2002. Agreement among FHWA, ADOT, and the State Historic Preservation Office.

**Table 26 – Prior Cultural Resource Investigations in the Study Area**

NO.	PROJECT NUMBER	DESCRIPTION	REFERENCE
1	1983-180.ASM BLM-020-14-168	Prescott Valley Widening of SR 69	Rosenberg 1983
2	1987-9.ASM	ADOT Prescott–Prescott Valley Survey	Heacock 1987
3	1987-12.ASM	Underground Cable Realignment	Macnider 1987
4	1989-66.ASM	The Ranch at Prescott	Euler 1989
5	1997-166.ASM	69/89 Connector	Dickie 1997
6	1997-260.ASM	69/89 Connector–6 Acre Survey	Christenson 1997
7	1999-482.ASM	Prescott Mall Project I	Larkin, et al. 1999
8	2002-206.ASM	SR 69 MP 292.8-MP 295	AZSITE 2014
9	2002-403.ASM	Gateway West	Christenson 2002
10	2007-727.ASM	Creative Enterprises Prescott	AZSITE 2014
11	N/A	Soil Storage Site Survey	Terhune 2003

#### Environmental Concerns and Recommendations for Further Analysis

In sum, the inventory of known and suspected cultural resources on or within 300 feet of SR 69 includes three cultural resources and the GLO-mapped roads. The unevaluated artifact scatter near Prescott Canyon Drive may be in close enough proximity to warrant further analysis. The Widen SR 69 Symmetrically and the Widen SR 69 to the North alternatives would shift the roadway closer to this site, while widening to the south would not encroach on the site. The historic roads listed on GLO maps no longer exist. Further study in the DCR/environmental documentation for cultural resources and consultation through the Section 106 process would occur to confirm effects or lack of effect on cultural resources.

As project planning progresses, additional cultural resources inventory and survey may be required within the area of potential effects. Due to the age of previous surveys, the project area will require a resurvey per ADOT guidance. Efforts to arrive at definitive eligibility assessments, including assessing whether or not the portions of eligible properties subject to potential effect are contributing elements of the properties as a whole, will be required. When the project advances to the DCR/environmental documentation phase, the FHWA (assisted by ADOT) would need to determine what effect construction of that alternative will have on historic properties.

If eligible properties will be affected, mitigation measures will need to be developed and implemented prior to construction. Such measures can include data recovery of archaeological sites and archival research and photographic documentation of historic structures.

The Section 106 compliance process for this undertaking would include the following agencies and tribes:

- ADOT
- FHWA
- ASLD

- City of Prescott
- Yavapai County
- Yavapai-Prescott Indian Tribe
- Yavapai-Apache Nation
- Hualapai Tribe
- Salt River Pima-Maricopa Indian Community
- Hopi Tribe
- Gila River Indian Community
- Tohono O’odham Nation
- Ak-Chin Indian Community

#### **5.5 Coordination**

The Feasibility Study and the EO for SR 69 (Prescott Lakes Parkway to Frontier Village) were conducted in concert. Coordination with stakeholder agencies and team progress meetings were jointly held throughout the process.

##### **5.5.1 Agency/Stakeholder Coordination**

The project kickoff meeting was held on September 9, 2014, at the ADOT Prescott District Office. Participants included representatives from:

- FHWA
- ADOT
- CYMPO
- City of Prescott

Subsequent team meetings were held on a monthly basis at the ADOT Prescott District Office, with an audio link option to participate remotely. Throughout the course of the meetings, additional stakeholder participants included:

- Yavapai-Prescott Indian Tribe
- Yavapai County
- ASLD

The meetings were chaired by the ADOT Project Manager and Stanley Consultants, Inc. Agenda items varied for each meeting, with a focus on soliciting input from the stakeholders. Presentations to the stakeholders provided data and graphics depicting existing conditions, operational issues, traffic modeling/forecasts, alternatives development, and environmental resource issues.

A scoping letter was sent to local, state, and federal agencies that have jurisdiction or interest in the project on October 30, 2014. The letter provided a general description of the proposed SR 69 improvements, a project area map, and a request to identify any issues or concerns. The mailing list and example letter are located in Appendix A. Responses were received from the AGFD, the Prescott Fire Department, and the Yavapai County Flood Control District. Response letter and emails are in Appendix C.



5.5.2 Public Involvement

A public involvement meeting will be deferred to the DCR/environmental documentation phase.

5.6 Environmental Overview Conclusion

The evaluation of social, economic, and environmental resources in the study area did not identify any substantive issues that would affect the selection of a viable alternative in the Feasibility Study. Specifically, the EO analysis concludes there are no “fatal flaw” impacts on social, economic, and environmental resources known for the study area. Impacts would be expected to be minor and within the normal range expected with a roadway widening project.

The potential impacts noted included:

- Minor vegetation removal (see Chapter 5.2.2)
- Increased potential impacts to wildlife crossings of SR 69 (see Chapter 5.2.3)
- Encroachment on two potential Waters requiring Clean Water Act permits (see Chapter 5.2.4)
- Minor right-of-way acquisition from private property owners and the ASLD (less than 1.5 acres) (see Chapter 5.3.5)
- Need for a right-of-way grant from the BIA for a multi-use path on Yavapai-Prescott Indian Tribe lands (see Chapter 5.3.5)
- Typical construction impacts to utilities (see Chapter 5.3.6)
- Potential encroachment on a cultural resource site (see Chapter 5.4)

Further consideration of potential impacts would occur in the DCR/environmental documentation phase, when more detailed analysis, stakeholder participation, and development of mitigation measures would occur. The process would follow NEPA (42 U.S. Code 4321–4347) (NEPA 1970), as implemented by the Council on Environmental Quality (CFR Title 40, Part 1508.8), and FHWA guidelines (CFR Title 23, Part 771).

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## 6.0 Itemized Estimate of Probable Costs

Estimates of probable construction cost (2014 dollars) for the recommended alternative, Widen to the North, are shown below. A detailed estimate of probable cost is shown on the following page. The estimated costs are based upon unit prices from ADOT's Construction Cost Data Base and recent bid data.

The estimated cost for construction of the widening SR 69 within the project limits is \$6,819,000. The ADOT Roadway Predesign Section recommends a future construction budget amount of \$10,000,000.

The following assumptions were used for the cost estimate:

- The pavement structural section used for the widening was 7.5 inches of asphaltic concrete (AC) on 20 inches of aggregate base (AB) (Class 2) based on recent projects in the area.
- The existing roadway pavement will not be removed and reconstructed. However, ½ inch AR-ACFC will be applied to the entire roadway after widening.
- Estimated costs for the new R/W acquisition for the project are included (\$8/square foot). TCEs are estimated at \$100 each.
- Clearing and grubbing includes removal of trees.
- Utility relocations will be required. Costs were estimated at 5% of the construction subtotal.
- All culverts are extended to the appropriate clear zone requirements.
- The total cost for each size of box culvert extension was computed.
- Costs for the traffic signal item includes removal of the existing equipment and new replacements for poles, mast arms, signal heads, lights, crossroad signs, conduit, and conductors.
- Structural backfill costs were included in the cost of the drainage elements and other structure related items.
- The estimated costs do not include additional costs that may be incurred by implementing the project in phases.
- Cost items associated with earthwork may vary substantially from those to be calculated in final design, when a detailed geotechnical investigation will be conducted.
- All disturbed areas will be seeded.
- Asphaltic Concrete smoothness incentive (\$9,000/lane mile) was used.
- Asphaltic Concrete material quality incentive (\$3.00/ton) was used.
- The estimated cost for final design includes the environmental clearance and geotechnical investigation and analyses.



Table 27 – Estimate of Preliminary Cost – Widen to the North Alternative

ESTIMATE OF PROBABLE CONSTRUCTION COST SR 69, Prescott Lakes Parkway to Frontier Village					
ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
2010011	CLEARING AND GRUBBING	ACRE	4	\$ 900.00	\$ 3,600
2020020	REMOVAL OF CONCRETE CURB	L.FT.	248	\$ 4.00	\$ 992
2020021	REMOVAL OF CONCRETE CURB AND GUTTER	L.FT.	1,805	\$ 5.00	\$ 9,025
2020025	REMOVAL OF CONCRETE SIDEWALKS, DRIVEWAYS AND SLABS	SQ.FT.	2,395	\$ 2.50	\$ 5,988
2020036	REMOVAL OF ASPHALTIC CONCRETE PAVEMENT	SQ.YD.	5,063	\$ 5.00	\$ 25,315
2020038	REMOVAL OF ASPHALTIC CONCRETE PAVEMENT (0" TO 2")	SQ.YD.	31,562	\$ 2.00	\$ 63,124
2020041	REMOVAL OF PIPE	L.FT.	580	\$ 20.00	\$ 11,600
2020071	REMOVE GUARD RAIL	L.FT.	1,835	\$ 2.50	\$ 4,588
2020080	REMOVE BITUMINOUS PAVEMENT (MILLING) (1/2")	SQ.YD.	40,621	\$ 1.50	\$ 60,932
2020153	REMOVE (EXISTING TRAFFIC SIGNAL)	L. SUM	1	\$ 10,000.00	\$ 10,000
2020156	REMOVE (HEADWALL)	EACH	1	\$ 500.00	\$ 500
2020159	REMOVE (CATCH BASIN)	EACH	4	\$ 500.00	\$ 2,000
2020201	SAW CUTTING	L.FT.	5,870	\$ 2.00	\$ 11,740
2030301	ROADWAY EXCAVATION	CU.YD.	12,000	\$ 8.00	\$ 96,000
2030507	COMPACTED BACKFILL (DRAINAGE DITCH)	CU.YD.	2,520	\$ 8.00	\$ 20,160
2030900	BORROW (IN PLACE)	CU.YD.	7,000	\$ 10.00	\$ 70,000
3030022	AGGREGATE BASE, CLASS 2	CU.YD.	6,297	\$ 35.00	\$ 220,395
4040111	BITUMINOUS TACK COAT	TON	32	\$ 575.00	\$ 18,400
4040116	APPLY BITUMINOUS TACK COAT	HOURL	56	\$ 125.00	\$ 7,000
4040270	ASPHALT BINDER (PG 70-10)	TON	233	\$ 550.00	\$ 128,150
4140040	ASPHALTIC CONCRETE FRICTION COURSE (ASPHALT-RUBBER)	TON	2,131	\$ 50.00	\$ 106,550
4140042	ASPHALT RUBBER MATERIAL (FOR AR-ACFC)	TON	203	\$ 675.00	\$ 137,025
4140044	MINERAL ADMIXTURE (FOR AR-ACFC)	TON	20	\$ 90.00	\$ 1,800
4160004	ASPHALTIC CONCRETE (3/4" MIX) (END PRODUCT) (SPECIAL MIX)	TON	4,654	\$ 50.00	\$ 232,700
4160031	MINERAL ADMIXTURE	TON	45	\$ 90.00	\$ 4,050
5011025	PIPE, REINFORCED CONCRETE, CLASS V, 24"	L.FT.	233	\$ 85.00	\$ 19,805
5012524	STORM DRAIN PIPE, 24"	L.FT.	1,425	\$ 60.00	\$ 85,500
5014524	FLARED END SECTION, 24" (C-13.20 OR C-13.25) (PIPE CULVERT)	EACH	2	\$ 400.00	\$ 800
5030023	CONCRETE CATCH BASIN (C-15.20) ONE 7.5' WING, H=8' OR LESS	EACH	2	\$ 5,000.00	\$ 10,000
5030027	CONCRETE CATCH BASIN (C-15.20) ONE 19.5' WING, H=8' OR LESS	EACH	5	\$ 6,000.00	\$ 30,000
5041901	CONCRETE STRUCTURE (CUTOFF WALL)	EACH	1	\$ 2,000.00	\$ 2,000
5050013	MANHOLE (C-18.10) (FOR PIPES 6" TO 36")	EACH	2	\$ 3,000.00	\$ 6,000
8050003	SEEDING (CLASS II)	ACRES	5	\$ 3,000.00	\$ 15,000
9050001	GUARD RAIL, W-BEAM, SINGLE FACE	L.FT.	3,000	\$ 16.00	\$ 48,000
9050036	GUARD RAIL, ANCHOR ASSEMBLY	EACH	7	\$ 500.00	\$ 3,500
9050040	GUARD RAIL, END TERMINAL ASSEMBLY	EACH	1	\$ 1,000.00	\$ 1,000
9080001	CONCRETE CURB (C-05.10) (TYPE A)	L.FT.	200	\$ 28.00	\$ 5,600
9080086	CONCRETE CURB AND GUTTER (C-05.10) (TYPE D)	L.FT.	6,000	\$ 20.00	\$ 120,000
9080201	CONCRETE SIDEWALK (C-05.20)	SQ.FT.	50,000	\$ 5.00	\$ 250,000
9080296	CONCRETE SIDEWALK RAMP (C-05.30) (TYPE B)	EACH	7	\$ 1,300.00	\$ 9,100
9080301	CONCRETE DRIVEWAY (C-05.20)	SQ.FT.	962	\$ 10.00	\$ 9,620
9080512	SCUPPER	EACH	5	\$ 1,800.00	\$ 9,000
9130001	RIPRAP (DUMPED)	CU.YD.	465	\$ 70.00	\$ 32,550
9210011	MEDIAN PAVING	SQ.YD.	100	\$ 100.00	\$ 10,000
9240050A	MISCELLANEOUS WORK (RCB CULVERT) (EXTEND 10'x8' SR 69 STA 4898+00)	L.SUM	1	\$ 45,786.00	\$ 45,786
9240050B	MISCELLANEOUS WORK (RCB CULVERT) (NEW 8'x8' SR 69 STA 4921+42)	L.SUM	1	\$ 232,958.00	\$ 232,958
9240050C	MISCELLANEOUS WORK (RCB CULVERT) (EXTEND 2-8'x7' SR 69 STA 4929+27)	L.SUM	1	\$ 25,026.00	\$ 25,026
60700XX	SIGNING	L.SUM	1	\$ 40,000.00	\$ 40,000
70800XX	PAVEMENT MARKING	L.SUM	1	\$ 30,000.00	\$ 30,000
73300XX	TRAFFIC SIGNAL	L.SUM	1	\$ 300,000.00	\$ 300,000
DETAILED ESTIMATE SUBTOTAL					\$ 2,592,879
934XX01	MISCELLANEOUS WORK (15%)	COST	15.00%	\$	\$ 389,000
Subtotal 1					\$ 2,981,879
2090005	FURNISH WATER (1%)	COST	1.00%	\$	\$ 30,000
7010003	MAINTENANCE AND PROTECTION OF TRAFFIC (15%)	COST	15.00%	\$	\$ 448,000
810XX01	EROSION CONTROL AND POLLUTION PREVENTION (1%)	COST	1.00%	\$	\$ 30,000
9240170	CONTRACTOR QUALITY CONTROL (2%)	COST	2.00%	\$	\$ 7,000
9250001	CONSTRUCTION SURVEYING AND LAYOUT (1%)	COST	1.00%	\$	\$ 30,000
Subtotal 2					\$ 3,526,879
9010001	MOBILIZATION (10%)	COST	10.0%	\$	\$ 353,000
Subtotal 3					\$ 3,879,879
951X001	CONSTRUCTION ENGINEERING (15%)	COST	15.00%	\$	\$ 582,000
951X002	CONSTRUCTION CONTINGENCY (5%)	COST	5.00%	\$	\$ 194,000
951X010	INDIRECT COST ALLOWANCE (10.39%)	COST	10.39%	\$	\$ 402,000
970Z020	PUBLIC RELATIONS	L.SUM	\$ 100,000	\$	\$ 100,000
DETAILED ESTIMATE					\$ 5,157,879

ITEM NO.	ITEM DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
416X001	ASPHALTIC CONCRETE (3/4" MIX) SMOOTHNESS INCENTIVE	LANE-MILE	6	\$ 9,000.00	\$ 54,000
416X002	ASPHALTIC CONCRETE (3/4" MIX) MATERIALS QUALITY INCENTIVE	TON	4,654	\$ 3.00	\$ 13,962
				PROJECT WIDE	\$ 68,000
FINAL DESIGN, ENVIRONMENTAL CLEARANCE COSTS (15%)		COST	15.00%	\$	\$ 774,000
RIGHT-OF-WAY		SQ.FT.	64,800	\$ 8.00	\$ 519,000
UTILITY RELOCATIONS (5%)		COST	5.00%	\$	\$ 300,000
				OTHER COSTS	\$ 1,593,000
SUMMARY					
				DETAILED ESTIMATE	\$ 5,158,000
				PROJECT WIDE	\$ 68,000
				OTHER COSTS	\$ 1,593,000
				TOTAL CONSTRUCTION COSTS	\$ 6,819,000

**APPENDIX A: PRELIMINARY TYPICAL SECTIONS AND (15%) PLAN & PROFILE FOR THE RECOMMENDED ALTERNATIVE**

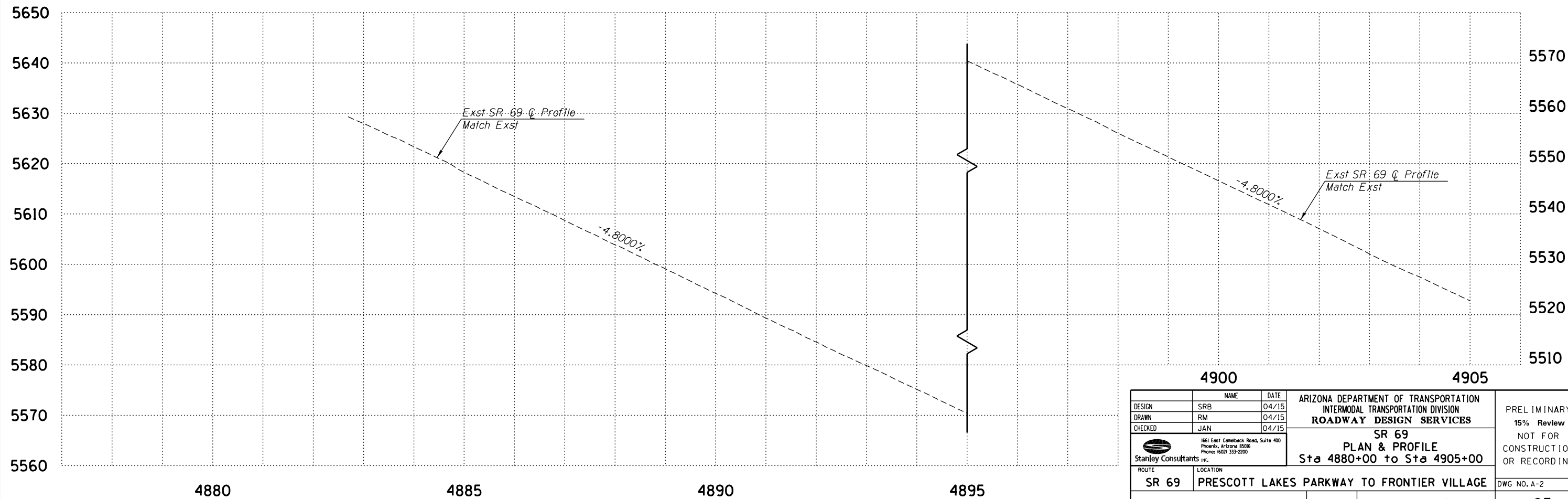
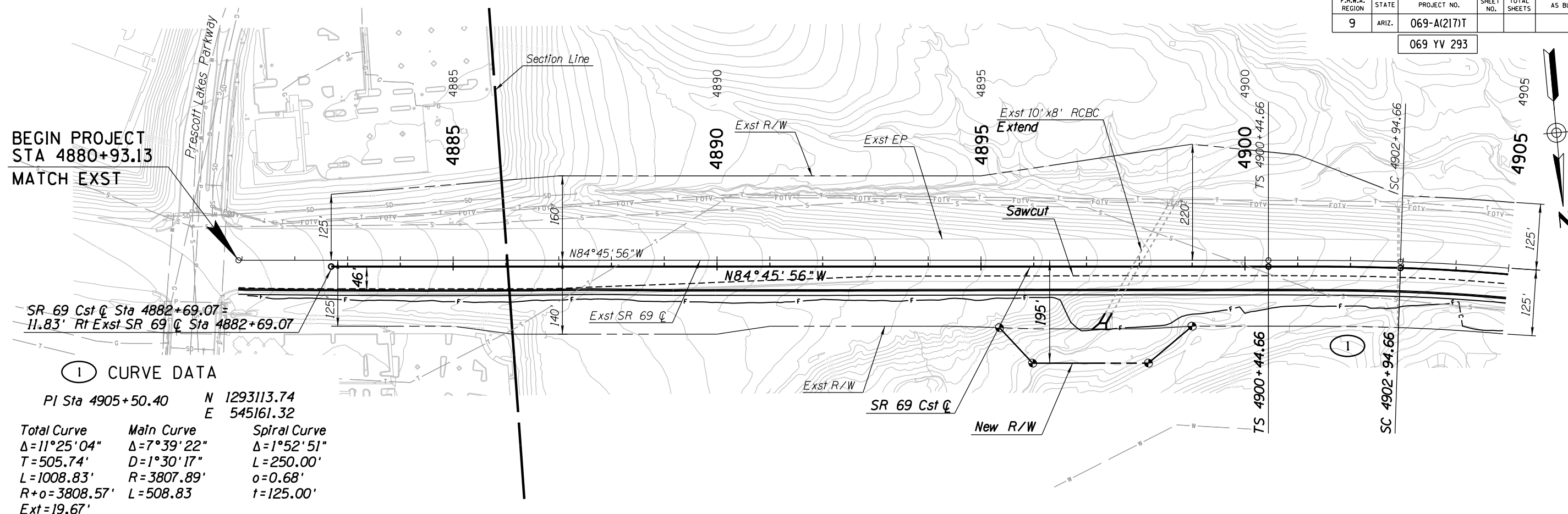







F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	069-A(217)T			

069 YV 293

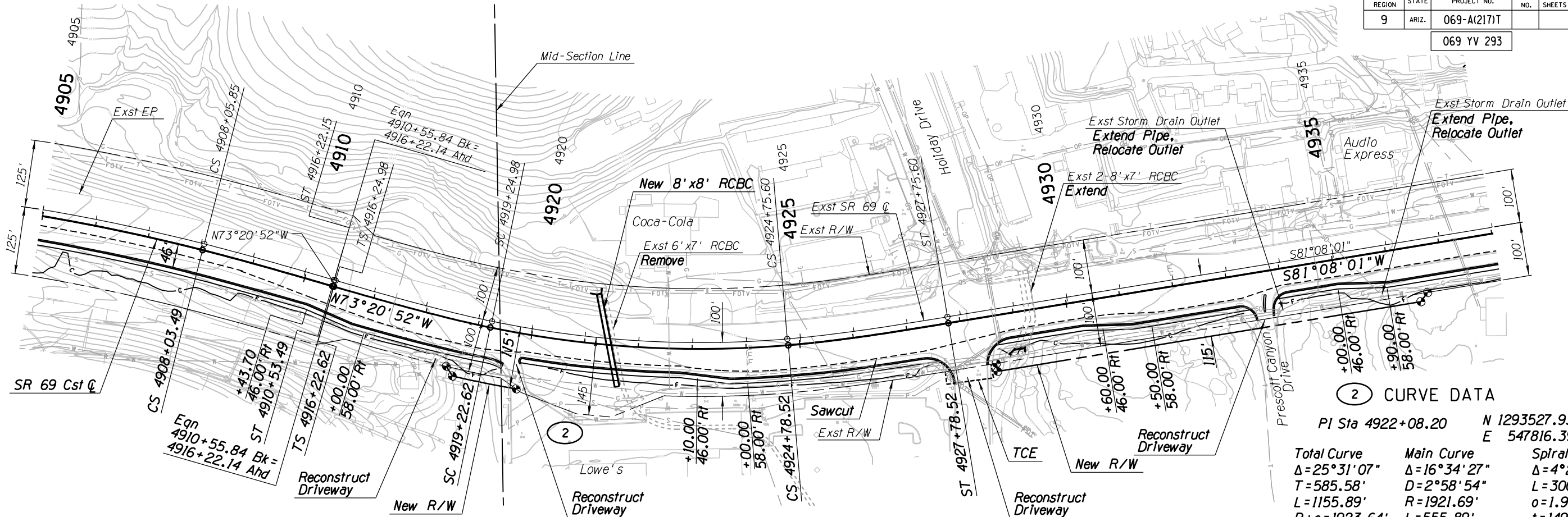


		NAME	DATE	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION <b>ROADWAY DESIGN SERVICES</b>  SR 69 <b>PLAN &amp; PROFILE</b> <b>Sta 4880+00 to Sta 4905+00</b>	PRELIMINARY  15% Review NOT FOR CONSTRUCTION OR RECORDING
DESIGN	SRB	04/15			
DRAWN	RM	04/15			
CHECKED	JAN	04/15			
 Stanley Consultants INC.		1661 East Camelback Road, Suite 400 Phoenix, Arizona 85016 Phone: 602/333-2200			
ROUTE		LOCATION			
SR 69		PRESCOTT LAKES PARKWAY TO FRONTIER VILLAGE			DWG NO. A-2
TRACS NO. H8739 OIL				069-A(217)T	___ OF ___

DATE: LOCATION: REVISIONS: FINISHED PLANS: SURVEY NO.

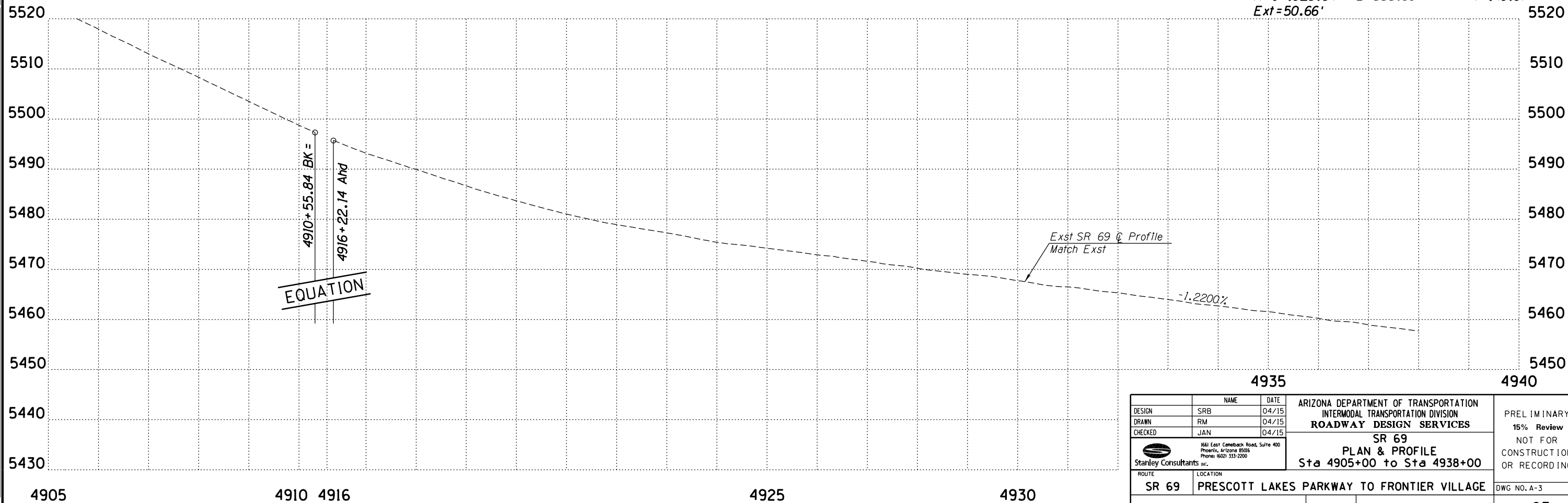
F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	069-A(217)T			

069 YV 293



2 CURVE DATA

PI Sta 4922+08.20	N 1293527.93	E 547816.39
Total Curve	Main Curve	Spiral Curve
$\Delta = 25^\circ 31' 07''$	$\Delta = 16^\circ 34' 27''$	$\Delta = 4^\circ 28' 20''$
$T = 585.58'$	$D = 2^\circ 58' 54''$	$L = 300.00'$
$L = 1155.89'$	$R = 1921.69'$	$\phi = 1.95'$
$R + \phi = 1923.64'$	$L = 555.89'$	$t = 149.97'$
$Ext = 50.66'$		

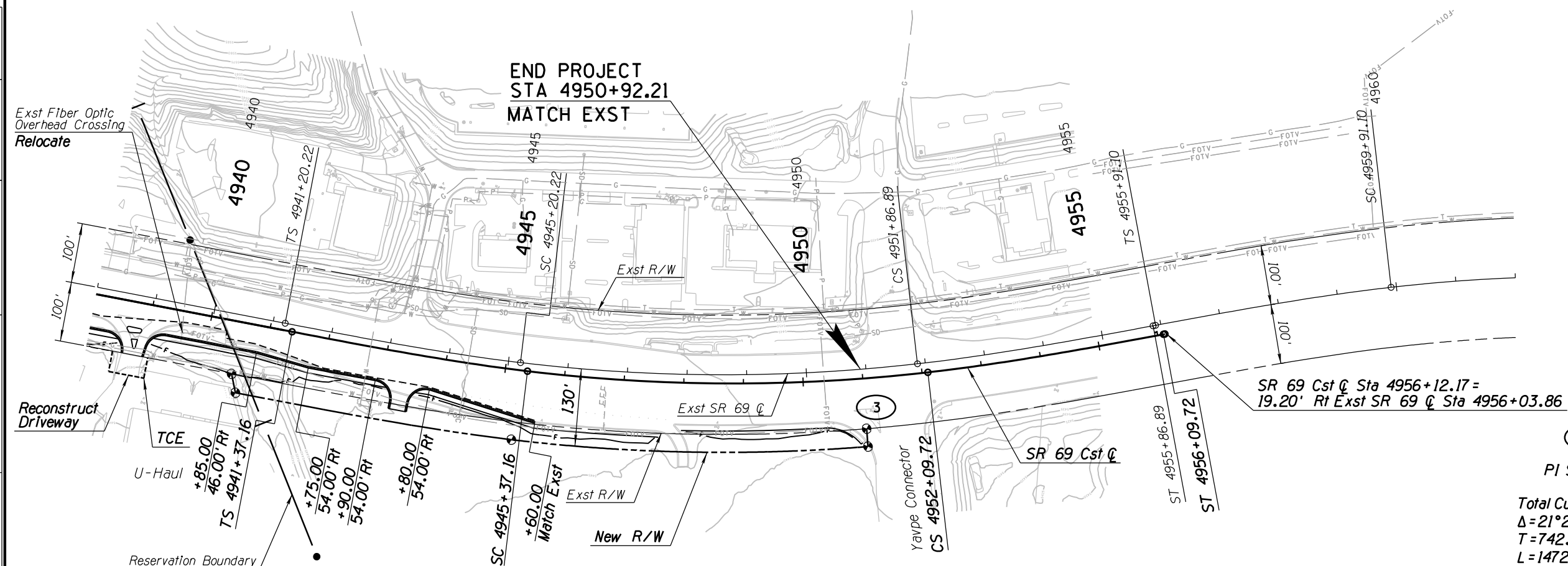


DESIGN	SRB	DATE	04/15	ARIZONA DEPARTMENT OF TRANSPORTATION INTERMODAL TRANSPORTATION DIVISION ROADWAY DESIGN SERVICES	PRELIMINARY 15% Review NOT FOR CONSTRUCTION OR RECORDING
DRAWN	RM	DATE	04/15		
CHECKED	JAN	DATE	04/15		
Stanley Consultants Inc. 1661 East Camelback Road, Suite 400 Phoenix, Arizona 85016 Phone: 602/333-2200				SR 69 PLAN & PROFILE Sta 4905+00 to Sta 4938+00	
ROUTE		LOCATION		DWG NO. A-3	
SR 69		PRESCOTT LAKES PARKWAY TO FRONTIER VILLAGE			
TRACS NO. H8739 OIL		069-A(217)T		OF	



F.H.W.A. REGION	STATE	PROJECT NO.	SHEET NO.	TOTAL SHEETS	AS BUILT
9	ARIZ.	069-A(217)T			

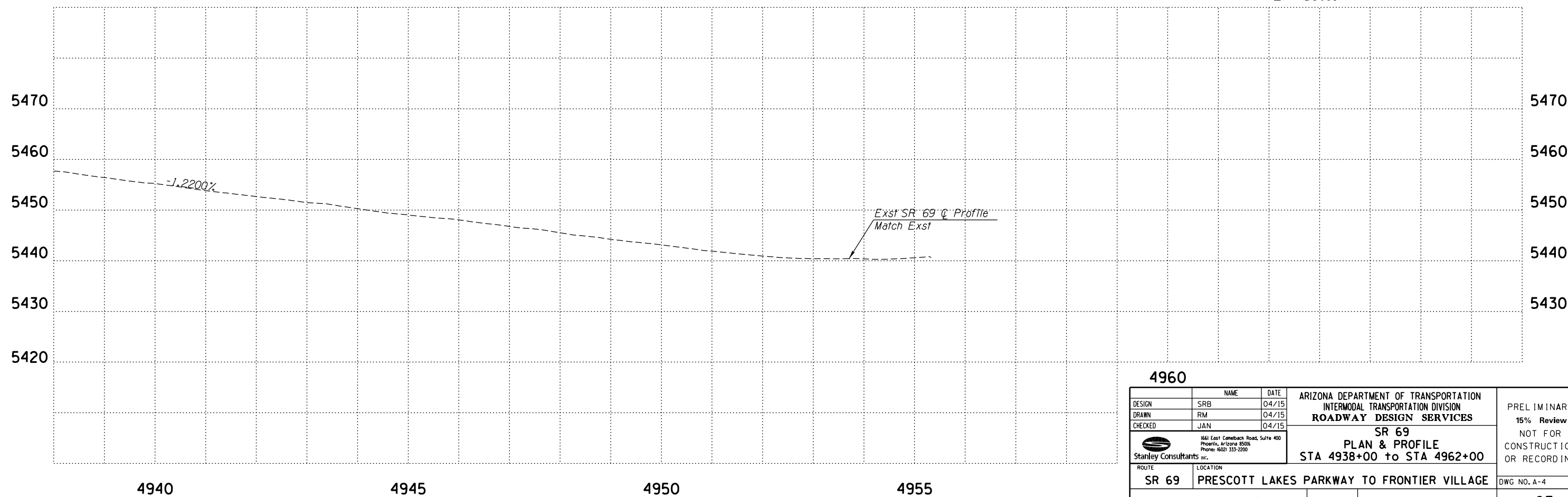
069 YV 293




3 CURVE DATA

Pl Sta 4948+80.13      N 1293214.38  
E 548864.66

Total Curve	Main Curve	Spiral Curve
$\Delta = 21^\circ 20' 00''$	$\Delta = 13^\circ 22' 38''$	$\Delta = 3^\circ 58' 41''$
$T = 742.97'$	$D = 1^\circ 59' 20''$	$L = 400.00'$
$L = 1472.56'$	$R = 2880.62'$	$e = 2.31'$
$R + e = 2882.93'$	$L = 672.56'$	$t = 199.97'$
$Ext = 53.01'$		



4960

<div> <div>DESIGN</div> <div>SRB</div> <div>04/15</div> </div>		<div> <div>NAME</div> <div>DATE</div> </div>		<div> <div>ARIZONA DEPARTMENT OF TRANSPORTATION</div> <div>INTERMODAL TRANSPORTATION DIVISION</div> <div>ROADWAY DESIGN SERVICES</div> <div>SR 69</div> <div>PLAN &amp; PROFILE</div> <div>STA 4938+00 to STA 4962+00</div> </div>	<div> <div>PRELIMINARY</div> <div>15% Review</div> <div>NOT FOR CONSTRUCTION OR RECORDING</div> </div>
<div> <div>DRAWN</div> <div>RM</div> <div>04/15</div> </div>		<div> <div>CHECKED</div> <div>JAN</div> <div>04/15</div> </div>			
<div>  <div> <div>1661 East Camelback Road, Suite 400</div> <div>Phoenix, Arizona 85016</div> <div>Phone: (602) 333-2200</div> </div> </div>		<div> <div>STANLEY CONSULTANTS INC.</div> <div>ROUTE</div> <div>LOCATION</div> </div>			
<div>SR 69</div>		<div>PRESCOTT LAKES PARKWAY TO FRONTIER VILLAGE</div>			
<div>TRACS NO. H8739 OIL</div>		<div>069-A(217)T</div>		<div>DWG NO. A-4</div> <div>OF</div>	

**APPENDIX B: AASHTO CONTROLLING DESIGN CRITERIA REPORT**



ADOT PROJECT NO. 069 YV 293 H8739 01L  
FEDERAL PROJECT NO. 069-A(217)T  
MP 293.8 – MP 294.8  
CORDES JUNCTION - PRESCOTT HIGHWAY  
SR 69

**AASHTO CONTROLLING DESIGN CRITERIA REPORT**

SEPTEMBER 2014

PREPARED FOR:  


ARIZONA DEPARTMENT OF TRANSPORTATION  
INTERMODAL TRANSPORTATION DIVISION  
STATEWIDE PROJECT MANAGEMENT GROUP

PREPARED BY:  


STANLEY CONSULTANTS, INC.  
1661 EAST CAMELBACK ROAD, SUITE 400  
PHOENIX, ARIZONA 85016

SR 69, MP 293.8 to MP 294.8  
AASHTO Controlling Design Criteria Report

ADOT Project No. 069 YV 293 H8739 01L  
Federal Project No. 069-A(217)T

**TABLE OF CONTENTS**

Summary of Non-Conforming Design Features..... ii  
Appendix A – Summary of AASHTO Controlling Design Criteria ..... 1



SUMMARY OF NON-CONFORMING DESIGN FEATURES

Project 069 YV 293 H8739 01L is a capacity improvement project on SR 69 in the eastern part of the City of Prescott in Yavapai County, Arizona. The purpose of this project is to improve traffic operations. The SR 69 cross sections west and east of the project limits consist of six lanes. SR 69 within the project limits contains two lanes in each direction with a continuous two-way left-turn lane and right-turn lanes at major driveways and intersections. The existing cross section within the project limits will be widened to six lanes.

Existing design features were evaluated against the current minimum values stated in AASHTO's *A Policy on Geometric Design of Highways and Streets* (2011). The following are existing design features requiring design exceptions. All other non-conforming design features that were identified will be upgraded as part of this project.

The superelevation rate is less than the recommended minimum for a posted speed of 45 mph as follows:

Beginning MP 294.42 (HPI Sta 4922+07.18)  
e existing = 0.040 ft/ft (0.005 ft/ft less than the recommended of 0.045 ft/ft)  
e minimum Method 2 = -0.079 ft/ft    Method 2 Speed 65 mph

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA  
MAINLINE SUMMARY (UNDIVIDED)

PROJECT NUMBER: 069 YV 293 H8739 01L ROUTE: SR 69  
PROJECT LOCATION: PRESCOTT LAKES PARKWAY TO FRONTIER VILLAGE BEGINNING MP: 293.80  
HIGHWAY SECTION: CORDS JCT-PRESCOTT HWY ENDING MP: 294.80  
FUNCTIONAL CLASSIFICATION: PRINCIPAL ARTERIAL

TRAFFIC VOLUMES AND FACTORS: CURRENT YEAR 2011 AADT (VPD) 37,125<sup>1</sup> DESIGN YEAR 2040 AADT (VPD) 67,876<sup>2</sup> TRAFFIC FACTORS K= 9%<sup>1</sup> D= 60%<sup>1</sup> T= 12%<sup>1</sup>

THE POSTED SPEED LIMIT IS: 45 MPH TERRAIN IS: ROLLING AVERAGE ELEVATION IS: 5,500

LANE AND SHOULDER WIDTH:	EXISTING (FT)	AASHTO RECOMMENDED MINIMUM (FT)
TRAVELED WAY WIDTH:	48	24
CONTINUOUS TWO-WAY LEFT TURN:	12	11
SHOULDER WIDTH:	8	8

VPI STATION	MILEPOST BEGIN	MILEPOST END	APPROACH GRADE (%)	DEPARTURE GRADE (%)	LENGTH OF CURVE (FT)	STOPPING SIGHT DISTANCE EXISTING (FT)	STOPPING SIGHT DISTANCE REQUIRED (FT)	EXISTING SPEED (MPH)	POSTED SPEED (MPH)
4872+00.00	293.36	293.81	3.72	-4.8	2400	780	391	69	45
4910+55.84	294.29	294.44	-4.8	-3.67	200	+9999	391	+100	45
4921+11.07	294.44	294.59	-3.67	-1.22	777.86	1647	382	+100	45

REMARKS:  
<sup>1</sup> Based on 2011 ADOT State Highway Traffic Log  
<sup>2</sup> Based on 2030 ADOT 20 Year Traffic Projections x 1.029% average annual growth rate  
\* Design exception required but not requested since the existing shoulder width will be brought up to AASHTO standards with this project.

SUMMARY OF AASHTO CONTROLLING DESIGN CRITERIA

MAINLINE SUMMARY (UNDIVIDED)

(CONTINUED)

HORIZONTAL ALIGNMENT AND STOPPING SIGHT DISTANCE:

HPI STATION	MILEPOST BEGIN	MILEPOST END	RDG MAX (F/T/FT)	SUPERELEVATION EXISTING (F/T/FT)	MINIMUM (F/T/FT)	METHOD 2 SPEED (MPH)	POSTED SPEED (MPH)	EXISTING DEGREE OF CURVE	MAXIMUM DEGREE OF CURVE	EXISTING HSO (FT)	EXISTING GRADE (%)	HORIZONTAL SSD EXISTING (FT)	HORIZONTAL SSD REQUIRED (FT)
4875+82.23	293.52	293.79	0.08	0.067	0.045	69	45	3'00'00"	9'46"	N/A	N/A		
4905+51.58	294.12	294.31	0.08	0.040	0.025	82	45	1'30'00"	9'46"	N/A	N/A		
4922+07.18	294.42	294.64	0.08	0.040**	0.045	65	45	3'00'00"	9'46"	N/A	N/A		

GRADES:

	BEGIN MP	END MP	TERRAIN	EXISTING MAXIMUM GRADE	POSTED SPEED	AASHTO MAXIMUM ALLOWABLE GRADE
SOUTHBOUND	293.80	294.80	ROLLING	4.8000%	45	7.0000%
NORTHBOUND	294.80	293.80	ROLLING	-4.8000%	45	7.0000%

CROSS SLOPE:

EXISTING CROSS SLOPE IS: 2.0%

AASHTO RANGE IS: 1.5 - 2.0%

VERTICAL CLEARANCE:

STRUCTURE	MILEPOST	PRECONSTRUCTION CLEARANCE	POST CONSTRUCTION CLEARANCE	MINIMUM CLEARANCE
			NONE	

STRUCTURES:

STRUCTURE	MILEPOST	EXISTING BRIDGE LENGTH	EXISTING BRIDGE WIDTH	RECOMMENDED BRIDGE WIDTH	BRIDGE BARRIER GEOMETRY	BRIDGE BARRIER STRUCTURAL ADEQUATE	EXISTING STRUCTURE CAPACITY	RECOMMENDED STRUCTURE CAPACITY
								NONE

REMARKS:

\*\* Design exception required

2



**APPENDIX C: AGENCY COORDINATION**





State Route 69 Widening, Prescott Lakes Parkway to Frontier Village  
Scoping Distribution List

To Receive Individual Letter						
Attribution	M	First	Last	Title	Agency	AI
Floodplain	Mr.	Dan	Cherry	Director	Yavapai County Regional Flood Control District	1120 Commerce Drive
Biography	Mr.	Cheri A.	Butcher	Transportation Project Evaluation Specialist	Arizona Game and Fish Department, WMHB-Project Evaluation Program	9000 W. Carefree Highway
YPIT	Mr.	Steve	Spangle	Field Supervisor	US Fish and Wildlife Service	2321 W. Royal Palm Road, Suite 103
BIA	Mr.	Peter	Bourgeois	Planner	Yavapai-Prescott Indian Tribe	530 E. Merritt St.
	Mr.	Clay	Lewis	Environmental Protection Specialist	US Bureau of Indian Affairs Western Regional Office	2600 N. Central Ave.
To Receive Mail Merge Letter						
Attribution	M	First	Last	Title	Agency	AI
City of Prescott	Mr.	Craig	McConnell	City Manager	City of Prescott	201 S. Cortez St.
City of Prescott	Mr.	Henry	Hash	Director	City of Prescott Public Works Department	493 N. Virginia St.
City of Prescott	Mr.	Dennis	Light	Fire Chief	City of Prescott Fire Department	1700 Iron Springs Road
City of Prescott	Mr.	Jerald	Monahan	Police Chief	City of Prescott Police Department	222 S. Marina St.
Yavapai County	Mr.	Bryon	Jaspers	Director	Yavapai County Public Works Department	1100 Commerce Drive
Yavapai County	Mr.	Steven	Mark	Director	Yavapai County Development Services	1120 Commerce Drive
Yavapai County	Mr.	Phil	Bourdon	County Administrator	Yavapai County	1015 Fair St.
Yavapai County	Mr.	Scott	Mascher	Sheriff	Yavapai County	255 E. Oakley St.
State of Arizona	Mr.	Danny	Golden	Commander	Arizona Department of Public Safety, District 12	1111 Commerce Drive
State of Arizona	Mr.	Roben	Ojeda	Manager, Right-of-Way Section	Arizona State Land Department	1616 W. Adams St.
State of Arizona	Mr.	Gordon	Taylor	Manager, Planning Section	Arizona State Land Department	1616 W. Adams St.
State of Arizona	Mr.	Mark	Eddman	Manager, Engineering Section	Arizona State Land Department	1616 W. Adams St.
MPO	Mr.	Chris	Bridges	Administrator	Central Yavapai Metropolitan Planning Organization	1971 Commerce Center Circle, Suite E
Hospital	Mr.	Jill	Johnson	Director of Facilities Development	Yavapai Regional Medical Center-West	1003 Willow Creek Road
School	Mr.	Dave	Smucker	Superintendent	Prescott Unified School District	145 S. Granite St.
Environmental	Mr.	Jay	Linsinger	Ecologist	Center for Biological Diversity	P.O. Box 1178
Environmental	Ms.	Jance	Przybyl	Wildlife Linkages Program Coordinator	Sky Island Alliance	P.O. Box 41165



Janice K. Brewer, Governor  
John S. Hallikowski, Director  
Jennifer Toth, State Engineer  
Robert Samour, Senior Deputy State Engineer, Operations  
Dallas Hammit, Senior Deputy State Engineer, Development

October 31, 2014

«M» «First» «Last»  
«Title»  
«Agency»  
«A1»  
«City», «ST» «ZIP»

RE: 069-A(217)T  
069 YV 293 H8739 01L  
State Route 69 Widening, Prescott Lakes Parkway to Frontier Village

Dear «M» «Last»:

The Arizona Department of Transportation (ADOT), in coordination with the Federal Highway Administration, is conducting a feasibility study for a roadway widening and traffic operation improvement project on State Route (SR) 69 from milepost (MP) 293.8 to MP 294.8 in the city of Prescott in Yavapai County, Arizona (Figure 1–Project location and Figure 2–Project vicinity). The feasibility study will develop and evaluate various alternatives for widening SR 69 and identify a final preferred alternative. Adjacent lands are owned by or are under the jurisdiction of the City of Prescott, the Arizona State Land Department, the Yavapai-Prescott Indian Tribe, and private parties. This letter is a request for comments, concerns, or issues relevant to the improvement project.

Within the project limits, SR 69 consists of two through lanes in each direction and a center left-turn lane, and variable widths of paved shoulders on both sides of the roadway. Dedicated right-turn lanes are present on SR 69 at the signalized intersections with Holiday Drive and Prescott Lakes Parkway. Several additional dedicated right-turn lanes provide access to commercial and residential driveways and side streets. Because SR 69 widens to six through lanes beyond the project limits, the four-through-lane section within the project limits creates a bottleneck in traffic flow that would be alleviated by widening SR 69 to six through lanes.

The primary components of the scope of work to be considered in the feasibility study consist of:

- Widening approximately 1.0 mile of SR 69 to six lanes from four lanes to match existing conditions at both ends of the project limits
- Reconstructing driveways and access to side streets, as needed
- Installing signage and striping, as needed

ARIZONA DEPARTMENT OF TRANSPORTATION  
206 S. 17th Ave. | Phoenix, AZ 85007 | azdot.gov

«Last»

069 YV 293 H8739 01L

October 31, 2014

Page 2 of 2

This project is not programmed for construction at this time. The results of the feasibility study will assist ADOT and the City of Prescott in determining how best to proceed with the project into the programming and design phases. A public meeting to discuss the project is tentatively scheduled for spring 2015. New right-of-way or easements may be required to accommodate additional lanes and to extend existing culverts for a wider roadway.

Please identify any issues or concerns you have regarding this project by December 1, 2014, and contact Michael R. Dawson via email at [mdawson@ecoplanaz.com](mailto:mdawson@ecoplanaz.com); by phone at 480.733.6666, ext. 177; by fax at 480.383.6915; or mail them to:

Arizona Department of Transportation  
c/o Michael R. Dawson  
EcoPlan Associates, Inc.  
701 W. Southern Ave., Suite 203  
Mesa, AZ 85210

Thank you for your time and assistance.

Sincerely,



Mustafa Muradvich  
ADOT Environmental Planning Group

Enclosures: Figure 1 and Figure 2

c: Michael R. Dawson, EcoPlan Associates, Inc.

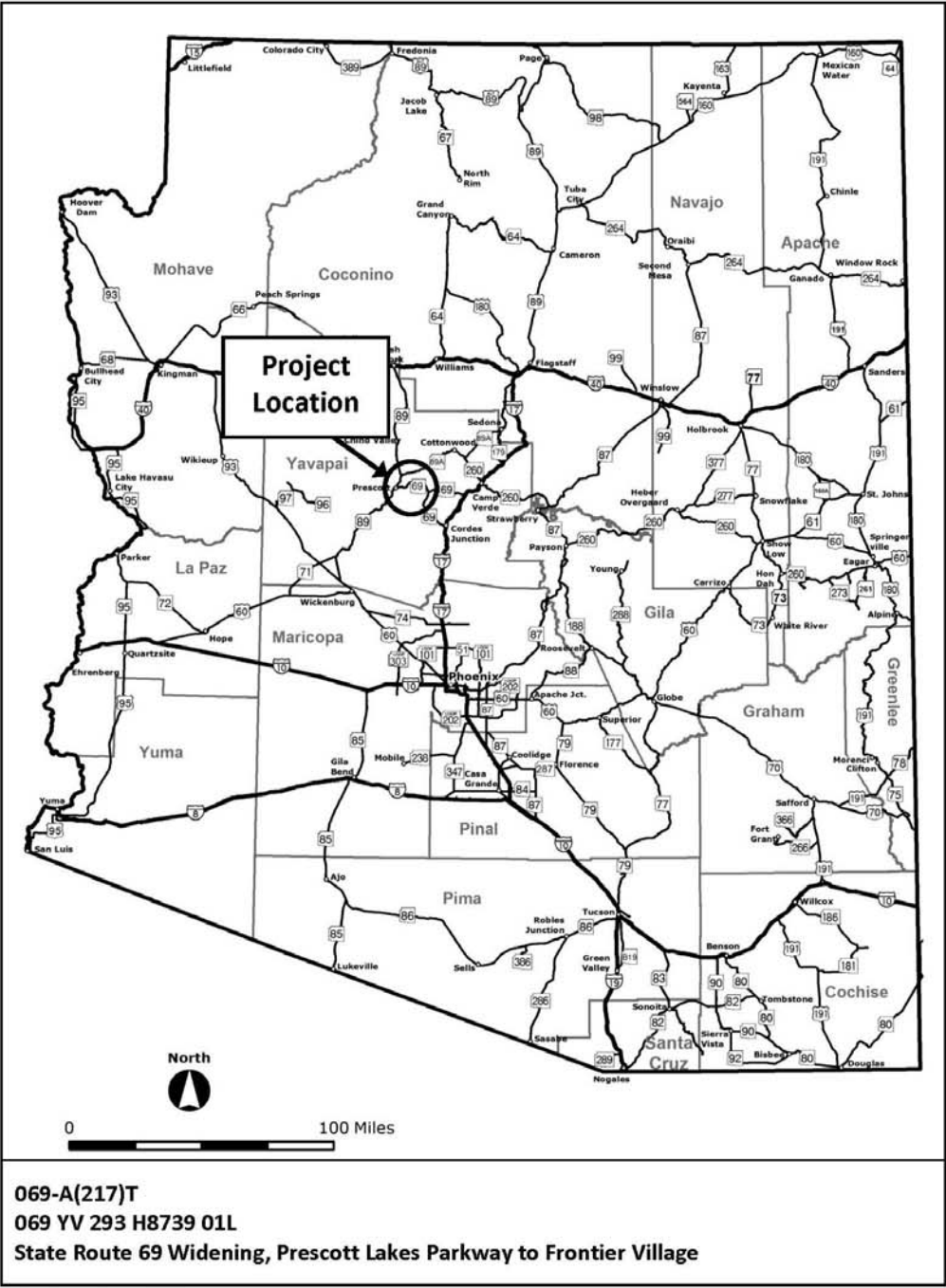
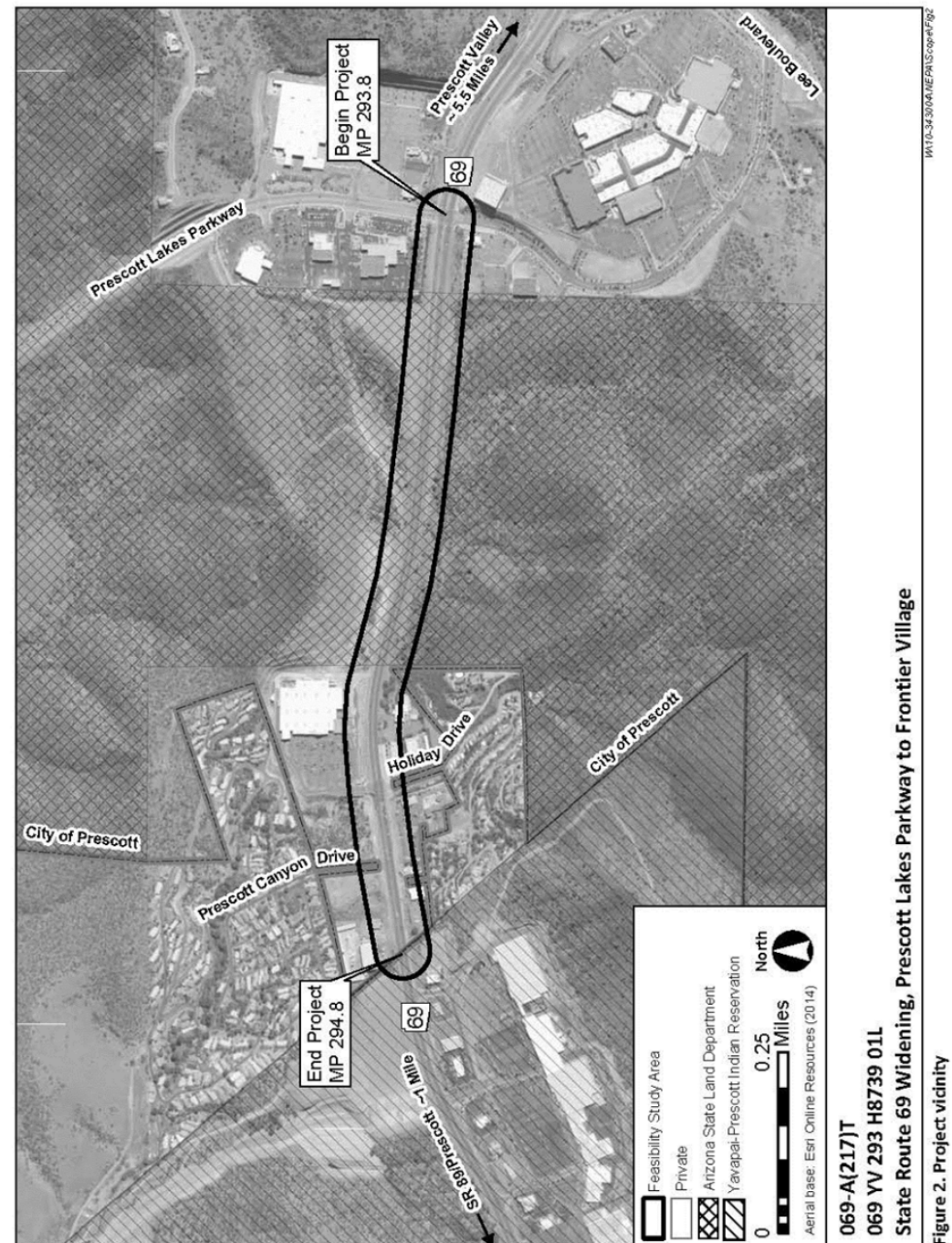


Figure 1. Project location





THE STATE OF ARIZONA  
**GAME AND FISH DEPARTMENT**

5000 W. CAREFREE HIGHWAY  
PHOENIX, AZ 85086-5000  
(602) 942-3000 • WWW.AZGFD.GOV



**GOVERNOR**  
JANICE K. BREWER  
**COMMISSIONERS**  
CHAIRMAN, ROBERT E. MANSELL, WINSLOW  
KURT R. DAVIS, PHOENIX  
EDWARD "PAT" MADDEN, FLAGSTAFF  
JAMES R. AMMONS, YUMA  
J.W. HARRIS, TUCSON  
**DIRECTOR**  
LARRY D. VOYLES  
**DEPUTY DIRECTOR**  
TY E. GRAY

December 5, 2014

Arizona Department of Transportation  
Mr. Michael Dawson  
EcoPlan Associates, Inc.  
701 W. Southern Ave., Suite 203  
Mesa, AZ 85210

Re: Review of the Widening of State Route 69: 069-A(217)T; 069 YV 293 H8739 01L

Dear Mr. Dawson:

The Arizona Game and Fish Department (Department) received your Project Evaluation Request letter dated October 30, 2014, regarding the widening of State Route 69 from Prescott Lakes Parkway to Frontier Village in Yavapai County, AZ. As seen on the Department's Heritage Data Management System (HDMS)'s On-Line Environmental Tool report you generated on September 12, 2014, golden eagles (*Aquila chrysaetos*), a special status species, the yellow-billed cuckoo (*Coccyzus americanus*), which is a species federally proposed as Threatened under the Endangered Species Act (ESA), and a Designated Critical Habitat for the Mexican spotted owl (*Strix occidentalis lucida*), have been reported within a three mile radius of your proposed project.

Based on the information provided, the Department has the following general recommendations:

- Golden eagles are regulated under the Bald and Golden Eagle Protection Act (BGEPA). If you are uncertain about the effects of your project to eagles, or if you anticipate your project will not be in compliance with the Eagle Act, the Department recommends you contact the U.S. Fish and Wildlife Service (USFWS) for their Technical Assistance. The USFWS will provide options to comply with the Eagle Act, such as conservation measures to avoid or minimize adverse effects to the eagles.
- The yellow-billed cuckoo and Critical Habitat for Mexican spotted owl have been recorded with a three mile radius of your proposed project. If you are uncertain about the effects of your project to the yellow-billed cuckoo or Critical Habitat for the Mexican spotted owl, or if you anticipate your project will not be in compliance with the ESA, the Department recommends that you and/or the project proponent contact the U.S. Fish and Wildlife Service (USFWS) for their Technical Assistance. The USFWS will provide options to comply with the ESA, such as conservation measures to avoid or minimize adverse effects to listed species.

AN EQUAL OPPORTUNITY REASONABLE ACCOMMODATIONS AGENCY



Mr. Michael Dawson  
December 5, 2014  
2

- Minimize impacts to vegetation during project construction. Staging areas should be located in previously disturbed sites, and kept as small as possible. Implement erosion and drainage control measures during the project to prevent the introduction of sediment-laden runoff into adjacent surface waters, and to prevent impacts to surface water quality. Stabilize exposed soils, particularly on slopes, with native vegetation as soon as possible to prevent excess erosion.
- If proposed ground disturbance (both temporary and permanent), in areas with native vegetation, will meet or exceed 0.25 acre, please comply with the Arizona Native Plant Law (<https://agriculture.az.gov/programs-and-services/native-plants>) regulations. Please determine if a Native Plant Inventory should be conducted to identify, record, and coordinate plant salvage efforts for species that are Protected under the Arizona Native Plant Law. In addition, the applicable land management agencies should be consulted regarding guidelines for revegetation efforts.
- Pronghorn and other wildlife species are known to move through the vicinity. All right-of-way fencing along the roadway should be wildlife friendly, with a maximum fence height of 42-inches for the top wire, and a minimum of 12-inches between the top two wires. The bottom wire should be smooth (un-barbed), and minimum height of 18-inches from the ground. Please refer to the Department's Fencing Guidelines. <http://www.azgfd.gov/hgis/guidelines.aspx>

The Department appreciates the opportunity to provide an evaluation of impacts to wildlife or wildlife habitats associated with the Widening of State Route 69. If you have any questions regarding this letter, please contact me at (623) 236-7615, and visit our website for additional guidelines at <http://www.azgfd.gov/hgis/guidelines.aspx>.

Sincerely,



Cheri A. Bouchér  
Project Evaluation Program Specialist, Habitat Branch  
Arizona Game and Fish Department

cc: Laura Canaca, Project Evaluation Program Supervisor  
Trevor Buhr, Habitat Program Manager, Region III  
Joshua Fife, ADOT Biologist

AGFD# M14-11030451

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**From:** Light,Dennis [<mailto:dennis.light@prescott-az.gov>]  
**Sent:** Friday, November 07, 2014 11:02 AM  
**To:** Mike Dawson  
**Subject:** RE: 069 YV H739-001 Prescott Lakes Pwy to Frontier Village

Good Morning Michael,

We have received and have few exceptions with the work being studied to occur in our jurisdiction.

All we ask is that construction techniques employed allow for un-fettered access to the commercial corridor properties by emergency response vehicles and that all materials used in the project meet minimum, city accepted standards.

Thanks for engaging us prior to moving forward.

Sincerely,

**Dennis B. Light**  
Fire Chief



1700 Iron Springs Road | Prescott, AZ 86305  
Ph: 928-777-1700 | Fax: 928-776-1890 | TDD: 928-445-6811  
[dennis.light@prescott-az.gov](mailto:dennis.light@prescott-az.gov)

**From:** Dan Cherry [mailto:Dan.Cherry@yavapai.us]  
**Sent:** Tuesday, November 04, 2014 4:39 PM  
**To:** Mike Dawson  
**Subject:** ADOT State Route 69 Widening, Prescott lakes Parkway to Frontier Village

Mr. Dawson,

I recently received a letter from Mustafa Muradvich with the ADOT Environmental Planning Group concerning the referenced project, seeking comments that be forwarded to you. I have reviewed the proposal as outlined in the letter and have no objections to the project, however it should be noted that the project lies completely within the incorporated boundaries of the City of Prescott. The City is not dependent on the Yavapai County Flood Control District regarding regulation of mapped special flood hazard areas and other watercourses, and thus addresses these matters with their own City staff. It is the recommendation of the Flood Control District that the City be consulted regarding any requirements or comments relating to drainage and floodplains within this project scope. As indicated would be done in the letter, the Yavapai County Flood Control District does appreciate being included on future mailings of the preliminary design plans, but I do not anticipate providing any detailed comments in the future.

Thank you for the opportunity to review the proposal. Please let me know if there are any further questions.

Dan



### Record of Conversation

**Date:** December 11, 2014  
**Time:** 9:30am  
**Federal Number:** 069-A(217)T  
**ADOT Number:** 069 YV 293 H8739 01L  
**Project Name:** State Route 69 Widening, Prescott Lakes Parkway to Frontier Village  
**Contact Initiator:** Mike Dawson of EcoPlan  
**Contact Recipient:** Chip Lewis of BIA Western Regional Office  
**Copy:** Mustafa Muradvich - ADOT EPG, Vivian Li - ADOT SPM, Jackie Noblitt - Stanley Consultants  
**Regarding:** Potential Right-of-Way from YPIT

#### Conversation Summary

The December 9, 2014 Project Progress Meeting raised the potential for the acquisition of Right-of-Way (ROW) from the Yavapai-Prescott Indian Tribe (YPIT) for the purpose of a future multi-use path. This ROW action would require the Bureau of Indian Affairs to grant ROW to ADOT, thus compliance with the National Environmental Policy Act process would be needed.

Chip Lewis, Environmental Protection Specialist – BIA Western Regional Office Transportation Division confirmed the process as Mr. Dawson noted during the Progress Meeting. The BIA would agree to FHWA as the lead federal agency and accept their NEPA documentation. The ROW action for a multi-use path would not trigger an Environmental Assessment for the BIA, thus if ADOT/FHWA determined a Categorical Exclusion meet FHWA needs, the BIA would agree.

If an Environmental Assessment (EA) was prepared for other reasons (i.e. public controversy or major ROW action outside YPIT boundaries) the BIA would not need to be a formal cooperating agency but would provide EA review.

Mr. Lewis also noted there is an option of a Temporary Construction Easement if YPIT elected to not grant ROW and instead operate and maintain the path on their land outside of the State Route 69 ROW.

#### Action Items

- Keep BIA informed as the project moves from the Feasibility Study to the programming and design phase.



## MEMORANDUM

TO: Vivian Li, ADOT Statewide Project Management  
Mustafa Muradvich, ADOT Environmental Planning Group  
Jackie Noblitt, Stanley Consultants

FROM: Norris Dodd, Wildlife Connectivity Program Coordinator, ADOT Environmental Planning Group

CC: Justin White, ADOT Environmental Planning Group  
Chuck Budinger, ADOT Prescott District  
John Fought, ADOT Prescott District

DATE: September 16, 2014

RE: State Route 69 Widening, Prescott Lakes Parkway to Frontier Village;  
TRACS No. 069 YV 293 H8739 01L; Wildlife-Related Issues

This proposed widening project, located between MP 293.8 and MP 294.8, lies within a semi-urban setting at the eastern reaches of the City of Prescott. The area exhibits considerable undeveloped, existing open space (Figure 1) interspersed with commercial development adjacent to SR 69. This existing 4-lane stretch of SR 69 is considered a “bottleneck” to traffic coming from either direction where the highway is already 6 lanes wide. The project feasibility report will address widening this stretch of SR 69 to 6 lanes.



*Figure 1.* Open space habitat on the south side of SR 69. Photo was taken from the highway looking to the SW. Such undeveloped habitat supports mule deer and other wildlife species.

Due to the considerable open space adjacent to the project stretch, this area supports a substantial mule deer population along with other wildlife species including javelina, coyote, mountain lion, bobcat, fox, etc. Slaughterhouse Gulch and associated riparian habitat runs

parallel to the highway, crossing under the highway at MP 294.1 and MP 294.4. The project stretch falls within one of the 152 statewide linkages (Linkage 35; East–West Prescott National Forest) identified in the 2006 *Arizona’s Wildlife Linkage Assessment*.

### Wildlife-Vehicle Collision Patterns

ADOT’s Environmental Planning Group recently completed a 10-year statewide analysis of wildlife-vehicle collisions (WVC), and analyzed 323,324 crashes along a total of 6,482 miles of 119 ADOT system highways; 9,242 of the crashes involved wildlife (2.9%). The highways with the highest average WVC incidence across all 1-mile segments were SR 260 (0.73 WVC/mile/year), SR 64 (0.70), SR 69 (0.52), and I-17 (0.48). We aggregated 1-mile segments into 5-mile segments to assess both the annual incidence and proportion of all crashes that involved wildlife; we assessed 1,410 total 5-mile segments statewide, of which 895 (63.5%) exhibited WVC for the 10-year period 2004-2013.

Along SR 69, only a single 5-mile segment exhibited either “high” or “very high” category WVC incidence or proportion of all crashes: **MP 290-295**, which encompasses the project limits. In fact, among all 895 statewide segments with WVC, the average annual incidence of WVC (1.8 WVC/mile/year) for this SR 69 segment tied for the 7<sup>th</sup> highest (the highest was 2.7 WVC/mile/year; SR 64). In comparison, this WVC incidence was 4.5 times the statewide average of 0.4 WVC/mile/year for all segments with WVC. While ADOT’s crash database does not include wildlife species, it is assumed that the majority of the SR 69 WVC involves mule deer. Thus, there is an opportunity to proactively address the incidence of WVC along this stretch as part of this widening project.

For the proportion of all crashes along SR 69 MP 290-295 involving wildlife, the 10-year average was quite low, 6.7%. This no doubt reflects the stretch’s high traffic volume, semi-urban setting, and much greater contribution to crashes attributable to those at occurring at intersections, during left turns from commercial developments, etc.

### Recommendations

Within the general scope of the proposed widening project, there are a range of measures that may be undertaken to address WVC incidence and to help promote connectivity within this identified wildlife linkage. These measures include:

#### 1) Signage

Given the documented high incidence of WVC along the entire 5-mile stretch between SR 69 MP 290-295, appropriate warning signage should be erected to alert motorists to the risk of WVC.

2) *Avoid or modify median barriers, if used*

With the limited roadway available to widen SR 69 within the project limits, much occurring atop fill slopes, consideration may be given to the use of median barriers such as the raised median with low walls used in the vicinity of SR 69 MP 291-292. Such barriers have the potential to entrap crossing mule deer and other animals and increase their exposure to vehicles, thus exacerbating the potential for WVC. As such, it is preferable to avoid utilizing such median barriers, if possible. If avoiding use of barriers is not possible, periodic breaks in the median barrier should be provided to allow for animal passage to help prevent entrapment on the roadway.

3) *Retrofit an existing drainage structure*

While there are existing concrete box culverts (CBC) that have little or no potential to accommodate wildlife passage within the project stretch (e.g., MP 294.4), the CBC located at MP 294.1 does exhibit some potential, albeit marginal (Figure 2). This single-barrel 8' (H) × 10' (W) CBC has good line-of-sight visibility through the structure. My field review conducted on September 9, 2014, following heavy rains the previous day discovered mule deer tracks at both approaches to this CBC. And while it is near universally recommended to have an *openness ratio* ( $W \times H / L$ ) higher than that associated with the CBC at MP 294.1 (ratio = 0.3) to promote mule deer passage, similar sized structures have been found to provide limited deer passage *with* barrier fencing.



Figure 2. Existing SR 69 concrete box culvert located at MP 294.1, through which mule deer passage can be increased with barrier/funnel fencing.

Ungulate barrier fencing that is anchored into commercial development at each end of the project stretch and ties into the walls of the CBC at MP 294.1 will accomplish two things. First, it will prevent deer and other animals from entering onto and crossing SR 69, thus preventing most WVC. Second, it will funnel animals to the CBC where they are presented to opportunity to cross below grade; while not ideal, this structure is anticipated to receive use by deer that likely will increase over time. It is also important

that the termination points for the fence are made securely into existing commercial development (e.g., anchoring it to walls, etc.) to prevent potential for wildlife “end runs.” To prevent the potential for deer readily jumping the fence, its height should be at least 6.5 feet on level ground; fencing of similar height will soon be constructed along SR 86 to funnel mule deer and other animals to two new underpasses.

Along most of the stretch, the fence could be located below highway grade on the existing fill slopes to reduce visual obtrusiveness; on such slopes, the fence height could actually be reduced as the slope contributes to functional barrier height such that a 42” fence on a 30% slope is effectively 62” high, and on a 40% slope the fence is effectively 68” high. It is anticipated that a total length of between 1.0-1.2 miles of ungulate fence is needed to retrofit the existing SR 69 CBC; at an estimated cost of \$20/LF, such fencing would cost approximately \$100,000-\$125,000, though this could be reduced using lower fence on fill slopes.